

# Prevalence and pattern of Respiratory Health Problems among Power Loom Workers in Mohallah Hajiabad, Faisalabad

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## ABSTRACT

**Introduction:** Power loom workers are at constant exposure of different pollutants e.g. cotton dust and Particulate Matter emitted from textile industry. These substances have become main causes of respiratory problems among humans throughout the world including Pakistan. A survey-based research was conducted to study the prevalence and pattern of health problems among power loom workers in Mohallah Hajiabad, Faisalabad.

**Objectives:** The objectives of the study are to figure out prevalence and pattern of respiratory Health problems among power loom workers. And also observe current safety measures used by Power Loom workers and to make recommendations on the basis of study results.

**Methodology:** Data was collected from a sample of 150 power loom workers in Mohallah Hajiabad, Faisalabad. A self-structured questionnaire was used to gather information about factors affecting respiratory health of power loom workers. Data was analyzed with the help of statistical software GNU PSPP (Version 0.7). Frequencies were calculated in descriptive analysis and associations were calculated by applying chi-squared test of significance.

**Results:** Out of the 150, 105 power loom workers (70%) were smokers and the rest were non-smokers. Among 150 workers 119 (79.33%) were suffering with respiratory problems and 31(20.67%) had no respiratory issues. There was a significant positive relation between working hours and respiratory problems among workers. The results also show a positive significant association between occurrence of respiratory problems and time span of job.

**Conclusion:** Time span of job and working hours increase the span of exposure to Particulate Matter and significantly increase the risk of respiratory illness. Smoking also proved out to be one of the major causes of respiratory illness among power loom workers. Cleanliness and proper ventilation can decrease the risk of exposure to Particulate Matter, thus decreasing the chance of respiratory health problems.

**Keywords:** Prevalence, pattern, respiratory health problems, power loom workers.

## INTRODUCTION

Textile industry is one of the important sectors that have major contribution in economy of Pakistan. It contributes 65% in national export and 46% in Industrial production. It consists of 38% of employed Industrial workforce and contributes 9% in Gross National Product (GNP)<sup>1</sup>. Weaving is ranked as one of major industries in many countries. It is completed with the help of high speed looms. There are two sub-sectors in weaving sector; power looms and Independent weaving units. Five categories of woven clothes are produced in Pakistan; Bleached, Dyed, Printed, Greigh, Blended. These clothes are exported to USA, Hong Kong, Dubai, EU, China and Turkey<sup>2</sup>. Around 91% of grey cloth which is produced in Pakistan and majority of exported cloth comes from power loom sector<sup>3</sup>. It is important to note that this sector of textile industry is running without much research or innovation. Various epidemiological studies indicate decreased respiratory function as well as other problems due to long term exposure with air pollution<sup>4</sup>.

Industrial air pollutants can damage membrane structure as well as mechanical efficiency of lungs leading to altered functional properties, thus causing respiratory problems<sup>5</sup>. Power loom workers are at constant exposure of different pollutants e.g. cotton dust and Particulate Matter (PM) emitted from textile industry<sup>6</sup>. PM has become a major cause of health issues even in developing countries including Pakistan<sup>7</sup>. PM includes liquid/solid particles dispersed in ambient air. The smaller the diameter of PM, the more dangerous they are. They can penetrate in deepest part of lungs causing bronchitis, heart diseases and emphysema. The level of effect of PM depends upon age, gender, smoking habit, level of exposure, health problems and age group<sup>8</sup>.

Various pulmonary and systemic health issues are associated with cotton dust such as generalized malaise, rise in body temp cough, chronic bronchitis, phlegm, asthma, emphysema and byssiosis<sup>9,10,11</sup>. Decreased lung function has also been reported by recent studies, through spirometry<sup>12,13</sup>. Power loom

workers often lack proper housing, sanitation, ventilation, proper electricity, water supply, natural and artificial lighting in working area. Power loom workers often suffer serious illnesses; respiratory problems, mental disorders, musculoskeletal problems, stress, skin problems, eye diseases, gastritis and injuries. Health problems are often accompanied by poverty, poor diet, lack of education, excess working hours and working conditions<sup>10</sup>.

Power loom sector is one of the important but unrecognized parts of textile industry that is engaged in production of natural fiber fabrics like cotton, silk and woollen, as well as man-made and mixed fiber fabrics and mainly run by private establishments<sup>14</sup>. It is the sector of textile industry that is running without much research among health of the workers. Power loom workers are hardly benefited from occupational health and safety provisions in the developing countries. As a result power loom workers suffer from many serious medical conditions<sup>15</sup>. This present study was planned to identify prevalence and pattern of respiratory health problems among power loom workers and to observe current safety measures used by Power Loom workers to prevent health problems.

