

OCCUPATIONAL HEALTH HAZARDS RELATED TO WEAVING

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ABSTRACT

Handloom weaving in India is an inherited art where weavers learn to weave from their ancestors and thus this craft is practiced widely in rural areas and is providing employment to a wide section of rural artisans. Despite of the fact that Indian handlooms have made a distinct place in globalised world, this sector has not attained proper awareness as far as weaving related health problems and perils are concerned. Several health hazards are associated with weaving and related activities which along with causing stress and strain to weavers pose certain health related risk factors to them. Thus present study was planned to identify the occupational health hazards allied to weaving and related activities so that several remedial measures may be suggested for the same.

KEYWORDS: Handloom, Occupational health hazards, Weaving.

INTRODUCTION

India has always been known for its splendid crafts and artmanship. Indian handlooms have created an aura among the people all over the world. Weaving is an art which has been known since ages and weavers pass this art to their generations as handlooms in India are mostly used at homes with weavers being assisted by their children and other family members. Thus it can be said that weaving is an inherited art in India and rural artisans adopt this art as an income generation activity. Though weaving industry provides employment to millions of people and thus makes itself the largest provider of rural work force, it has not been given due attention like other sectors in textile.

Weaving involves several activities right from raw material (yarn) collection to winding, denting and then continuously sitting in static posture to weave fabric. Thus, like other occupations weaving also involves certain risk factors which not only trim down efficiency and productivity but may also pose several health hazards thereby making the lives of weavers and their family members tougher. Hence, like other industrial sectors weaving segment also requires a work place surveillance program to assess the weaver's health conditions. A work place surveillance program is an ongoing systematic collection, analysis and interpretation of health and exposure data in the process of describing and monitoring occupational disease and cumulative trauma disorders. It can be used to determine when additional monitoring or evaluation such as ergonomic analysis or biological monitoring may be warranted. It may be further used to assist in establishing intervention priorities.

The purpose of the Occupational Health Surveillance Program is to help assure the health of employees who have workplace exposure to particular health hazards (e.g., fiber dust inhalation, high noise

levels, animal allergens) known to pose risk for a potentially serious health condition, illness, or injury; or who perform specific work tasks (e.g., respirator use, driving commercial vehicles) that require a certain degree of health and fitness to assure employee and/ or public health and safety.

MATERIALS AND METHODS

Thus keeping in mind the above factors, the present study was carried out to determine the health hazards related to weaving. The study was focused in Mahua Dabra village, near Jaspur (Distt. Udham Singh Nagar) for the reason that there is a cluster of weavers, who are basically Ansaris (a traditional community of Julahas/weavers). Data on general information of 70 weavers was collected through personal interview with the weavers.

Survey of the handloom weavers was done to assess their working conditions. It was found that all over Uttarakhand, respondents who were associated with weaving and related activities were facing lot of physical problems. Most of their problems could be easily sorted out through ergonomic assessment of task which they performed and suggest improvement in technique and technology involved in their work.

Handloom sector comprises of several activities like procurement of raw materials, bobbin winding, creeling of yarns, warping, drafting of warp, denting of warp and finally weaving of fabric. All these activities include certain risk factors i.e. awkward postures, forces, repetitive movements with inadequate rest. Presence of these factors may lead to decline in productivity, inferior quality of products, increased fatigue or stress to the weavers.

Therefore, in order to study health hazards associated with those activities still photography was done. The photographs were taken keeping the specific focus on postural details of weavers while doing handloom related activities, their environmental conditions and looms structures. All the three aspects of ergonomic were kept in mind i.e. man (weaver), machine (handloom) and their working environment. Close analysis of these photographs was done and observations were made.

RESULTS AND DISCUSSIONS

Starting from **raw material** used for weaving, it was found that weavers were using worn-out sweaters, and then they raveled yarns from those sweaters which they were using for warping purpose. These used sweaters are dirty and whole family members including the children of every age group did this work to collect raw material for weaving without using any mask.

