

Morbidity Profile of Cotton Weavers in Rural South India



Medical Science

KEYWORDS : Power loom workers, Rural, Morbidity, Byssinosis, Work place environment

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ABSTRACT

Introduction: Cotton mill workers in India constitute a large workforce, and are susceptible to number of diseases due to work-place environment. The present study has been conducted in rural area of South India to study the morbidity profile of cotton weavers using power looms at household levels.

Methodology: Two hundred and ninety five power looms workers were included in a cross sectional study. Socio-demographic, occupational, work-place environmental, behavioral (including use of personal protective equipment) and morbidity data was collected through face to face interview and medical examination. Data were analyzed using SPSS software.

Results: The study revealed that the workers belonged to age groups 15 to more than 65 years, with females outnumbering males. 8.5% of workers smoked, and 45.4% gave history of alcohol consumption. Study of physical environment at workplaces showed that 87.1% workers were employed in overcrowded workplaces, 34.6% were working in suboptimal illumination and 33.2% were exposed to noise pollution. Use of personal protective equipment was extremely low (< 1.5%). The clinical examination revealed that 22.7 had byssinosis, 31.5% other respiratory illnesses, 41.4% eye diseases (including refractive errors), 8.5% were suffering from skin diseases while 19% reported diminished hearing. Low backache and generalized body aches were common symptoms reported by 57.6 and 27.1% of workers, respectively. Anemia (40.3%), hypertension (15.3%), Diabetes (9.5%) and workplace injury (27.8%) were other morbidities.

Conclusion: The study revealed high prevalence of morbidity among the study group. Health education, safe workplace environment, ergonomics and use of PPE can prevent large number of diseases. Supervision of work place environment and behavior change communication for healthy and safe workplace practices e.g. use of PPE are recommended.

INTRODUCTION

The Indian textile industry is the second largest employer after agriculture, providing direct employment to 40 million workers⁽¹⁾. Cotton mill workers constitute a large workforce in textile industry. These workers are susceptible to various morbid conditions due to their work and workplace environment. These conditions range from chronic respiratory diseases (byssinosis, bronchitis and bronchial asthma), arthritis, noise-induced hearing loss, eye strain, varicose veins (due to standing for longer periods), skin problems (due to usage of different chemical dyes) and injuries due to accidents².

Many studies have been conducted in India regarding morbidity profile of cotton weavers. Most of these studies have been carried out in organized sector where the environmental conditions are better, exposure limited to working hours and comprehensive health services are available through various social security schemes. However cotton weaving, both by handlooms and power looms are also a small scale enterprise in India; often managed at family level. These workers, from adolescents to elderly and of both sexes are at higher risk of occupational diseases due to unsafe environment, longer hours of work, non-availability of occupational health services and lack of knowledge regarding health risks due to occupation.

With this background, the present study was undertaken to study the morbidity profile among power loom cotton weavers of Nalgonda district of Telangana.

MATERIAL and METHODS

This cross-sectional study was conducted during June-August 2014 in Cherlapally village of Nalgonda district (Telangana). The village has a population of 7,312 with agriculture as the main source of income. In addition, there are 623 power looms run in 88 houses in the village. A total 320 individuals are working on

these looms. It was planned to include all workers in the study. However, due to non-availability of workers during the period of study or refusal to participate, 25 workers (7.81%) could not be included in the study. The data was collected on a pre-tested structured questionnaire through interview at workplaces. This was followed by clinical examination that included general physical examination, recoding of height and weight, blood pressure and systemic examination. Byssinosis was diagnosed based on WHO classification⁽²⁾. Haemoglobin estimation was done by a laboratory technician using Sahli method. The details regarding environmental conditions in the factories were recorded by inspection of the factory and its surroundings. Use of personal protective equipments was recorded based on replies from the workers. Data was entered in WINDOWS Excel spreadsheet, and analyzed using SPSS version 19. Ethical clearance and informed consent was obtained from Institutional Ethical Committee of the Medical College and each participant, respectively.

RESULTS

A total of 295 cotton mill workers were included in the study. The social, demographic, occupational and life style factors studied are presented in Table 1. As seen the majority of the workers were in age group 36-45, and female (53.6%) outnumbered males.

