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# Occupational Health Problems of Garment Workers

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**Abstract**—The garment is one of the many labour-intensive sectors that provide a gateway for developing countries to the global market. The garment industry contributes 16.63% to the foreign earnings of India and it employs over 3.5 million workers. The workers in these industries are employed mainly in three different sections namely cutting, stitching and finishing of garments. The present study was taken up in Tirupur district which is situated in the Western Tamil Nadu. Garment production in Tirupur, also known as “T-shirt city”, accounts for 80% of India’s total production of knitwear for export. An interview schedule was framed regarding garment workers’ socio-economic background, job history, health problems related to work and other health problems and accidents at worksite. Five hundred and fifteen workers employed in 13 large, medium and small scale garment units were surveyed. The mean age of garment workers was 30 years ( $\pm 8.7$ ). Both male (57%) and female (43%) workers were employed equally. Majority of the moderate discomforts were experienced in lower extremities such as leg (99.8%), feet (95.8%) and knees (95.3%) followed by upper extremities such as upper back (85.8%), low back (66.2%), mid back (65.5%), shoulders (65.5%) and neck (55%) respectively. There was a strong association between the musculoskeletal discomforts (neck, shoulders, upper arm and lower arm) and the sections (cutting, stitching and finishing) in which garment workers were employed. Further when occupational risks factors of garment workers were compared with health problems, significant difference at two per cent level and one per cent level were found.

**Keywords:** *Garment industry, knitwear, musculoskeletal discomforts, health problems, accidents.*

## I. INTRODUCTION

The whole supply chain in garment production process normally involves cotton production, spinning, knitting, dyeing and finally stitching. The focus of the study is at the supplies level and on the last production unit where the actual garment is manufactured [1]. The garment industry contributes 16.63% to the foreign earnings of India and it employs over 3.5 million workers. There are five different garment production hubs such as Delhi, Mumbai, Tirupur, Bangalore and Chennai in India; all specialize in different types of garment production [2]. Garment production in Tirupur, also known as “T-shirt city”, accounts for approximately 80 per cent of India’s total production of

knitwear for export [3]. Estimates suggest that there are about 10,000 workers, but numbers may be higher than this. Much of the labour force consists of commuters from the region, long-distance migrants (mainly recruited from the southern districts of Tamil Nadu), and increasingly migrant workers coming from as far as Manipur and Nagaland in the north-east [4]. Garment factory work comprises layout cutting, stitching, and finishing activities which are repetitive and monotonous, involving long hours sitting or standing in one position. Health problems among garment workers range from discomfort and minor aches and pains, to more serious medical conditions requiring time off work and even medical treatment. In more chronic cases, treatment and recovery are often unsatisfactory – the result could be permanent disability and loss of employment [5].

Of the large number of the workers who complained of their occupation being the cause of their health problems, a majority reported [6]-[7] these to be musculoskeletal problems with backache being predominant among these. The most frequent sources of workers’ injuries in the garment industry are: insecure way of work, violation of the safe work regulations, machines with some defects, tiredness caused by monotonous work and insufficiency or lack of personal or collective protective means [8]. Garment industry is one of the most competitive industries in the world as manufacturers compete on price and quality. This leads to reduce their cost of production (including wages) and at the same time get the maximum out of the workers. This competition leads to intensification of work, which in turn has impact on the health of workers. This paper thus examines some of the health problems faced by garment workers employed in Tirupur garment industries. The aim of the study was to assess the health hazards of garment workers employed in selected garment industries in Tirupur.

## II. METHODOLOGY

The study was taken up in Tirupur district which is situated in the Western Tamil Nadu. The objectives of the study were explained to the workers of garment industries. They agreed to participate in the study either

before/after work hours or during lunch hours. Thus 515 workers employed in 13 large, medium and small scale garment industries participated in the study. The study tool consisted of predesigned and pretested interview schedule with questions regarding their socio-economic condition, their occupation history, their body parts that experience discomfort, their health problems and accidents at worksite. The data thus collected were analysed using SPSS 11.0.

### III. RESULTS AND DISCUSSION

The demographic features of five hundred and fifteen garment workers are presented in Table I.