## MATERIALS AND METHODS

A Descriptive cross sectional survey was conducted among power loom workers in Mohallah Hajiabad, Faisalabad, over duration of 03 months from January 2017 to March 2017. Primary data was collected from a sample of 150 power loom workers during their working hours using a self-structured questionnaire. It was designed to include all necessary parameters which are thought responsible for causing or effecting health problems in workers.

The questionnaire investigated demographic data; name, gender, working area and social status. It also inquired working hours, time span of job, respiratory problems and symptoms of respiratory problems (further categorized as asthma attacks, nose/throat irritation, chest pain and shortness of breath), use of air mask or filter (along with who provided mask), if the problem

become worse during working hours, smoking habit (If yes, which category; regular, irregular or chain smoker), hygienic conditions in working place (cleaned daily or not), number of power looms and workers in study area, number of family members and number of rooms in the house. Approval from owners of Power looms were sought prior to study and an informed consent was obtained from the workers.

Data was analyzed with the help of statistical software GNU SPSS (Version 0.7). Frequencies were calculated in descriptive analysis and associations were calculated by applying chi-squared test of significance. Significance value was set greater than alpha 0.05.

## RESULTS

Working experience of power loom workers was divided in three categories. The results show that 25 workers had experience of less than 5 years (16.67%), 70 people were working from more than five years (46.67%) and experience of 55 workers (36.67%) was more than 10 years.

Out of 150 total surveyed workers, 54.67% (82) were working in ventilated area and the rest of 45.33% were working in congested area. 105 workers reported that their working area was near main road whereas the other 45 reported their working area as far from main road.

Working hours of power loom workers were categorized under four groups i.e. less than 5 hours, more than 5 hours, more than 10 hours and more than 15 hours. Only 8 people worked less than five hours which accounts for 5.33%, 42 workers (28%) fall in category of more than 5 hours, 96 of surveyed workers were working more than 10 hours per day and the rest of them (4) worked more than 15 hours.

Regarding respiratory problems, results showed that among 150 workers 119 (79.33%) were suffering with respiratory problems and 31(20.67%) had no respiratory issues. Respiratory problems in power loom workers were associated with different symptoms, 35 workers had nose/throat irritation, the same number of workers (35) experienced Asthma attacks, 33 workers suffered from shortness of breath and only 16 had chest pain as a symptom of their respiratory problems (Table.1).

Power loom workers were inquired about wearing mask during working hours, results demonstrate that out of 150 workers only 68 (45.33%) wear mask during job and 82 (54.67%) don't use mask.

Results in Table 1 show that 92 out of 119 workers (who have respiratory problems) claimed that their respiratory problems become worse during working hours whereas 27 workers didn't mention any difference in symptoms during working hours.

Results show that, among 119 workers who suffered from respiratory problems, 6 (5.04%) were experiencing symptoms from hours, 23 (19.32%) from days, 28 from weeks and 62 workers had respiratory problems from years.

Among the sample, only 54 workers (36%) were undergoing treatment for their respective respiratory diseases and majority of workers i.e. 96 workers (64%) were not undergoing any treatment.

The results narrate that 105 power loom workers (70%) were smokers and the rest were non-smokers. Further elaborating, smokers were categorized under three types, regular smokers were 73 (48.67%), irregular smokers were 29 (19.33%) and only 3 workers (2%) were chain smokers (Table 1).

**Association Results:** There is no significant relationship between wearing an air mask and respiratory disease. 63% of power loom workers working in congested area are suffering from respiratory disorders. 76% of workers with job experience of less than 5 years have respiratory problems. The same is true for 70% workers with more than 10 years job experience and 92% workers with working experience more than ten years. The results show a positive significant association between occurrence of respiratory problems and time span of job. Working hours also have significant association with respiratory problems (Table.2).