Table 1: Socio-demographic, occupational and behavioral profile of power loom workers

variable	Class intervals/groups	Number of workers (n=295)	Percentage
Age	15-25	19	6.4
	26-35	71	24.1
	36-45	92	31.2
	46-55	60	20.3

	56-65	33	11.2
	> 65	20	6.8
Sex	Male	137	46.4
	Female	158	53.6
Educational Status	Illiterate	73	24.7
	Literate	12	4.1
	Primary	112	38.0
	Middle	52	17.6
	10+2	32	10.8
	Graduate & above	14	4.7
Social Class*	I	10	3.4
	II	57	19.3
	III	125	42.4
	IV	89	30.2
	V	14	4.7
Type of Family	Nuclear	253	85.8
	Joint	38	12.9
	Three generation	4	1.4
Type of Work	Weaving	235	79.7
	Bleaching	20	6.8
	Weaving + Bleaching	24	8.1
	Others	16	5.4
Duration in occupation	< 5 years	35	2.0
	5-10 years	29	9.8
	more than 10 years	231	78.3
Smokers	Smokers	25	8.5
	Non-smokers	270	91.5
Consumption of alcohol	Consume alcohol	134	45.4
	Do not Consume alcohol	161	54.6

*B G Prasad Classification

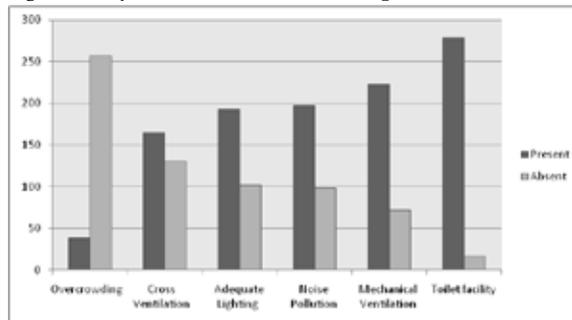
Physical Environment at Workplace (Table 2)

Most of the power looms were located within the houses, and lacked proper infrastructure for safe environment. Thus, large percentage of workers was exposed to unsafe physical environment i.e. Overcrowding (87.1%), lack of cross ventilation (44.1%), sub-standard lighting (34.6%), presence of noise pollution (33.2%) and lack of mechanical ventilation (24.4%). These power looms being located within houses, toilet facilities were available to 94.6% of workers.

Table 2: Occupational Environment at Cotton Mills

Environment at work place	Present	Percentage	Absent	Percentage
Overcrowding	38	12.9	257	87.1
Cross Ventilation	165	55.9	130	44.1
Adequate Lighting	193	65.4	102	34.6
Noise Pollution	197	66.8	98	33.2
Mechanical Ventilation	223	75.6	72	24.4
Toilet facility	279	94.6	16	5.4

Figure 1: Physical Environment at Workplace



Use of Protective Equipment

Large number of occupational hazards of cotton mill workers e.g. respiratory diseases, noise-induced hearing loss and occupational injuries can be prevented by regular use of Personal Protective Equipment (PPE). However, it was seen that the use of PPE was negligible (Table 3). Fire extinguishers were present in only one factory (available to two workers) while First-Aid for injuries was available to 11 workers only.

Table 3: Use of Safety Equipment at Workplace

Protective equipment	Number using	Percentage (%) Using	Not using	Percentage (%) not using
Masks	3	1.0	292	99.0
Gloves	4	1.4	291	98.6
Ear plugs	1	0.3	294	99.7
First Aid Box	11	3.7	284	96.3
Safety equipment(fire extinguisher)	2	0.7	293	99.3

Morbidity Pattern of Cotton Mill Workers. Table 4 depicts the morbidity profile of the cotton mill workers.

Table 4: Morbidity Pattern among Cotton Mill Workers

Disease	Number having symptoms/ signs suggestive of the disease	Percentage (%)
Byssinosis	67	22.7
COPD	23	7.8
Bronchial allergy	19	6.4
Nasal allergy	51	17.3
Eye diseases excluding refractive diseases	59	20.0
Refractory errors	63	21.4
Skin diseases	25	8.5
Hearing loss	56	19.0
Chronic backache	170	57.6
Chronic body aches	80	27.1
Hypertension	45	15.3
Diabetes mellitus	28	9.5
Poor oral hygiene	9	3.1
Workplace injury in past 1 year	82	27.8
Anaemia (Hb < 12 gm%)	119	40.3

Table 4 shows the pattern of various diseases detected among the workers. Byssinosis was present in 67 (22.7%) of the workers. Other respiratory diseases detected were chronic obstructive pulmonary disease (7.8%), bronchial allergy 6.4% and nasal allergy 17.3%. Fifty nine (20%) workers had eye symptoms/signs, while 63 (21.4%) had refractory errors. Dermatitis, mainly due to exposure to concentrated chlorine solution for bleaching of woven cloth was seen in 25 (8.5%) workers. Back ache (57.6%), hearing loss (19.0%) and co-morbid conditions like diabetes (9.5%), hypertension (15.3%) and poor oral hygiene (3.1%) were also observed. Eighty two (27.8%) workers reported workplace injury during the previous one year period.