TABLE I: DEMOGRAPHIC FEATURES OF THE GARMENT UNIT WORKERS

S. No.	Particulars	Frequency (n=515)	Percentage
1	Age (years)		
	Up to 20	74	14.4
	21-30	214	41.6
	31-40	171	33.2
	41-50	44	8.5
	Above 50	12	2.3
2	Sex		
	Male	295	57.3
	Female	220	42.7
3	Marital status		
	Married	311	60.4
	Unmarried	196	38.1
	Divorced	1	0.2
	Widow	7	1.4
4	Education		
	Illiterate	54	10.5
	Primary	91	17.7
	High school	291	56.5
	Higher secondary	63	12.2
	College	16	3.1
5	Type of family		
	Nuclear	333	64.7
	Joint	182	35.3
6	Community		
	Backward	298	57.9
	Most backward	153	29.7
	Schedule caste	52	10.1
	Schedule tribe	12	2.3
7	Religion		
	Hindu	468	90.9
	Christian	18	3.5
	Muslim	29	5.6

The mean age of garment workers was 30 years ( $\pm 8.7$ ). Above half of the workers (57%) were male and (43%) were female. This may be due to insufficient income of the head of the family which necessitate women and also sometimes children to work among garment industries [9]. Sixty per cent of workers were married. Fifty seven per cent of the workers had high school education, followed by primary school level education (18%), higher secondary level education (12%), illiterate (10%) and only three per cent had college level education. More than half of the workers (65%) were from nuclear family and 35% were from

joint family. In the current familial scenario, the nuclear family system of living is gaining importance drastically irrespective of their economic status. Nearly half of the workers (58%) belonged to medium family with four to six members. Fifty eight per cent of the workers were backward community followed by most backward community (30%), schedule caste (10%) and only two per cent schedule tribe. Majority of the workers (91%) were Hindu. The garment workers' details of occupation history are presented in Table II.

TABLE II: OCCUPATION HISTORY OF GARMENT WORKERS

S.No.	Particulars	Frequency (n=515)	Percentage
1	Nature of work		
	Cutting	53	10.3
	Stitching	246	47.8
	Finishing	216	41.9
2	Hours of work per day in regular days		
	8-10	41	8.0
	11-12	406	78.8
	Above 12	68	13.2
3	Hours of work per day in peak days		
	11-12	37	7.2
	12-15	14	2.7
	Above 15	464	90.1
4	Age of entry (Years)		
	10-15	92	17.9
	15-20	292	56.7
	21-25	69	13.4
	26-30	26	5.0
	Above 30	36	7.0
5	Work experience (Years)		
	Up to 10	301	58.4
	11-20	148	28.7
	21-30	47	9.1
	31-40	19	3.8
6	Type of employment		
	Permanent	211	41.0
	Temporary	304	59.0
7	Mode of payment		
	Piece rate	172	33.4
	Shift	343	66.6
8	Wages per week (Rs.)		
	Up to 1000	271	52.6
	1001-1500	157	30.5
	Above 1500	87	16.9

The whole process in garment industry is categorized into three sections namely cutting, stitching and finishing. The cutting section include pattern making of fabric and its layout cutting while finishing section include checking of stitched fabric for damaged one, ironing and packing of garments. Working in stitching and finishing section was more or less equal. The former had 48% and the latter 42%. Only 10% of workers were engaged in cutting section. On record, a shift companies eight hours of work, but in actual terms it is twelve hours, that is one-and-a-half shift. In other words, the regular working day is from 8.30 AM till 5.30 PM, six days a week. On top of this there is usually overtime. 'Normal' overtime is three hours per

day. During peak season for work namely in September, October, November and December, the workers would work night shifts too until 1.30 AM. Low season for work is February and March.

The mean age of entry of workers was 19 years ( $\pm 5.8$ ). The young workforce is mainly due to the prevalence of Sumangali Scheme and child workers. A study [10] reported that adolescent, unmarried young girls of 15 to 25 are preferred in the textile and garment industry for their efficiency in work output. Many girls are recruited under the Sumangali Scheme – earning dowry money for the girls' future marriages. Ranging in age from eight to 14 years old, migrant child workers are employed mainly as helpers, primarily in subcontracting production units. When parents are unable to find work, their children help support the family [11]. The mean age of work experience was found to be 10 years ( $\pm 8.7$ ). Fifty eight per cent of the workers had up to 10 years of work experience and followed by 29% between 11 years and 20 years. Due to contract system, most of the workers often shift from one garment industry to another.

