



## Occupational Health of the Garment Workers in Bangladesh

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### Abstract

**Background:** In Bangladesh, garment workers comprise of both men and women of young age of which women are the majority. Occupational exposure to cotton dust, fibers, metal fumes and different chemicals used in the apparel manufacturing industries cause a wide range of physical and psychological health problems in the garment workers that have not been investigated.

**Objective:** Considering the working environment as the source of individual exposure, we sought direct evidence for physical and psychological health problems of the men and women garment workers in Dhaka, Bangladesh.

**Methods:** A total of 60 workers of two garment factories, and 50 control subjects, not exposed to the garment working environment, were enrolled in this study. Their self-reported occupational health problem(s) was recorded on preformed questionnaires that were analyzed to investigate occupation-related health problems.

**Results:** About 73% of the garment workers suffered from skin rash and contact dermatitis, 52% had breathing complications and coughing while 33% had recurrent fever, all of which were significantly higher ( $p < 0.001$ ) than the control subjects who were in other occupations. Body pain, fatigue, headache, jaundice, anorexia and weakness were more prevalent in the garment workers than in the control subjects.

**Conclusion:** This study, conducted on a small sample size, provides the first evidence of the occupational health problems in the garment workers in Bangladesh.

**Keywords:** Bangladesh, Cotton dust, Garment workers, Occupational health problems.



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### 1. Introduction

The garment industry in Bangladesh began its journey in 1978, now exporting ready-made apparels including woven, knitted, and sweater garments which grew spectacularly to become a multi-billion USD export sector and a major source of foreign exchange. The sector currently accounts for 76% of the country's export earnings and 10% of its GDP. The garment industry employs about 4.5 million workers, of whom about 80% are women [1]. It has been a major source of employment for the rural migrant women who have been largely excluded from formal work in the cities due to their relatively low level of education and training. Many women of the garment factories are working in hazardous social conditions and suffer from various work-related stress and depression.

In a study conducted in Fiji, it was found that the garment workers suffer from physical and psychological health problems including 'occupational fatigue syndrome', body pains, obesity, and bladder and kidney problems, among others [2]. Although there is no global database on dust exposure, there is hundreds of millions of people worldwide exposed to hazardous dusts in the course of their work. Such exposure have been documented in mining or quarrying in the United States, [3] India, [4] and China; [5] timber milling in Canada; [6] in lead battery manufacture in India; [4] and in wool textile manufacture in Britain. [7] Chemicals such as turpentine, benzene, dye, bleaching agents etc. used in garment industries are responsible for many types of dermatitis among the workers. It has been found that more than 95% of all occupationally-related skin diseases in the working populations of industrialized countries are due to contact dermatitis [8].

There are reports of increased risks for several malignancies in textile workers, including nasal cancer, sinonasal cancer [9] and oral and pharyngeal cancer [10], [11]. A case-cohort study nested in a cohort of female textile workers

in Shanghai, China, showed occupational exposure to cotton dust, acids, and caustics, and working in dyeing and printing in the textile industry may increase the risk for esophageal and stomach cancers. [12] There is a possible association between occupational exposure to dust and ischemic heart disease [13]. No study has been conducted on the occupational exposure to cotton dust as dusts and dyes may also contribute to heart diseases of the garment workers. These workers may also experience allergic response and occupational asthma due to inadequate ventilation and inhalation of cotton dust, metal fumes and several other chemicals. In view of scarcity of data on such a large workforce, this study was undertaken to evaluate the occupational health of the garment workers in Bangladesh.

## 2. Materials and Methods

### 2.1. Study Subjects

The garment workers who lead their lives through tremendous work pressure for 10-14 hours per day at the factory were randomly selected for this study. A total of 60 workers of two garment factories at Mirpur, located at the northern part of Dhaka city, were enrolled in this study. There were 15 men and 45 women among the garment workers. Another group of 50 healthy subjects, 21 men and 29 women, not exposed to the garment working environment, were enrolled as the controls. They were hospital staffs, gardeners, men and women cleaners of female student's dormitory and hose maids.

### 2.2. Data Collection on Questionnaire

After informed consent, the researchers with the help of a public health nurse interviewed all the participants (garment workers and control subjects) of the study personally. The information on work-related health problems (if any), education, monthly wages, working hours, and service duration, anthropometric parameters including age, height, and body weight of the subjects were recorded on preformed questionnaires. Each participant was interviewed once; physical and psychological health problem(s) noted was on the basis of self-reporting.

### 2.3. Statistical Analysis

Data analyses were carried out using the Statistical Package for Social Sciences (SPSS). The methods used were independent sample *t*-test for comparison of two groups (garment workers, and control subjects); significance of differences in categorical variables was assessed by Chi-square ( $\chi^2$ ) test with Yates' correction; and simple statistics. The results were considered significant when *p* was  $\leq 0.05$ .

