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**RNI MAHMUL/2011/38595**

**ISSN No.2231-5063**

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**HEALTH AND SAFETY ASPECTS OF TEXTILE WORKERS FROM  
SOLAPUR (INDIA) TEXTILE INDUSTRIES**



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**Short Profile**

Bhosale S. N. is working as an Assistant Professor at Head, Department of Economics in A.R. Burla Mahila Varishtha Mahavidyalaya, Solapur.



**ABSTRACT:**

Textile sector in India plays an important role in the country's economy, providing employment to a significant population in rural and urban areas. Objectives: This paper focuses on health and safety aspects of textile workers in Solapur City(one of the key textile cluster) in the state of Maharashtra, India. Methodology: A sample of 180 workers from the identified textile industries of Solapur city were assessed for their general physique, muscle tone, lung condition, and eyesight using different techniques.

The study aimed at developing a framework for understanding risks to textile workers resulting from lack of health and safety standards in companies. Results: Findings showed that most of the workers have been affected by respiratory problems, increase in muscle tone, eye problems and musculoskeletal problem. It has been also observed that job security or regular work impacts positively to the worker's long term body health. However, there is an immediate need to adopt and implement measures in accordance with Indian Factories Act (OHSAS 18001/ILO-OSH 2001) which includes directions and procedures in respect of industrial installations, work environment and occupational health and safety guidelines.

**KEYWORDS**

*Textile; health and safety; Policies; Solapur.*

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**INTRODUCTION :**

The textile sector in India plays an important role in the country's economy, providing employment to a significant population in rural and urban areas. It generates about 27% of foreign exchange for the country and is a repository of the cultural heritage of the nation. It is estimated that, this industry will generate more than 12 million new jobs with projected revenue of around US\$ 115 billion by the year 2012. The state of Maharashtra in India with an estimated investment of US\$ 224 million on various textile projects is the biggest contributor to India's textiles market. The prominent textile clusters in Maharashtra are Kolhapur, Nashik, Solapur and Thane. The present study focuses on textile clusters of Solapur city. There is evidence from some studies in India about health risks to industry workers. Suryakar et al [3] carried out a study to assess exposure effects of cotton dust on oxidant and antioxidant status, which may induce, related health hazards. Another article by Agnihotram provided a review of existing evidence from community based epidemiological studies and addressed the growing need for evidence-based occupational health research in India. Knutsson focuses on major disease related to shift work such as sleep disorders and risk of accidents. The effects of shift work on physiological function through disruption of circadian rhythms are well described. Knutsson also provides a model to summarize possible mechanisms of disease in shift workers. Metgud et al conducted an observational cross-sectional study on a sample of 100 women workers with respect to their cardio-respiratory and musculo-skeletal profile before, during and at the end of work, Sant et al have studied the adverse effect of smoke/flue on lung functions of glass factory workers of Firozabad district. Müezzino , Spiro and Stigliani and Hendrickson et al have reported the adverse health impacts of textile effluents. The textiles sector contains many hazards and risks to workers, ranging from exposure to noise and dangerous substances, to manual handling working with dangerous machinery.

**AIMS & OBJECTIVES :**

To develop a framework for understanding the risks textile workers were exposed to due to lack of health and safety standards in the industry.

**MATERIAL AND METHODS :**

During the field survey, semi-structured interviews of unit owners and workers in various textile clusters were conducted with the help of a checklist. The various steps involved in the process of each textile such as raw materials used, the environmental scenario due to usage of raw materials, review of existing CETP units (Centralized Effluent Treatment Plant recently established) and present health status of workers and their working conditions were analyzed. The study covered both small scale and medium scale units. At the first stage out of 29 textile units from the city a total of 6 textile mills were selected by random sampling technique from all six textiles. This is approximately 21% of the entire population. Survey has been done during December 2010 to December 2011. In the second stage, workers were selected from these textile mills. For the selection purpose of respondents a complete list of permanent workers between the age of 20 to 55 which having the minimum 3 years work experience were proportionally selected from all the 6 textile mills. A sample of 180 workers



(consented to be interviewed) from textile industries participated and they were assessed on various measurements. The monitoring equipment's and parameters for measuring occupational health status are detailed below: **Weight and Height:** The body mass index (BMI) is a heuristic proxy for human body fat based on an individual's weight and height. The BMI is dependent on patterns of food consumption, associated living and working conditions, the nature and duration of physical work. **Hand Grip Meter:** The test measures the maximum isometric strength of the hand and forearm muscles. This test is often used as a general test of strength. Strength also depends upon various activities like daily food intake, working hours, and pattern of work. **Peak Flow Meter:** A peak flow meter is a portable, inexpensive, hand-held device used to measure how air flows from the lungs in one "fast blast" [13]. The peak flow measurement of 350 l/min is considered to be normal for adults, while 200 l/min indicates a condition of chronic bronchitis and, therefore, significant lung damage. **Eye testing:** The Snellen chart is used by eye care professionals and others to measure visual acuity. There are several lines of block letters printed on the chart. The first line consists of very large letters or symbols, and subsequent rows have increasing letters or symbols decreasing in size. If the smallest row can be read accurately, it indicates that the person has good eyesight.