Table. 1: Frequency and Percent of symptoms of respiratory problems, smoking Habits amongst power loom workers

	Frequency	Percent
With Respiratory problems	119	79.33
Without Respiratory problems	31	20.67
No Symptoms of respiratory problems	31	20.67
Nose throat irritation	35	23.33
Asthma attack	35	23.33
Shortness of breath	33	22
Chest pain	16	10.67
Respiratory problems Worse during working hour	92	77.31
Respiratory problems not Worse during working hour	27	22.68
With Treatment	54	36
Without Treatment	96	64
With Smoking habit	105	70
Without Smoking habit	45	30
Regular smoker	73	48.67
Irregular smoker	29	19.33
Chain smoker	3	2

Table. 2: Association of working hours, working area, use of the mask and duration of job with respiratory problems

	Respiratory problem		
	Yes	No	Total
Working hours Less than 5 hours	6.0	2.0	8.0
Working hours More than 5 hours	27.0	15.0	42.0
Working hours More than 10 hours	84.0	12.0	96.0
Working hours	2.0	2.0	4.0
Mask use	48.0	20.0	68.0
No Mask use	71.0	11.0	82.0
Congested Working area	43.0	25.0	68.0
Job duration Less than 5 hours	19.0	6.0	25.0
Job duration More than 5 hours	49.0	21.0	70.0
Job duration More than 10 hours	51.0	4.0	55.0

## DISCUSSION

In present day study, 150 power loom workers surveyed via questionnaire. Out of 150 power loom workers, 79.33% had respiratory problems. According to findings of this study, smoking, time span of job, congestion and cleaning are main factors other than PM that are associated with respiratory problems. Although cigarette smoking is major factor in causing respiratory problems but occupational environment also has significant effect on lungs [16]. Although, in many countries, community smoking rates are declining but the fact that smoking rates are not evenly distributed among different occupational categories still remains<sup>17</sup>. Out of 150 power loom workers, 70% (105 workers) were smokers. Among them 48.67% were regular, 19.33% irregular and 2% were chain smokers. Smoking is one of most important risk factor for noncontagious diseases<sup>18</sup>. Smoking habit is significantly associated with respiratory illness, 95% of smokers have respiratory problems.

This study was in line with Babu et al. [17] and Mangesh et al. [19], who observed similar relation between smoking and health problems. Results show that all (100%) the chain smokers, 95% of regular smokers and 93% of irregular smokers are suffering from respiratory problems. It is generally considered that light and irregular smokers are at lower risk of health problems in comparison with heavy, regular and chain smokers [20]. But even light smoking has chronic respiratory problems and can't be presented as "health long term choice"<sup>21</sup>. According to survey, 42.2% of non-smokers also had respiratory problems which reveal that smoking is not the sole factor responsible for health problems. But smokers have greater rate of respiratory problems. Thus, it can be said that among smokers, smoking increases the risk factor of respiratory problems but among nonsmokers exposure to particulate matter is major cause of health problems. Just like smoking effects other body organs along with lungs, particulate matter also causes several distinct disorders. In same way a single respiratory problem can have several underlying causes<sup>22</sup>.

According to results, congestion and cleanliness have significant relation with respiratory problems of power loom workers. Congested areas have higher risk of damaging respiratory health of workers. Cleanliness and ventilation decreases the risk factor because the extent of exposure with particulate matter can be lowered by proper ventilation and regular cleaning of working environment<sup>23</sup>. Although ventilation doesn't directly relate to health of workers but it controls the indoor environment and concentration of air pollutants thus indirectly controlling occupant's health<sup>24</sup>. In results, working hours had positive relationship with respiratory problems.

With increase in working hours, there was a significant increase in risk of respiratory problems. More working hours assure longer exposure to particulate matter, thus the risk factor of pulmonary problems increase. Work duration, work intensity and condition of working place are major risk factors for occupational asthma or respiratory problems. Among workers with respiratory problems, 77.3% claimed that their illness becomes worse during work hours. Dockery et al.<sup>15</sup> reported that workers complain symptoms of disease worsen during 4-8 hours after start of their work shift.

**Recommendations:** This research is a baseline study and provides base for further researches. Textile industry is very important for the economy of Pakistan but air pollution and smoking has put the health of power loom workers in danger. Further studies should be planned to ensure the health of power loom workers. This study is based on information provided by power loom workers, different methods can be used in future to examine health status of power loom workers and get a true picture of how different parameters relate to respiratory health of workers. Smokers should be educated about health hazards of smoking and guided for complete cessation of smoking habit. Working area should be properly cleaned and ventilated for decreasing exposure to particulate matter.

## CONCLUSION

It is concluded that PM causes pulmonary infections and airway problems in power loom workers. Nose/throat irritation, Asthma and shortness of breath are most reported symptoms whereas chest pain is less common among respiratory diseases. Smoking is one of the major risk factors that increase the chances of respiratory problems. Cleanliness and proper ventilation can decrease the risk of exposure to PM, thus decreasing the chance of health problems. Time span of job and working hours increase the span of exposure to PM and significantly increase the risk of respiratory illness.