For durrie making again, these weavers use torn strips of worn-out saris, dupatta etc. For winding of bobbin from these yarns, wool fiber dust is released and spread in to the atmosphere. Exposure to such contaminated fibers with biological agents such as bacteria and fungi may result in respiratory diseases and is a cause to concern. **Radjabi. (1983)** believed that anthrax infections caused by raw wool was a prevalent disease among weavers. Thus it can be said that weavers who deal with woolen yarns or who, unknowingly inhale fiber dust may be exposed to such health hazards.

In weaving, the **bobbin winding** section consumes less energy but more time, therefore mostly aged people do this work. The entire process takes place with the weaver seated on the floor in static postures for 4-6 hours without having support to their vertebral column. This again may lead to postural health hazards to these workers/weavers. **Mukhopadhyay (2008)**, from his ergonomic research on bangle manufacturing persons also concluded that during the manufacturing process of bangles workers seated on floor with their back unsupported leads to lumbar and static load on their back cause strain and injury of soft backbone tissues.

DRAFTING OF WARP YARNS

In handloom weaving is one of the most time consuming and tedious task. In this weaver has to pass every warp through the eye of heddle wire and therefore this activity needs lot of time for its completion. The weaver has no proper sitting place in handloom during drafting, this causes upper shoulder flexion and pressure on his neck and back. Poor lighting and continuous working for 5-8 hours cause strain in eyes and on his entire body parts.

After drafting, **procedure of denting** of warps (in which weavers has to pass warps from each fine wires of reed) also causes eye strain and upper arm postures to be deviated from neutral. **Radjabi (1983)**, reported that eyesight disorders are prevalent among weavers, because of eye strain and inadequate lighting.

During **weaving** weavers sit continuously on hard floor (pit loom) or hard wooden bench (in horizontal handloom) without back support (fig.1).



Fig.1 Stationary Sitting Arrangement in Looms without Backrest, Less Leg Space in

Pit Continuous Sitting Without Rest May Cause Backache/Stress/Fatigue

Some of their looms were having slant sitting arrangement with no cushion and back support, which was reported as uncomfortable by weavers (fig.2). It increases stress in their lower limbs, calf muscles and on the back.

**Fig.2**

While working on pit loom there was not enough depth for free leg movement in the pit which cause the weavers to work in a fixed leg postures for long duration which creates discomfort and stress in leg muscles and also in lower body parts.

Weavers used to weave in seated or standing position (fig-4 a, b) for long periods extending from 3 - 4 hours at a stretch. In the entire process the back or the vertebral column remains unsupported. It cause static load on forearm muscles and legs. In the entire weaving process shoulders are involved in repetitive movements without breaks for throwing shuttle and moving reed frames. This repetitive movement of hand increases the risk of neck, upper arm and shoulder musculoskeletal problem, as they are operating heavy reed frame continuously without taking adequate breaks for rest. During entire process weaver worked in awkward and constrained postures with cervical vertebrae in forward flexion. This may lead to long term health hazards. **Banerjee (2010)**, also reported that repetitive work engagement for long time would increase the intensity of the pain and would lead to repetitive strain injury.

**(a)****(b)**

Fig: 3, 4 Weaving Continuously in Same Posture may Cause Exertion and Stress in Legs and Upper Body

Choobineh et.al (2003) also reported that the heavy weight of reed and its repetitive application leads to upper limb disorder.

Visual assessment of the photographs taken to analyze the environmental conditions of weaver's show (fig. 5) that the surrounded area of their loom was very dirty. They use to sleep and eat in the same or adjoining room where their looms were kept. Their loom related accessories, bobbins, raw materials etc were not arranged in a proper manner. They don't clean their room and looms/machines regularly, therefore lots of fiber dust was observed near their loom. Part of their looms i.e. reed, heddle frames, wires etc. were full of fiber dust (fig. 5 b).