DISCUSSION

This study that was conducted among 295 power loom workers revealed that workers age extended from 15 years to more than 65 years with 55.3 % of subjects between the ages of 26-45 years. Gender distribution of the study population showed that 53.6% of the study subjects were females while 46.4% were males. Individual disease is discussed below:-

(a) Byssinosis is a disease unique to cotton related occupations, and has been extensively studied. The present study revealed that 67 (22.7%) of the 295 workers had symptoms suggestive of byssinosis. The study findings were in agreement with a study carried out by Wang X-R et al^[3] who detected a prevalence of 24%. Similarly, Merchant JA et al^[4] found that byssinosis was present in 20% of workers employed in preparation rooms. A study conducted by Parikh et al in Ahmadabad^[5] reported slightly higher rates of 29.32% and 37.83% byssinosis in blow and card rooms respectively. On the other hand, a study by Kamat SR et al^[6] reported a lower prevalence of byssinosis varying from 10-14% in various sections of cotton mills. The authors of this study cross-tabulated prevalence of byssinosis against various socio-demographic and other risk factors. However the association between the prevalence of byssinosis and social class, type of work, education and years of exposure were found to be non significant ($p > 0.05$).

(b) Respiratory illnesses (excluding byssinosis) namely chronic obstructive pulmonary disorder, bronchial allergy and nasal allergy were detected among 23 (7.8%), 19 (6.4%) and 51 (17.3%) of 295 workers respectively. The study findings were in agreement with a study carried out by Kamat SR et al^[6] who reported the prevalence of exertional dyspnoea as 56%, chest tightness 54%, wheezing 20%, cough 36% and Monday sickness 22% among 1,241 workers from three textile mills. Another study carried out by Joseph M et al^[7] reported that 54 out of 194 workers had severe respiratory obstruction giving a prevalence of 27.8%.

(c) Eye Diseases and Refractory Errors. Fifty nine (20.0%) workers were detected to have eye diseases and 63 (21.4%) had refractory errors. A study carried out by Yerpude NP and Jogdand KS^[8] revealed that 37 (7.80%) of 474 workers had refractive errors.

(d) Skin Diseases. Bleaching follows the process of weaving and exposes workers to chemical agents. The present study detected that 25 (8.5%) workers out of 295 had skin problems. The most common skin disease was dermatitis due to exposure to concentrated bleaching solutions. The present study was in agreement with a study carried out by Singhi MK et al^[9] that revealed that skin lesions were seen in 7.69% of cotton mill workers.

(e) Musculoskeletal Disorders. Back pain is a common symptom in many occupations including weaving because of lack of ergonomics in developing countries. The present study revealed that out of 295 power loom workers, 170 (57.6%) complained of chronic backache and 80 (27.1%) had chronic body aches. Ko-

skela et al^[10] studied the disability among cotton mill workers in five Finnish cotton mills and reported significantly higher prevalence of musculoskeletal disorders among retired cotton mill workers than rates in the community.

(f) Hearing loss. Textile weavers are at risk to develop Noise Induced Hearing loss (NIHL) due to prolonged exposure to noise above 90 dB. In the present study 56 (19.0%) workers had symptoms suggestive of hearing loss. Audiometric tests could not be done due to lack of facilities in the field.

(g) Oral Hygiene: The present study revealed that 9 (3.1%) workers having poor oral hygiene. This goes in agreement with a cross sectional study conducted during 2009 by Yerpude NP and Jogdand^[8] in Guntur District (AP, now Telangana). The study conducted on 474 male workers revealed that 31 (6.54%) had dental stains and 27 (5.69%) had dental caries due to poor oral hygiene.

(h) Injuries at work place are common among the cotton mill workers due to lack of use of personal protective equipment. The present study revealed that of 82 (27.8%) out of 295 workers had injuries at workplace during previous 1 year. A study conducted by Yerpude NP et al^[6] reported that 2.75% of workers had injuries at the working place.

(i) Anaemia. The present study revealed that 40.3% of workers had hemoglobin levels below 12 gm%. A study conducted by Li R et al in China^[11] among 447 workers also revealed that 34% of workers were anemic. The result of present study findings were also in agreement with a study carried out by Yerpude NP^[6] et al reported prevalence of anaemia among cotton mill workers as 28.90%.

(j) Environment at the work place. Low standards of physical environment at workplace as mentioned in Table 2 of the study may be increasing the frequency and severity of occupational diseases. Thus there is a need for both legislative and educative approaches to improve the work environment for prevention of work-related diseases.

(k) Usage of protective equipment. The study showed that < 2% of workers were using personal protective equipments. A study conducted by Saoji A^[12] et al only 41.3% of workers were using masks, while another study carried out by Paramasivam P^[13] et al reported that 34% of the workers were using personal protective equipment (PPE) during work.^[14] Use of PPE e.g. masks, gloves, eye shields, ear plugs can bring about significant decrease in prevalence of respiratory, skin, eye and ear disorders. Education on these aspects should be stressed during health education activities for the workers.

CONCLUSION

The present study carried out among 295 workers of power looms in Cherlapally showed significant number of morbidities among this group. Many of these diseases are preventable by improving the workplace environment, and regular use of PPE. It is recommended that health education along with supervision of workplace environment should be carried out to improve the health of these workers, so that they can continue to contribute to country's economy.

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