

# Industrial Health and Safety of the Workers in Textiles

Sheelratan S. Bansode, Rahul B. Hiremath

**Abstract**— *The success of firm depends on the manpower skill, attitude and satisfaction towards the job. As a part of Corporate Social Responsibility, the organizations must look to provide a secured and healthy environment for the workers. This also helps to achieve a sustainable growth of the organization. Now a day's many of the business organization have started focusing on the occupational safety and health issues of the workers. But the picture is somewhat different in the decentralized sector of textiles i.e. powerloom and handloom. The safety parameters are not much concerned in these industries and thus the percentage of the accidents and the health issues is considerable in these units. The current work tries to identify the parameters that are affecting the health and safety of the work force.*

**Keywords**— health, OHS, powerloom, safety, textiles.

## I. INTRODUCTION

As far as Indian economy is concerned textile sector is the oldest one. It contributes to about 13 per cent of total India's exports and contribute to 4 per cent to India's GDP. The textile sector is an labour oriented and is one of the biggest employers involving around 45 million people directly or indirectly. The size of India's textile market as of was US\$ 150 billion in 2017, which is projected to grow upto US\$ 250 billion by 2019 [1]. The Indian textiles industry is diversified, the handloom textile sectors at one end, organised sector consisting of apparel spinning, garments segment with latest technology at the other end. The decentralized power looms sector is the largest part of the textiles sector. The state of Maharashtra in India contributes the largest to India's textiles market [2]. Kolhapur, Solapur, Nashik and Thane are the major textile clusters in Maharashtra. The current study focuses on textile sector of Solapur city. Solapur is well known for textile products like bed linens, terry towels, cotton blankets (Hindi chaddar). Today there are around 25,000 power looms providing employment about 100,000 workers. The Solapur textile products also find a considerable place in the export of textile products.

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The current study tries to focus on the present scenario of the textile units in Solapur under the context of the health and safety of the textiles workers. The textile units in the Solapur are established long back with the minimum traditional equipment setup and have not gone for the improvement since years except for few. These units are far

away from the concepts of ergonomic workplace and the health and safety of the workers working in these units

A visit to the textile units in the Solapur city was carried out and the different steps in the process of textile like raw materials, the environmental effect due to usage of raw materials, health of workers and working conditions were analyzed. The study included small scale as well as medium scale units. The study of the workers working for a period of more than 5 years and between the age group of 21 to 50 was selected.

The results revealed that around 85 to 90 percent of workers are affected by the improper working conditions that results in to respiratory problems, eye problems, muscular and body pain. Further the spinning and weaving operations are the major contributor to the respiratory problems, working environment are responsible for the eye problems and the lifting of heavy loads and lack of proper training resulted in muscular and body pain. Hence, there is need to implement policies and procedures for improving the working environment. Proper system for the practice of the occupational health and safety needs to be developed. Apart from this some of the problems are invited by workers' habits of chewing tobacco, drinking alcohol, smoking, and intake of intoxicating materials.

## II. BIOMIMETICS AS A SOLUTION

Many studies can be found where the excellence of nature and its engineering is mention and the strong desire of the researchers to use these engineered systems into technology. Biomimetics is an important aspect for motivating the advances as long as technical advances are accounted. The problems from the world can easily be taken into account by it. The large potential of it is the main feature for its increasing investigation. The results obtained from biomimetics are sustainable, thus people have an optimistic look towards biomimetics. But the studies carried out till date on application of biomimetics are more concerned to product development. On the contrary there are some common laws in nature that are applicable to living, social and likewise organizational systems which can be explored. To cash the benefits of these laws, the study of nature's principles for their application to organizations is necessary. Phil Richardson in his thesis named this as "Business Biomimetics" [4] and proposed it as the emerging field within biomimetics that demonstrates a strategic use of biomimetics in the business environment. It can be used to develop and optimize processes, for business management,

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scheduling etc. The concepts behind the use of biomimetics for management practices/techniques are the social animals/species like ants, honeybees, bats, birds, fish etc and their behavior in particular situations.

