

## Health profile of cotton mill workers

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### Abstract

**Background:** Cotton industry workers are exposed to various hazards in the different departments of textile factories. The major health problems associated with cotton dust are respiratory problems. The aim of the present study is to assess the health profile of the workers in Ginning Factory and to assess the different protective measures used during working day to prevent the different hazards.

**Materials & Methods:** The total number of the studied sample was 100 workers. A questionnaire was constructed include two parts, one to assess the industrial hazards and their preventive measures and the second one included the information regarding demographic and social profile.

**Results:** 37 out of 100 workers reported respiratory morbidities, and we found that statistically significant ( $p < 0.05$ ) results with the male sex, joint type of family, workers from rural place and habit of smoking with chest symptoms.

**Conclusion:** respiratory morbidities were found in the present study and hence pre-employment and periodic health checkups of all the workers should be scheduled in the future at the factory.

### Introduction

Occupational health is essentially preventive medicine. The joint ILO/WHO Committee on Occupational health, in the course of its first session, held in 1950, gave the following definition: "Occupational health should aim at 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 departures from 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 the worker in an occupational environment adapted to his physiological and psychological equipment, and, to summarize, the adaptation of work to man and of each man to his job."<sup>(1)</sup>

Industrial workers constitute only a segment of population, and the factors that influence the health of the population also apply equally to industrial workers.<sup>(1)</sup>

Background cotton and synthetic textile industry in India is the largest industry in the country accounting for 14% of industrial output and providing employment to around 35 million workers. The workers are at risk of suffering from various chronic respiratory illnesses like byssinosis, chronic bronchitis due to exposure to the cotton dust in the workers. Even though quite a few studies have been conducted in textile mills in India, enough emphasis has not been given on the epidemiological aspects of the respiratory morbidities in the workers.<sup>(2)</sup>

Byssinosis, also called "brown lung disease" or "Monday fever", is an occupational lung disease often observed among workers exposed to cotton, flax and hemp dust.

There are at least four major problems related to byssinosis. First, its extent and severity are unknown; Second, the causal agent or agents have not yet been identified; Third, preventive measures, which depend mainly on dust control and medical surveillance, are not universally effective; fourth compensation schemes are inequitable mainly because most physicians have difficulty in disease and in diagnosing the governments have not recognized it as a disabling occupational disease.<sup>(2)</sup>

There is evidence, from several epidemiological studies that the populations of textile workers with the acute symptoms have also had high death rates from respiratory disease and high incidence of severe pulmonary disability.

Byssinosis is diagnosed by questionnaire on a characteristic history of symptoms on the first day of working week of chest tightness or shortness of breath or both; symptoms which in the early stages of the disease improve as the week proceeds.<sup>(2)</sup>

The clinical diagnosis and a grading of byssinosis were based on Schilling's grading:<sup>(3)</sup>

Grade 0: No symptoms of chest tightness or breathlessness on Monday.

Grade½: Occasional chest tightness or breathing difficulty on the first day of the working week.

Grade1: Chest tightness and/or breathlessness on Monday only.

Grade2: Chest tightness and/or breathlessness on Monday and other weekdays.

Grade3: Grade 2 symptoms accompanied by evidence of permanent impairment in capacity from reduced ventilator defect.

## Materials and Methods

A cross-sectional study was undertaken to study the health profile of cotton factory workers of Sri Raghavendra cotton mill and Sri Doddabasaveshwara cotton ginning factory, Ballari.

At the time of the study i.e. April 7, 2015 to May 6, 2015, Workers approached through convenient sampling to participate in this research program. Their work involves two main activities: ginning and pressing. Medical facilities were not available in the premises neither pre-employment nor periodic medical examination was available for worker.<sup>(4)</sup> Data collection procedure was by interviewing workers through predesigned semi structured questionnaire. It was pretested and found to be applicable for the study population. It was administered via a one on one interview. The questions included personal and work characteristics, use of personal protective devices, respiratory health symptoms (such as symptoms of dyspnoea, cough, breathlessness, phlegm, chest tightness and chronic bronchitis), smoking habits and detailed occupation history, previous history of asthma.<sup>(3)</sup>

The mill management was briefed about this research exercise so as to acquire approval and clear any administrative reservations. Consent was taken from all the subjects. All ethical consideration and confidential protection of the individuals was specially observed.

## Results

Table (1) shows that the total number of workers was 100. The majority of workers (68%) were males. Nearly half of the patients (51%) belonged to the age group of 20-40 years. The vast majority of workers (96%) were from Hindu religion. About two third of workers (68%) had education.

**Table 1: Distribution of study subjects according to demographic characteristics**

Variable	Frequency	Percentage (%)
<b>Age in years</b>		
<20	37	37
20-40	51	51
>40	12	12
<b>Sex</b>		
Male	68	68
Female	32	32
<b>Religion</b>		
Hindu	96	96
Muslim	4	4
<b>Education</b>		
Illiterate	32	32
Primary-higher primary	33	33
High school & above	35	35

Table (2) shows that nearly two third (62%) of them were married. 68% were from nuclear family. And 45 had kaccha house followed by 39 pakka house.

**Table 2: Distribution of study subjects according to housing type and marriage**

Marital status		
Married	62	62
Unmarried	37	37
Widow/Widower	1	1
<b>Type of family</b>		
Nuclear	68	68
Joint	29	29
Broken	3	3
<b>Housing Type</b>		
Pakka	39	39
Kaccha	45	45
Semi	16	16

Table (3) nearly half (46%) of workers had normal BMI between 18.5 to 24.99Kg/m<sup>2</sup>, followed by 36 workers had less than 18.5Kg/m<sup>2</sup> and 18% were overweight and only 4workers had BMI more than 30Kg/m<sup>2</sup>.