## RESULTS :

**Health and Safety Indicators :** In the industries that were surveyed, the team was able to interview and measure the selected health parameters of 180 workers. To aid comparison of the occupational health status, these workers were divided into two categories depending on the number of years of engagement in the current unit: 124 of them had been with the units for up to 5 years, while 56 had worked for more than 5 years. The following [Table 1] shows the no. of workers engaged in various processes in our sample. **Body Mass Index (BMI):** The BMI of the workers [Table 2] indicates that those remaining in the same unit for longer durations had better health. In other words, regular work benefits the workers, while also reflecting the sound health of the industry workers. For the improvement of the body mass index, our findings suggest that regular work with job security over time and incomes that enable the workers to sustain them and their families. **Pulmonary Function Test (PFT) and Pulmonary Health:** The measurement of the PFT gives rise to much concern [Table 3]. In other words, all the workers are being exposed to vapours, gases, fibers, and particles in a work atmosphere that is not conducive for pulmonary health. The precautions to be taken in such situations are to (a) use pigments and cleaning agents that do not emit vapours known to be injurious; (b) install exhaust systems which ensure proper ventilation in the sheds and a regular supply of fresh air; (c) periodic medical check-ups of all workers to identify the early signs of pulmonary distress; and (d) rotation of jobs so that exposed workers are able to reduce the duration and intensity of their exposure. **Hand Grip Meter (HGM) and Muscle Tone:** The result from the Table 4 shows poorer health for the workers in the HGM test. The results of the test indicated that there was a decline in muscle tone. The safety measures comprise (a) regular rest periods to avoid muscle fatigue; (b) better designs of grips for the blocks and screens; (c) design of suitable places and registration guides; and (d) table heights that enable pressure to be applied directly on to the blocks. These measures would also improve productivity. **Eye Strain and Eyesight:** Apart from the effects of work on the body, the lungs, and muscle tone, the repetitive work and the continuous visual attention to detail also seems to have an impact on the eyes of the workers [Table 5]. Normal eyesight, Hypermetropia (long-sightedness), and myopia (short-sightedness) could

be estimated through eye testing using the Snellen chart. In addition, a few of the workers also reported symptoms of watering, cataract, strains and swelling in the eyes in both categories. Our observations at the work place suggest that there is a lack of uniform and adequate lighting in most of the sheds. Proper illumination and regular breaks from work will enable the eye muscles to avoid fatigue and redesign of the working tables to enable work to be done within the normal eye range would offer further relief to the workers as well as improve the quality of the work. Muscular Pains and Body Pains: Additionally, many of the workers also reported muscular pains in the back, at the joints and the lower abdomen [Table 6]. Results revealed that there were some complaints of pain in the chest and the right arm and shoulder. These complaints are clearly related to the nature of work. Regular rest periods are recommended through this report.

## Tables

TABLE 1 PROCESSES AND NUMBER OF WORKERS

Textile Processes	Number of workers				
	Male		Female		Total
	A	B	A	B	
Fiber Formation	4	8	3	5	20
Spinning	5	12	4	7	28
Weaving	5	13	5	7	30
Knitting	6	13	5	8	32
Bleaching	4	10	4	6	24
Dyeing	3	8	3	4	18
Printing	3	6	3	4	16
Finishing	2	5	2	3	12
Total	32	75	29	44	180

TABLE 2 BODY MASS INDEX OF WORKERS

Category of workers	Years worked in present unit	Number of workers	Body Mass Index (BMI)		
			Under Weight	Normal	Over weight
Fiber Formation	0-5	14	6	7	1
	>5	6	1	5	0
Spinning	0-5	18	7	11	0
	>5	10	2	8	0
Weaving	0-5	22	8	14	0
	>5	08	1	7	0
Knitting	0-5	24	5	18	1
	>5	08	00	08	0
Bleaching	0-5	18	01	17	0
	>5	06	00	06	0
Dyeing	0-5	16	02	14	0
	>5	02	00	02	0
Printing	0-5	16	02	14	0
	>5	00	00	00	0
Finishing	0-5	12	03	09	0
	>5	00	00	00	0