## 3. Results

### 3.1. Demographic Characteristics of the Study Subjects

In this study, 75% of the garment workers were women. The baseline characteristics showed the age of the garment workers varied from 12–28 yrs (men: 14-28 yrs; women: 12-25 yrs), and the mean $\pm$ SD body mass index (BMI) was 19.2 $\pm$ 2.3 kg/m<sup>2</sup>. The mean $\pm$ SD age of the control group was 24.8 $\pm$ 8.0 yrs that ranged from 17–35 yrs; and they had a mean $\pm$ SD BMI of 21.3 $\pm$ 1.6 kg/m<sup>2</sup>. Among the garment workers, about 10% had no formal education, 15% could only write their names, 40% studied up to grade 3, and the remaining had higher education (either primary school or higher classes). The monthly wage of the garment workers varied from Taka 3,300-10,500 with a mean value of Taka 3,818 (about US\$ 55). Their mean service duration at the garment factory was 2.0 yrs (range: 3 m-10 yrs). The monthly wage of the control group varied from Taka 3,500-12,000 with a mean value of Taka 4,241 (about US\$ 60). It was found that the garment workers had significantly longer working hours than the control subjects. The demographic characteristics of the study populations, and men and women garment workers are shown in Table 1.

### 3.2. Physical Health Problems of Garment Workers

The common physical health problems of the garment workers were skin rash, irritation and contact dermatitis (about 73% of the garment workers suffered from these), breathing complications and coughing (about 52% complained). The workers also suffered from recurrent fever (about 33%), asthma, headache, jaundice, fatigue, weakness and anorexia (Table 2). Many had lower back pain, shoulder pain, leg pain and abdominal pain. Most of the garment workers had more than one physical health problem irrespective of their age and gender. Some of the above physical health problems were also encountered by the control subjects who were in other occupation. Table 3 shows a comparison of physical health problems in the garment workers and control subjects.

**Table-1.** Demographic characteristics of the garment workers and control subjects, and men and women garment workers

Study population	Age (Yrs) Mean $\pm$ SD	BMI (kg/m <sup>2</sup> ) Mean $\pm$ SD	Working hrs Mean $\pm$ SD	Service duration Mean $\pm$ SD (Yrs)	Monthly wage (Taka)
GW, N=60	18.7 $\pm$ 4.2	19.2 $\pm$ 2.3	11.0 $\pm$ 1.11	2.0 $\pm$ 2.3	3818 $\pm$ 1739
CS, N=50	24.8 $\pm$ 8.0	21.3 $\pm$ 1.6	8.0 $\pm$ 0.87	3.5 $\pm$ 2.1	4241 $\pm$ 1445
<i>statistics (p-value)</i>	NS	NS	p<0.001	NS	NS
MGW, N=15	20.1 $\pm$ 4.8	18.9 $\pm$ 1.9	11.1 $\pm$ 1.7	2.1 $\pm$ 2.6	4167 $\pm$ 1910
WGW, N=45	17.8 $\pm$ 3.6	19.1 $\pm$ 2.7	10.9 $\pm$ 1.8	1.9 $\pm$ 2.2	3435 $\pm$ 867
<i>statistics (p-value)</i>	NS	NS	NS	NS	NS

CS: control subjects; GW: garment workers; MGW: men garment workers; NS: not significant; WGW: women garment workers; Working hrs: hours per day.

### 3.3. Psychological Health Problems of Garment Workers

The major psychological health problems of the garment workers (both men and women) were caused by tremendous work pressure to meet the hourly and daily targets, constant fear of losing the job, overcrowded working conditions, verbal and physical abuse, insecure feeling during work at night or forced overtime (women workers). Exposure to excessive light, noise and electromagnetic fields generated from machineries, inhalation of metallic dust and fibers from different fabrics also made them feel sick. Frequent tragic accidents in the garment factories were also the constant source of anxiety both for the men and women workers. In this study, men represented 25% of the workforce but they performed the better paid jobs such as technicians, line managers and supervisors while the women were employed mostly for the lower paid jobs such as sewing machine operators, and ‘helpers’. The mean monthly wage of the women garment workers was lower than that of the men workers (Table 1).

