

A longitudinal study of the morbidity and nutritional status of workers employed in a garment factory

Bobby Joseph¹, Christie Minj², Glenn Fernandes³, Milan Marandi⁴

ABSTRACT

Objectives: Given the health risks associated with the garment manufacturing industry, it is important to periodically evaluate the health status of these workers. Our objectives in this study were to firstly assess the change in morbidity profile by comparing the recorded ailments of workers in a garment factory in a three year period and secondly to assess the change in their nutritional status (Body Mass Index) over a period of three years.

Methodology: Retrospective cohort study design was used. Data from the periodic health check up for these employees in 2005 and 2002 was compared. Data was analyzed for 187 employees (males 19; female 168) who were present for the health check up of both 2005 and 2002. The chi-square test and comparison of change in percentages were used to determine significance of change in BMI.

Results: Musculoskeletal ailments were the most common health problems in the garment factory. There was an increase in the number of workers with complaints of dental caries, refractive errors and respiratory ailments. There was an increase in the proportions of pre-obese, obese (class 1) and obese (class 2) workers and a decrease in the proportion of those underweight and normal. Analysis showed a significant increase in the Body Mass Index (BMI) of workers who were previously underweight ($p=0.00$), normal ($p<0.001$) or pre-obese ($p=0.03$).

Conclusions: These findings, which are probably related to sedentary occupation, call for regular monitoring of BMI as well as dietary and lifestyle interventions for these workers. The findings also answer the call for factory-based interventions to improve workers' health.

KEY WORDS: Garment industry, Workers, Nutritional status, Morbidity.

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INTRODUCTION

Workers in garment manufacturing establishments are at considerably higher risk for developing problems such as physical and psychological ailments and repetitive strain injury owing to repetitive motions and fast work speeds.¹ During annual medical examinations of workers in some garment factories it was observed that some workers were showing a tendency to an increase in their Body Mass Index (BMI). An attempt was therefore made to document and analyze these data. The objectives of the study were (1). To assess the change in morbidity profile by comparing the recorded ailments of workers in a garment factory between 2002 and 2005. (2). To assess the change in their nutritional status (Body Mass Index) over a period of three years.

1. Prof. Bobby Joseph, MD, DNB,
 2. Dr. Christie Minj, MD,
 3. Dr. Glenn Fernandes, MBBS,
 4. Dr. Milan Marandi, MBBS,
- 1-4: Department of Community Health,
St. John's Medical College,
Bangalore, India.

Correspondence:

Prof. Bobby Joseph, MD, DNB,
Professor, Community Health,
Division of Work Environment,
St. John's Medical College,
Bangalore-5600764,
India.
E-mail: joseph.bobby@gmail.com

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METHODOLOGY

The data from the case files of the annual health examination held in May 2002 and August 2005 for the employees of a garment factory in Bangalore was analyzed for this retrospective cohort study. Nutritional status as assessed by the Body Mass Index (BMI) was also compared for these years and analyzed for significant alterations. Analysis was done using the statistical package Epi Info 6. Proportions (percentages) of common ailments were considered. The chi-square test and comparison of change in percentages were used to assess significance in the change in the BMI in the year 2005 as compared to 2002.

In the intervening period of three years, the factory had established a system of providing the workers with a primary care provider (nurse and visiting doctor), regular health education programmes and a lunch meal at subsidized cost.

RESULTS

A total of 551 employees (males 85; female 466) were examined in 2005 of which 187 employees (males 19; female 168) were present for the health check up of both 2005 and 2002. Comparisons were made for the morbidity profile of these 187 employees in 2005 and 2002.

Musculoskeletal problems which included problems such as pain in the back, legs and shoulders and the carpal tunnel syndrome, although slightly decreased were still the most common problems (about 48% in 2002 and 40% in 2005) among the workers in this garment factory. Ophthalmologic problems (refractive errors, eye irritation increased from about 14% to 21%. Among women,

Table-I: Comparison of Nutritional Status in 2002 and 2005.