A. *Neural Network as Solution for Occupational Health and Safety*

With the beginning of modern computer technology and information science, decision making and predictions based on the available data can be carried out with the help of information systems. Neural Network is one of the systems derived from the working of the neurons in human brain[5]. In the study carried out by Gouri Beriha [6] NN was used to check the manager’s perception, safety officers and workers about OHS, the similar study can be carried out for the textile units with the help of parameters grouped as Economic, Social, Environmental, Health to understand its levels of implementation and to discover important deficient items.

III. DATA COLLECTION

The questionnaire contained 24 items and the workers have to provide response to all the questions using 1 to 5 Likert-type scales (1-strongly disagree and 5-strongly agree). The responses are collected from workers of different textile industries in Solapur through personal contacts. The awareness on 24 items from workers in concern to health and safety is collected. The probability and also the non probability sampling are used for the selection of industries. Stratified random sampling was used under the probability sampling. Random selection of the units for the study is carried out based on based on resemblance in certain characteristics

IV. DATA ANALYSIS

Factor analysis was carried out where one ninety nine responses were tested and the validity as well as the reliability of the scale was tested. The variable testing was conducted with the help of factor analysis for 199 responses with the help of principal component analysis along with varimax rotation to make sure importance and suitability of the variables to use SPSS model. 65 % is the total variance explained and this value is acceptable. For the internal consistency of the survey data the Cronbach’s Alpha ( $\alpha$ ) was computed the value is 0.80 which is above the satisfactory value of 0.70 highlighting the consistency of the scale recognized as suggested by Nunnally (1998).

V. RESULT AND DISCUSSION

The neural network training results is as shown in the figure 1 below. It can be seen that the training has been done in an efficient manner.

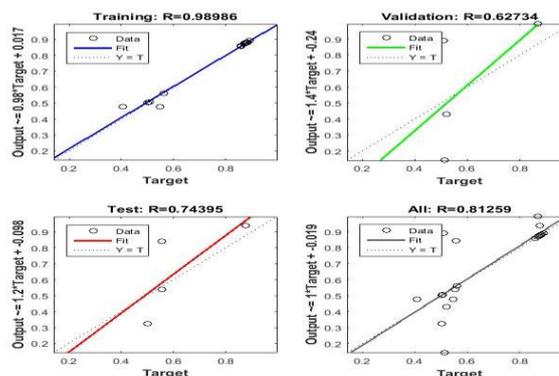


Figure 1: Actual and predicted results

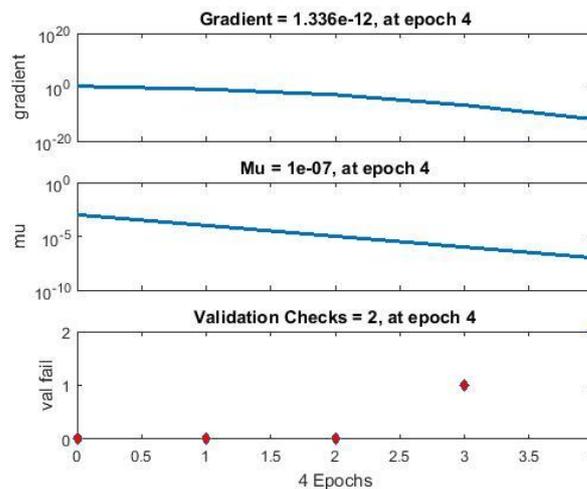


Figure 2: Mean Square error

Further from the sensitivity analysis it can be noted that the most influential parameters out of the total 24 parameters which needs to be solved immediately are as follows

1. Proper training should be provided to the workers
2. Proper medical facilities should be made available
3. Good working environment should be provided to the workers
4. Proper awareness of the occupational health and safety needs to be imparted.
5. Ergonomic design of the working stations needs to be developed.
6. Regular breaks should be provided

VI. CONCLUSION

From the above study it can be concluded that the neural network tool is an effective tool to find out the perceptions of the human relating to a certain phenomena. In this study it was found that the occupational health and safety awareness among the textile workers is very low and there needs to provide proper trainings to the workers. Thus the reduction in absenteeism due to injuries at the work place and other health issues will be minimized and the productivity of the unit will grow to certain extent.



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