**Table-2.** Assessment of physical health problems of the garment workers

Garment workers N=60	No. of subjects (%) with physical health complain						
	Skin rash (itch, irritation)	Breathing problem, cough	Asthma	Frequent fever	Abdominal pain	Body Weakness, pain	Anorexia headache
	44 (73)	31 (52)	9 (15)	20 (33)	4 (7)	4 (7)	6 (10) 7 (12)

About 78% of the women workers were found below 20 years of age; these young women provided the hard labor needed to meet the production targets set by the garment factory owners. Thus the women were employed in a highly exploitative context, working long hours for poverty wages and denied basic rights like off time/break and holidays. Since the garment workers were mostly rural women who did not have much education and skills they had no other option but to work for the garment industry. Further, living in extreme poverty with poor prospects for promotion to better jobs and wages were reasons for depression and psychological health problems.

### 4. Discussion

In this study, the physical and psychological health problems were studied in the garment workers and the findings were compared to those in the control subjects who were in other professions. The garment workers, mostly women, were found to suffer from different types of psychosocial problems including insecurity. The mental workload of the garment works is mainly due to the complexity of their task and its speed in which high level of mental activity, visual attention and precision movement is required where eyes, hands and feet must be constantly coordinated. These workers continuously experienced tremendous workload to meet the production target. An increased mental workload may represent a source of psychological stress. [1],[14].

In this study, about 69% of the garment workers were below 20 years of age of which women represented 78%. The employers claimed that older workers performed more poorly and made more mistakes, and that was the reason they favored younger women workers who were seen as more docile and less ready to protest their paltry wages. However, the demographic characteristics showed no significant difference between the men and women workers (Table 1). The garment workers encountered a wide range of physical health problems including skin irritation, breathing complications, fever, body pain, headache and anorexia, among others (Table 2). Some of the workers with service duration as short as 3-4 months at the garment factory also had the above complain.

**Table-3.** Comparison of physical health problems of the garment workers and control subjects

Physical health problem	Number of subjects (%)		Statistics	
	GW, N=60	CS, N=50	$\chi^2$	p-value
Skin rash (itch, irritation)	44 (73)	06 (12)	41.43	< 0.001
Breathing problem, cough	31 (52)	04 (08)	24.04	< 0.001
Frequent fever	20 (33)	03 (06)	12.46	< 0.001
Asthma	09 (15)	05 (10)	0.723	NS
Anorexia	07 (12)	02 (04)	1.22	NS

CS: control subjects; GW: garment workers; NS: not significant;  $\chi^2$ : Chi-square.

Previous workers found that the "work related" symptoms improved on holidays or on days away from work or that were reported as being worse when working [15]. There were a variety of respiratory disorders recognized in workers exposed to organic dusts including cotton. The chronic respiratory symptoms were acute airway responses such as cough, wheeze, shortness of breath, and acute lung function. We found that a highly significant (p<0.001) proportions of garment workers suffered from skin rash and itch (73%), respiratory problems (52%) involving the upper and lower respiratory tract, and frequent fever (33%) compared to the control subjects in other professions (Table 3).

We observed that the prevalence of allergic diseases was common among the garment workers. It has been suggested that allergy is caused by environmental exposure to dust, endotoxin, and multiple fungal and bacterial allergens [16], [17]. In a recent study conducted on the textile processing workers in Nepal showed there was a statistically significant correlation between inhalable dust concentrations and endotoxin concentrations [18]. In the present study, a large number of the garment workers suffered from cough and breathing complications. We have

reported earlier that occupational exposure to cotton dust, fibers, metal fumes and different chemicals used in the apparel manufacturing industries affect the immune function of the garment workers [1].

Measurement of serum IgE levels in the garment workers might have been relevant to investigate relationship between skin manifestations and allergy; however, elevated level of serum IgE is a common feature for the general population in a densely populated tropical country like Bangladesh [19]. It is possible that the garment workers may experience allergic response and occupational asthma due to inadequate ventilation and inhalation of cotton dust, metal fumes and several other chemicals in their working environment. The psychological health problems of the garment workers could be related to their extreme poverty as a result of paltry wages, depression and workload.

Our findings support a previous study conducted in Quebec, which found that the garment workers had an increased prevalence of disability and higher levels of anxiety and depression when compared to workers in other occupations [20]. The results presented in this study clearly demonstrate occupational health problems in the garment workers. Further investigation on a larger sample size would give better insights to the issue. However, on the basis of our findings, we recommend that immediate measures be taken for improving the working environment of the tannery workers in Bangladesh.

## 5. Conclusion

The garment workers suffer from a wide range of occupation-related physical health problems including skin rash and breathing complications; and psychological problems arising from long working hours accompanied by poor wages and job insecurity. These workers also encounter stress-related depression.

## 6. Acknowledgements

We gratefully acknowledge the cooperation and support extended by Mr. M. Aktar Hossain, Bangladesh Medical College Hospital, in helping us collecting samples from the garment workers; the management of the garment factories for their cooperation; and all the participants of this study.