## REFERENCES

- Liaquat F, Hassan M, Biological Treatment of Textile mill waste water in presence of activated carbon, Environmentally Sustainable Development, Department of Environmental Sciences, Comsats, Institute of Information Technology, 2005.
- Shah, AS, Ali, A, Impact of Textile Industry on Pakistan Economy, Revista Română de Statistică, 2012.
- Sheikh H, Pakistan bed linen exports: Problems & Prospects, Pakistan Textile Journal, 2005.
- Meena, ML, Occupational risk factors of workers in the Handicraft industry, Ashort review, International Journal of research in engineering and technology, 2012, 1(3): 20-24
- Nitin N, Peak expiratory flow rate (PEFR) in hairdressers, Indian J. physiol. Pharmacol., 1999, 43(3): 393-397
- Murlidhar V, Murlidhar VJ, Kanhere V, Byssinosis in a Bombay textile mill, Natl. Med. J. India, 1995, 8(5): 204-207
- Khan, J, Yardley, J, As China roars, pollution reaches deadly extremes. The New York Times, 2007. Kilburn K, Byssinosis and other diseases of textile workers, In: Rom WN, Environmental and occupational medicine, 3rd edn. Philadelphia: Lippincott-Raven Publishers, 1998:449-55.
- Pope, CA, Burnett, RT, Thun, MJ, Calle, EE, Krewski, D, Ito, K, Thurston, GD, Lung cancer, cardiopulmonary mortality and long term exposure to fine particulate air pollution, J. Am. Med. Assoc., 2002, 287(9), 1132-1141
- Korn, RJ, Dockery, DW, Speizer, FE, Ware, JH, Ferris, BG, Occupational exposure and chronic respiratory symptoms; A population based study, Am. Rev. Respir. Dis., 1987, 136: 298-304.
- Woldeyohannes M, Bergevin Y, Mgeni AY, National Institute of Occupational Health, Respiratory problems among cotton textile mill workers in Ahmedabad, Ethiopia. Br. J. Ind. Med., 1991, 48:110-15.
- Niven RM, Fletcher AM, Pickering CA, Chronic bronchitis in textile workers, Thorax, 1997, 52:22-27.
- Christiani DC, Wegman DH, Eisen EA, Pulmonary function among cotton textile workers: A study of variability in symptom reporting, across-shift drops in FEV1, and longitudinal change. 1994, 105:1713-21.
- Wong, WT, Lau, TS, Neller A, Wong, SL, Tam, W, and Pang, SW., Air pollution and hospital admission for respiratory and cardiovascular diseases in Hong Kong, Occup. Environ. Med., 1999, 56: 679-683 .
- Viegi, G, Prediletto, R, Paoletti, P, Respiratory effects of occupational exposure in a general population sample in North Italy, Am. Rev. Resp. Dis., 1991, 143: 510-515.
- Dockery, DW, Speizer, FE, Starm, DO, Ware, JH, Spengler, JD, Ferris, BG, Effects of inhalable particles on respiratory health, Am. Rev. Respir. Dis., 1989, 135: 578-594
- Anthonisen NR, Connett JE, Murray RP. Smoking and lung function of Lung Health Study participants after 11 years. Am J Respir Crit Care Med, 2002, 166 (5):675-679.
- Babu AS, Madan K, Veluswamy SK, Mehra R, Maiya AG, Worksite health and wellness programs in India. Prog. Cardiovasc. Dis., 2014 56: 501-507.
- Lopez AD, Murray CC, The global burden of disease, 1990-2020. Nat. Med., 1998, 4:1241-1243.
- Mangesh PS, Eve NM, Pratibha P, Glorian S, Sameer N, Anne SM, Gupta PC, The Prevalence of Tobacco Use among Manufacturing Workers: Findings from the Baseline Survey of the Mumbai Worksite Tobacco Control Study, Preventive Medicine, 2016, 1(3): 1-10
- Mckusick, VA, Disease of the genome: An interview with Victor A, Mckusick, J. Am. Med. Assoc., 1984, 252:1041-1048.
- Ling PM, Glantz SA, Tobacco industry consumer research on socially acceptable cigarettes, Tob Control 2005, 14(5).
- Glantz SA, Ling PM, Social Smoking: Implications for Public Health, Clinical Practice, and Intervention Research. American Journal of Preventative Medicine, 2009, 9(8):801-801.
- Harber, P, Barnhart, S, Boehlecke, B, Respiratory protection guidelines, Am. J. Respir. Crit. Care Med., 1996, 154: 1153-1165
- Ostro, B, Outdoor air pollution: assessing environmental burden of disease at national and local levels, Geneva, 2004