TABLE 3 PULMONARY FUNCTION TEST OF WORKERS

Category of workers	Years worked in present unit	Number of workers	Pulmonary Function Test		
			Normal	Asthmatic Tendency	Chronic Bronchitis
Fiber Formation	0-5	14	3	6	5
	>5	6	1	4	1
Spinning	0-5	18	2	12	4
	>5	10	1	5	4
Weaving	0-5	22	4	12	6
	>5	08	1	5	2
Knitting	0-5	24	2	18	4
	>5	08	1	3	5
Bleaching	0-5	18	3	11	4
	>5	06	1	5	00
Dyeing	0-5	16	3	10	3
	>5	02	00	1	1
Printing	0-5	16	2	10	4
	>5	0	0	0	0
Finishing	0-5	12	3	7	2
	>5	0	0	0	0

TABLE 4 HAND GRIP METER TEST OF WORKERS

Category of workers	Years worked in present unit	Number of workers	Hand Grip Meter					
			Above normal		Normal		Below normal	
			Right	Left	Right	Left	Right	Left
Fiber Formation	0-5	14	1	1	0	2	7	3
	>5	6	0	0	0	0	4	2
Spinning	0-5	18	4	3	0	2	11	10
	>5	10	0	2	1	1	4	2
Weaving	0-5	22	0	0	2	1	12	7
	>5	08	1	1	1	1	4	0
Knitting	0-5	24	3	0	2	2	10	7
	>5	08	0	0	2	2	2	2
Bleaching	0-5	18	1	1	2	3	7	4
	>5	06	0	0	0	0	5	1
Dyeing	0-5	16	2	1	3	2	5	3
	>5	02	0	0	1	0	1	0
Printing	0-5	16	2	1	2	1	7	3
	>5	00	0	0	0	0	0	0
Finishing	0-5	12	3	1	1	1	4	2
	>5	0	0	0	0	0	0	0

TABLE 5 EYE PROBLEMS REPORTED BY WORKERS

Category of workers	Years worked in present unit	Number of workers	Eye problems								
			H	M	W	S	C	E	St	N	
Fiber Formation	0-5	14	3	4	1	0	0	0	0	6	
	>5	6	2	3	0	0	0	0	0	1	
Spinning	0-5	18	1	2	0	0	0	2	0	13	
	>5	10	2	2	0	0	3	0	0	3	
Weaving	0-5	22	3	2	1	1	2	0	0	13	
	>5	08	2	2	0	0	3	0	0	1	
Knitting	0-5	24	5	2	2	0	0	0	0	15	
	>5	08	2	2	0	0	3	0	0	1	
Bleaching	0-5	18	1	3	0	0	0	0	0	15	
	>5	06	1	1	0	0	3	0	0	1	
Dyeing	0-5	16	2	2	1	1	1	1	0	8	
	>5	02	1	0	0	0	1	0	0	0	
Printing	0-5	16	2	2	1	1	1	1	0	8	
	>5	00	0	0	0	0	0	0	0	0	
Finishing	0-5	12	1	2	0	0	0	0	0	9	
	>5	00	0	0	0	0	0	0	0	0	



TABLE 6 PAINS REPORTED BY WORKERS

Category of workers	Years worked in present unit	Number of workers	Pains									
			B	J	K	E	LA	C	RS	RA	L	H
Fiber Formation	0-5	14	3	2	0	0	2	1	1	1	0	0
	>5	6	2	0	0	0	0	0	0	2	0	0
Spinning	0-5	18	4	3	1	1	1	1	0	0	0	1
	>5	10	2	2	0	0	0	1	0	1	0	0
Weaving	0-5	22	4	4	3	1	3	1	1	1	1	1
	>5	08	2	0	2	0	0	2	0	0	0	0
Knitting	0-5	24	6	2	1	2	1	2	1	1	1	1
	>5	08	2	2	2	0	0	0	0	0	0	1
Bleaching	0-5	18	3	1	1	1	0	0	0	0	1	1
	>5	06	1	1	1	0	0	0	1	1	0	0
Dyeing	0-5	16	3	1	0	0	0	1	1	1	1	2
	>5	02	1	0	0	0	0	0	0	0	0	1
Printing	0-5	16	3	3	1	1	1	0	2	0	0	2
	>5	0	0	0	0	0	0	0	0	0	0	0
Finishing	0-5	12	3	2	0	1	1	0	1	1	1	1
	>5	0	0	0	0	0	0	0	0	0	0	0

## CONCLUSION :

Muezzino , Spiro and Stigliani and Hendrickson et al have reported the adverse health impacts of textile effluents. The textiles sector contains many hazards and risks to workers, ranging from exposure to noise and dangerous substances, to manual handling working with dangerous machinery. The various steps involved in the process of each textile such as raw materials used, the environmental scenario due to usage of raw materials, review of existing CETP units and present health status of workers and their working conditions were analyzed.

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