## References

- [1] R. Sultana, K. Ferdous, M. Hossain, M. Zahid, and L. Islam, "Immune functions of the garment workers," *Int J Occup Environ Med.*, vol. 3, pp. 195-200, 2012.
- [2] A. Chand, "Physical and psychological health problems of garment workers in the Fiji," *Pac Health Dialog.*, vol. 13, pp. 65-70, 2006.
- [3] H. Ayer, J. Dement, K. Busch, B. Ashe, B. Levadie, W. Burgess, and L. DiBerardinis, "A monumental study - reconstruction of a 1920 granite shed," *Am Ind Hyg Assoc J.*, vol. 34, pp. 206-211, 1973.
- [4] R. Durvasula, "Occupational health information systems in developing countries - India, a case study," Presented at the IV Takemi Symposium in International Health- Working Populations and Health in the Third World: Problems and Policies. Harvard School of Public Health, Boston, USA, 1990.
- [5] C. Zou, Y. Gao, and Q. Ma, "Pneumoconiosis in China: Current situation and countermeasures," *Asian-Pacific Newsletter on Occupational Health and Safety*, vol. 4, pp. 44-49, 1997.
- [6] K. Teschke, P. Demers, H. Davies, S. Kennedy, S. Marion, and V. Leung, "Determinants of exposure to inhalable particulate, wood dust, resin acids, and monoterpenes in a lumber milling environment," *Ann Occup Hyg.*, vol. 43, pp. 247-255, 1999.
- [7] H. Cowie, S. Lorenzo, and B. Miller, "Estimating the risks of respiratory symptoms amongst workers in the UK wool industry," Report TM/92/07. Inst Occup Med., Edinburgh, UK1992.
- [8] T. Diepgen and P. Coenraads, "The epidemiology of occupational contact dermatitis," *Int Arch Occup Environ Health*, vol. 72, pp. 496-506, 1999.
- [9] L. Brinton, W. Blotm, and J. J. Fraumeni, "Nasal cancer in the textile and clothing industries," *Br J Ind Med*, vol. 42, pp. 469-474, 1985.
- [10] E. Delzell and S. Grufferman, "Cancer and other causes of death among female textile workers, 1976-78," *J Natl Cancer Inst.*, vol. 71, pp. 735-740, 1983.
- [11] J. Olsen and O. Jensen, "Occupation and risk of cancer in denmark. An analysis of 93,810 cancer cases, 1970-1979," *Scand J Work Environ Health*, vol. 13, pp. 1-91, 1987.
- [12] K. Wernli, E. Fitzgibbons, R. Ray, D. Gao, W. Li, N. Seixas, J. Camp, G. Astrakianakis, Z. Feng, D. Thomas, and H. Checkoway, "Occupational risk factors for esophageal and stomach cancers among female textile workers in Shanghai, China," *Am J Epidemiol*, vol. 163, pp. 717-725, 2006.
- [13] B. Sjögren, "Occupational exposure to dust: Inflammation and ischemic heart disease," *Occupational and Environmental Medicine*, vol. 54, pp. 466-69, 1997.
- [14] WHO, *Occupational hazards -5: Anthology on women, health and the environment: WHO/EHG/94.11*, 1994.
- [15] N. Bakirci, S. Kalaca, A. Fletcher, C. Pickering, N. Tumerdem, S. Cali, L. Oldham, H. Francis, and R. Niven, "Predictors of early leaving from the cotton spinning mill environment in newly hired workers," *Occup Environ Med.*, vol. 63, pp. 126-130, 2006.
- [16] Y. Zhong, D. Li, M. Qinyan, and R. Rylander, "Lung function and symptoms among cotton workers and dropouts three years after the start of work," *Int J Occup Environ Health*, vol. 8, pp. 297-300, 2002.
- [17] X. Wang, L. Pan, H. Zhang, B. Sun, H. Dai, and D. Christiani, "A longitudinal observation of early pulmonary responses to cotton dust," *Occup Environ Med.*, vol. 60, pp. 115-21, 2003.
- [18] P. Paudyal, S. Semple, R. Niven, G. Tavernier, and J. Ayres, "Exposure to dust and endotoxin in textile processing workers," *Ann Occup Hyg*, vol. 55, pp. 403-409, 2011.
- [19] L. Islam, A. Nabi, M. Rahman, and M. Zahid, "Association of respiratory complications and elevated serum immunoglobulins with drinking water arsenic toxicity in human," *J. Environ. Sci. Health (Part A)*, vol. 42, pp. 1807-1814, 2007.
- [20] C. Brisson, M. Vézina, and A. Vinet, "Health problems of women employed in jobs involving psychological and ergonomic stressors: The case of garment workers in Québec," *Women & Health*, vol. 18, pp. 49-65, 1992.