Nutritional Status	B.M.I (kg/m ²)	2002 n (%)	2005 n (%)
Underweight	<18.5	31 (16.58)	22 (11.76)
Normal	18.5-24.99	116 (62.03)	106 (56.68)
Pre - Obese	25-29.99	27 (14.44)	40 (21.39)
Obese Class 1	30-34.99	12 (6.42)	16 (8.56)
Obese Class 2	35-39.99	1 (0.53)	3 (1.60)
Obese Class 3	>40	0	0
Total		187 (100)	187 (100)

Chi-square=5.817 (df=4), p=0.2132

gynecological problems showed an increase of 5.35%. These included menstrual irregularities, polycystic ovaries, vaginal discharge, infertility, cancer cervix, uterine prolapse and urinary tract infections. Both respiratory illnesses (rhinitis, respiratory infections, bronchitis, bronchial asthma) and thyroid related illnesses increased by 2.14%. Both cardiovascular illnesses and hypertension increased by 0.53%. Neurological ailments such as hand tremors, peripheral neuritis and headaches showed a prevalence of around 12% in the both the years. The prevalence of anemia was around 8% in both the years.

When comparing the nutritional status of these workers it was observed that most had a normal BMI both in 2002 and 2005. However there has been an increase in the proportion of workers who belong to the category of Pre-obese, Obese-class 1 and Obese-class 2. (Table-I). The increase in the BMI is statistically significant for all those who previously belonged to the categories of Underweight, Normal, Pre-obese and Obese-class 1. (Table-II)

DISCUSSION

Table-II: Change in Nutritional Status from 2002 to 2005.

2002	N	2005	n(%)	Remarks
Underweight	31	Normal	14 (45.16)	X ² =18.1 (df=1) P=0.000
		Underweight	17 (54.84)	
Normal	116	Underweight	5 (4.31)	X ² =147.91 (df=2) P<0.001
		Normal	88 (75.86)	
		Pre-obese	23 (19.83)	
Pre-obese	27	Normal	4 (14.81)	X ² =7 (df=2) P=0.03
		Pre-obese	13 (48.15)	
		Obese class 1	10 (37.04)	
Obese class 1	12	Pre-obese	4 (33.33)	
		Obese class 1	6 (50)	
		Obese class 2	2 (16.67)	
Obese class 2	1	Obese class 2	1 (100)	

A large proportion of workers were found to have musculoskeletal problems. Workers in garment factories are known to have musculoskeletal problems particularly low back pain. This is due to work involving fixed, sedentary postures.² Particularly vulnerable are sewing machine operators, in whom work related musculoskeletal disorders have been reported to occur at high rates and exposure response trends have been observed for physical exertion and pain.³ Occupational and work associations with pain in the shoulder, arm and hand have been recognized for almost 300 years.⁴ Workers in the garment industry are at an increased risk for carpal tunnel syndrome.⁴ The introduction of an ergonomics program focused on education and introduction of adjustable chairs may diminish musculoskeletal symptomatology.⁵ Education would need to focus on proper work posture and adequate rest/stretching exercises in between prolonged sitting/standing.

A number of workers had ophthalmological complaints including refractive errors and irritation in the eyes which could probably be linked to continuous fine work. Although a lot of workers are employed in jobs requiring them to stand for several hours, there has been only one case of varicose veins recorded in both the years. Allergic rhinitis remains the most common respiratory ailment and could be explained by allergy to fibre dust among workers involved in cutting and trimming operations. Neurological problems, particularly headache, have been recorded in 12% of the workers in both the years. In the garment industry an increased mental workload may represent a source of psychological stress.¹

The assessment of the nutritional status of these workers shows an increasing BMI and the increase is most marked in the pre-obese category (Table-I) pointing to the need of immediate interventions such as education regarding lifestyle modification. Comparing the change in percentages, it was found that there has been a significant increase in the BMI of workers who were previously underweight, normal or pre-obese (Table-II). Sedentary life style and sedentary occupation are known to promote obesity⁶

and the lack of physical exercise as well as long work hours could have contributed to the increasing BMI among these workers. Regular monitoring of weight and BMI as well as specific advice on dietary changes and increased physical activity would go a long way in preventing the development conditions such as diabetes, hypertension, and coronary heart disease among these workers.

On a positive note the multi-pronged interventions undertaken by the factory appear to have a definite role to play in the reduced morbidity and the "improved" nutritional status of the workers. This finding adds credibility to the call for factory based interventions, especially in developing country settings.

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Authors' Contribution:

BJ – conceived and designed the study, supervised the data collection.

CM – did the data collection and statistical analysis and edited the manuscript.

GF and MM – conducted the data collection and drafted the manuscript.