Hence their employment is naturally temporary. Exception is seen in some export garment industries where they are employed permanently. The mode of payment is either shift or piece-rate and paid weekly. Any additional bonuses or incentives, like attendance bonus, productivity bonus and incentive for reaching the target are not provided to the workers. Deepavali festival bonus is the only exception. Bonus is calculated on their basic pay, it varies from company to company. Eligibility for the bonus is that the workers must have worked for a minimum of four months. Minimum bonus is 8% and the maximum is 30% and most of the companies are giving the bonus as 20% on an average. However, many of the employers are evading payment of bonus by providing false information that the company is running in loss. Only in export garment industries, workers are motivated to enrol themselves in Provident Fund and Employee's State Scheme (ESI), which offers health and insurance benefits.

Musculoskeletal Disorders (MSDs) include a wide range of inflammatory and degenerative conditions affecting the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels [12]. Occupations with maintained postures and repetitive work tasks have been related to neck and shoulder complaints [13], while lower back trouble is commonly associated with heavy physical work, lifting, and motor vehicle driving [14]. Survey of occupational health profile shows various occupational hazards among garment workers. Table III shows discomforts as reported by the workers.

TABLE III: DISCOMFORTS OF WORKERS

S. No.	Body Parts	Percentage of Workers (n=515)		
		Mild Discomfort (%)	Moderate Discomfort (%)	Severe Discomfort (%)
1	Neck	45.0	55.0	-
2	Shoulders	43.5	56.5	-
3	Upper back	14.2	85.8	-
4	Mid back	34.5	65.5	-
5	Low back	33.8	66.2	-
6	Buttocks	97.7	2.3	-
7	Thighs	49.2	50.8	-
8	Knees	4.7	95.3	-
9	Leg	0.2	99.8	-
10	Feet	4.2	95.8	-
11	Upper arm	50.7	49.3	-
12	Lower arm	51.1	48.9	-
13	Wrists	96.9	2.7	0.4
14	Palm	96.3	2.5	1.2
15	Fingers	92.4	5.1	2.5

It has been observed that almost all the workers have developed discomfort in various body parts. Majority of the moderate discomforts were experienced in lower extremities such as leg (99.8%), feet (95.8%) and knees (95.3%) followed by upper extremities such as upper back (85.8%), low back (66.2%), mid back (65.5%), shoulders (65.5%) and neck (55%) respectively. Production sewing is a highly repetitive, high precision task that requires the worker to lean forward to see the point of operation, while simultaneously using the hands to control fabric feed to the needle, and continuously operate foot and knee pedals. While the workers carry out work in sections of cutting and finishing by standing for prolonged hours. All these lead to musculoskeletal discomforts among workers [15]. The results of the present study are in agreement with a study [16] among Taiwan workers. They reported musculoskeletal disorders of body parts like neck, shoulders, hands and wrists.

Chi-Square ( $\chi^2$ ) test was used to find the association between discomforts of neck, shoulders, lower arm and upper arm with nature of work namely cutting (Cu), stitching (St) and finishing (Fi) respectively. Table IV represents the relationship between musculoskeletal discomforts of garment workers and nature of work they are engaged in. The results of Chi square analysis clearly indicate a strong association between the musculoskeletal discomforts (neck, shoulders, upper arm and lower arm) and the sections (cutting, stitching and finishing) in which garment workers were employed. The same findings were observed in another study [17] where musculoskeletal disorders were common among those who were engaged in cutting and sewing ( $\chi^2=6.38$ ;  $p=0.0412$ ,  $df=2$ ) sections.

TABLE IV: RELATIONSHIP BETWEEN DISCOMFORTS AND NATURE OF WORK

S. No.	Discomforts	Nature of Work			$\chi^2$ Value
		Cu (%)	St (%)	Fi (%)	
1	Neck				10.44**
	Mild	32.1	52.0	40.3	
	Moderate	67.9	48.0	59.7	
2	Shoulders				18.03**
	Mild	20.8	51.2	40.3	
	Moderate	79.2	48.8	59.7	
3	Upper arm				18.33**
	Mild	32.1	59.8	44.9	
	Moderate	67.9	40.2	55.1	
4	Lower arm				17.45**
	Mild	32.1	59.8	45.8	
	Moderate	67.9	40.2	54.2	

\* $p < 0.05$ , \*\* $p < 0.01$ , NS: Non-significant

Health problems were also found among garment workers. ANOVA and t test were used to compare workers' occupational risk factors (age, sex, work experience and nature of work) with health problems neural problems (NP) such as headache, respiratory problems (RP) such as breathing difficulty and asthma, problems with sense organs (SO) such as dermatological, cornification, hearing disability and eye problem, gynaecological problems (GP) such as regular menstruation and miscarriage and other health problems (OP) such as generalised weakness, swelling of feet, insomnia, poor oral health, palpitation, chest pain, constipation, piles, acidity and heart burn). Table shows the comparison of workers' occupational risk factors and their health problems.