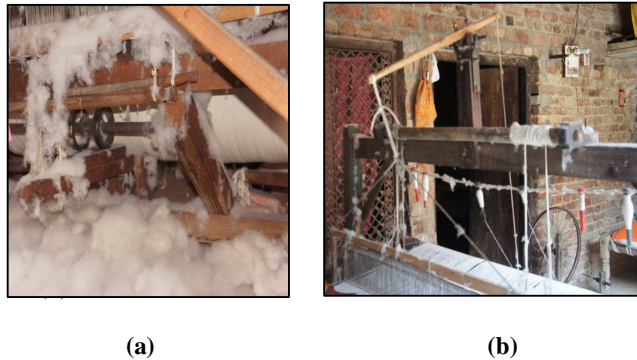


Fig: 5 Accumulation of Contaminated Fibers Dust in Handloom May Cause Lung Disease



Fig: 6 Poor Ventilation during Weaving May Cause Respiratory Problems

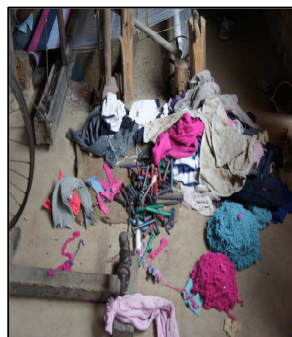


Fig: 7 Poor Hygiene Condition near Loom May Cause Several Health Problems

It was observed that in some of the houses ventilators were made but due to lack of cleaning they were choked with dust and fibers. Therefore lack of proper ventilation in their working area exposed the weavers and their family members to the contaminated fibers with biological agents (bacteria fungus, etc.) fig 6, 7. It may results in respiratory exposure of these contaminants and skin infections.

Table: 1 Number of Weavers Suffering From Occupational Health Problems Due to Weaving
Operations: N=70

S.No.	Health hazard	Frequency (Percentage)
1	Headache	17(24.29%)
2	Spondylitis	22 (31.42)
3	Shoulder pain	30 (42.86%)
4	Backache	35(50%)
5	Pain in palm + Stiffness of hand joints	32 (45.71%)
6	Obesity	5(7.14%)
7	Knee pain+ Pain in calf muscles	30 (42.86%)
8	Breathing problem and chest pain	25 (35.71%)
9	Any hearing problem	10 (14.29%)

* as respondents were facing more than one problem therefore data may exceed from 70

Data being presented in table 1 clearly indicates that 24.29 percent weavers were suffering from headache, 31.42 percent from spondylitis, 42.86 percent from shoulder pain and 50 percent from backache, 45.71 percent from pain in palm and stiffness of hand joints. All these occupational health hazards were found associated with weaving and related activities, as weaving operation involve continuous repetitive movement of hand, shoulders, legs etc. **Daam (1993)**, in his ergonomic research entitled "static force exertion in postures with different degrees of freedom" concluded that repetitive movements involved micro wear and tear in the soft tissue of the limbs. This minor damage in the tissue is repaired if adequate rest is given (which was absent in weaving sectors). Only 7.14 percent weavers were facing obesity; they told that it was due to some other reason like thyrodism and metabolic disorders etc. So continuous sitting does not cause obesity in the present cases. About 35.71 percent weavers were facing breathing problem and chest pain, which might be due to the inhalation of fiber dust during weaving.

14.29 percent respondents faced hearing problem. This might be due to the continuous sound produced by the shuttle during weaving.

CONCLUSIONS

Indian handlooms speak for themselves and they need no reference. Handloom weaving still forms an important sector of Indian textile industry for its exceptionality and impressive characteristic. Apart from providing employment to a large section of society, Indian handlooms showcase India's matchlessness in the globalised world. Therefore the overlooked problems of weavers need due

contemplation so as to augment their competence and quality output. Present study is thus an attempt to identify such problems and processes that may put a weaver at risk of developing work-related illnesses or injuries which are not identified by the artisans and other related organizations. As a result weavers nowadays refuse to take up this inherited craft and opt for other occupations. The present work will thus not only help to intervene and suggest remedies for such hazards but at the same time may also help to bring back the diminishing glory of handloom products and processes.

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