**Table 3: Distribution of study subjects according to BMI**

BMI(Kg/m <sup>2</sup> )	Frequency	Percentage
<18.5	36	36
18.5-24.99	46	46
25-29.99	14	14
>30	4	4

Table (4) shows that 27% of the participants were current tobacco chewers, 14% smokers and alcohol intake was reported by 17% of workers.

**Table 4: Distribution of study subjects according to personal characteristics**

Characteristics	Frequency	Percentage
<b>Smoking</b>		
Smoker	14	14
Non smoker	86	86
<b>Tobacco Chewing</b>		
Chewer	27	27
Non chewer	73	73
<b>Alcohol</b>		
Alcoholic	17	17
Non alcoholic	83	83

Table (5) shows the occupational characteristics of the workers. Less than one fourth (24%) of workers reported that they work in the area of ginning and pressing where they expose to more of dust compared to 52% of coolies and 24 % workers working in other areas, like administrative or writing work. Nearly two third (62%) of the workers reported work experience between 1 to 5 years, followed by 14% workers told

working since more than 5years. One fourth of the workers told they use safety guards.

**Table 5: Distribution of study subjects according to occupational characteristics**

Type of activity		
Coolie	52	52
Ginning & pressing	24	24
Others	24	24
Exposure		
<1 year	25	25
1-5 years	61	61
>5 years	14	14
Use of safety guards		
Yes	25	25
No	75	75

Graph 1 shows the morbidity profile of workers in the factory. 17%reported that they had cough during the time of examination, followed by 16% complained of body pains. 9 workers reported to have chest tightness on first working day whereas 8 told they experience breathlessness throughout the week. The symptoms are not exactly suggestive of byssinosis.

**Graph 1: Distribution of study participants according to morbidity**

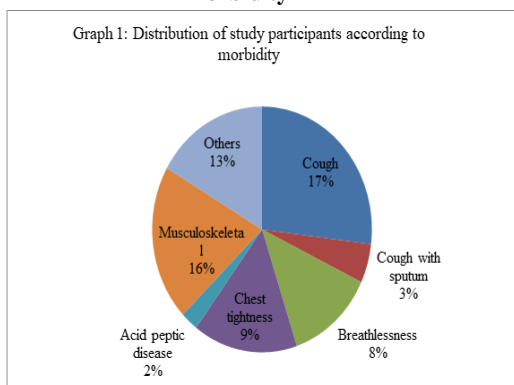


Table 6 depicts some risk factors associated with occurrence of chest symptoms. We found that statistically significant ( $p < 0.05$ ) results with the male sex, joint type of family, workers from rural place and habit of smoking with chest symptoms.

**Table 6: Risk factors associated with occurrence of chest symptoms**

Variables	Chest Symptoms		
	Yes	No	Total
Type of activity			
Coolie	22	30	52
Ginning & pressing	9	15	24
Others	6	18	24
Total	37	63	100
	$p = 0.3475$		
Duration of Exposure			
<1 year	12	13	25

1-5 years	20	41	61
>5 years	5	9	14
Total	37	63	100
	$p = 0.15204$		
Use of Safety guards			
Yes	7	18	25
No	30	45	75
Total	37	63	100
	$p = 0.2818$		
Sex			
Male	30	38	68
Female	7	25	32
Total	37	63	100
	$p = 0.032$		
Place of residence			
Urban	1	10	11
Rural	36	53	89
Total	37	63	100
	$p = 0.042$		
Type of Family			
Nuclear	20	48	68
Joint	16	13	29
Broken	1	2	3
Total	37	63	100
	$p = 0.0548$		
Smoking			
Yes	10	4	14
No	27	59	86
Total	37	63	100
	$p = 0.00401$		

### Discussion

The relationships between type of occupation and pulmonary contaminants and respiratory symptoms have been studied since long time.

Present study revealed that among 100 workers 37 workers had respiratory morbidities, cough (17%), and cough with sputum (4%), breathlessness (8%), and chest tightness (9%).

Though cotton dust has been established as a causative agent for respiratory morbidities, it is important to determine the other risk factors associated with the occurrence of diseases so as to implement comprehensive preventive measures. So we tried to determine the associations of various factors such as age, sex, religion, type of family, lower socioeconomic status, obesity, duration of exposure, non-usage of protective devices and smoking. Our finding regarding influence of smoking was very much similar to those reported by other studies.<sup>(2,5,6)</sup>

In general the higher age has been established as a risk factor for respiratory morbidities in a cotton mill various sections are contaminated with different levels of cotton dust. The section of a mill in which a person works can have a definite association with a prevalence of disease. But the factories where we studied were having only two sections i.e. blowing and carding sections, other workers we enrolled were coolies and administrative works. We could not find any association between the sections, duration of exposure and developing chest symptoms probably because of small number we assessed and most of them

were in the department of administration work. Most of the studies showed significant association between the working sections and developing the disease.<sup>(7,8)</sup>

### Conclusion

Objective of our study was to find out respiratory morbidities among workers. Thirty seven workers had symptoms suggestive of respiratory disease. It is concluded that male sex, place of residence, joint type of family and smoking were seen to be associated with the occurrence of respiratory morbidities in cotton mill workers. Tobacco smoking and chewing should be dissuaded and efforts should be made to improve the overall health status of spinning mill workers. Need of health education regarding use of personal protective devices such as masks and other respiratory devices. Workers having respiratory morbidities must be removed from the section of the work with high dust concentration to better assign work in other dust free sections. Pre-employment and periodic examination of workers should be carried out.<sup>(1)</sup>

### Limitation

- As the cotton factory where we conducted study included only two section i.e. ginning and pressing, could not find any association between dust exposure and occurrence of respiratory disease.
- Study sample size was very less.

### Acknowledgement

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