According to the statistics, the most frequent causes of workers' injuries in the garment industry are: insecure way of work, violation of the safe work regulations, keeping working places untidy, bad work organisation, machines with some defects, tiredness caused by monotonous work and insufficiency or lack of personal or collective means.

There have been a few reports of accidents in the garment industry from the world over. In Thailand, a study on health promotion in the garment industry revealed that many workers ignored using any safety device at work, and managed stress improperly [19]. In few studies in Sri Lanka it was shown that most accidents are considered by employers to be minor, e.g. repetitive strain injury or needle stick injuries [20]. It was also found during this study that in the past most of these accidents -are not reported in the factory register and that the workers are unaware of any accident register.

TABLE V: COMPARISON OF WORKERS' OCCUPATIONAL RISK FACTORS AND HEALTH PROBLEMS

S.No.	Risk Factors	Health Problems				
		NP	RP	SO	GP	OP
(Mean)						
1	Age (Years)					
	Up to 20	2.14	3.34	4.24	4.62	17.00
	21-30	2.46	3.43	4.71	4.36	18.47
	31-40	3.41	4.96	6.02	4.30	19.97
	41-50	3.82	7.30	7.00	4.23	22.02
	Above 50	4.00	8.50	9.25	3.00	23.08
	F value	60.77	79.63	55.96	1.26	49.57
Significant	**	**	**	NS	**	
2	Sex					
	Male	2.77	4.20	5.56	NA	19.30
	Female	3.04	4.60	5.14		18.99
	t value	2.93	2.10	2.51		1.25
	Significant	**	*	*		NS
3	Work experience (Years)					
	Up to 10	5.30	7.70	9.73	8.63	37.14
	11-20	6.16	8.90	11.75	8.78	39.32
	21-30	3.61	6.00	6.16	3.75	21.00
	31-40	3.89	7.77	7.97	4.00	22.26
	F value	19.58	36.21	31.19	0.78	23.42
	Significant	**	**	**	NS	**
4	Nature of work					
	Cutting	7.92	13.37	16.75	5.00	57.3
	Stitching	2.71	3.87	5.11	4.70	18.53
	Finishing	9.14	14.37	16.77	10.15	11.63
	F value	4.04	5.55	5.40	2.81	8.95
	Significant	**	**	**	*	**

NA: Not Applicable

\* $p < 0.05$ , \*\* $p < 0.01$ , NS: Non-significant

The details of occurrence of accidents in the present study are represented in Table VI.

TABLE VI: OCCURRENCE OF ACCIDENTS AT WORKSITE

S. No.	Accidents	Nature of Work		
		Cu (%)	St (%)	Fi (%)
1	Needle piercing	2.1	45.6	-
2	Hands getting caught in the wheel	3.4	45.6	-
3	Electric shock	11.1	41.6	37.3
4	Trimmer piercing the palm	-	-	27.6
5	Cutting the finger tips	11.7	48.2	31.3
6	Burns and scalds	-	-	35.7
7	Hand and wrist injury by ticketing guns	0.2	-	3.3
8	Cornification	14.9	10.1	-

#### IV. CONCLUSION

The paper clearly throws light on the occupational health problems faced by workers employed in Tirupur garment industries. Musculoskeletal problems were the commonest health problem detected in the present study. The study also showed that there were significant associations between certain occupational health risk and the incidence of occupational health problems. Safety and health measures play an important role in any industry. It is essential that the workers be aware of

the various occupational hazards in the industry. At the same time, it is necessary that the management take the necessary steps to protect workers from potential hazardous situations.

The following suggestions can be made to improve the safety and health conditions in garment industries:

- The seats of the workers and the tables should be well aligned in height so that there is no postural stress.
- There should be proper lighting at the place of work so that eyestrain can be avoided.
- There should be proper ventilation at the place of work.
- Workers should be provided with personal protective equipments.
- Trained medical personnel and first aid facilities as well as safety equipments such as fire extinguishers and fire alarms should be available at the place of work.
- Medical examinations should be conducted by the employers for the workers from time to time. If significant occupational health problems are observed, appropriate measures should be taken by the management.

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