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Prevalence of Musculoskeletal Disorders among the Bangladeshi Garments Workers

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Abstract

Disorders of the musculoskeletal system are the single largest group of work-related illness in the developing and developed world. Sedentary working style with wrong posture for long time can be important risk factor for the development of this disorder. Substantial number of Garment workers in Bangladesh suffered from musculoskeletal disorder.

The aims of the study were to determine the prevalence and find out the factors associated with musculoskeletal disorders among the garments workers. A total of 150 garments workers (where 60.7% were female) from Dhaka city (mean age- 25.2±4.8 years) were screened out in a cross-sectional study. Oxford muscle grading scale and Four point pain index have been used for the measurement of pain and muscular weakness.

Among the respondents suffering from pain, the prevalence of musculoskeletal disorder was found in 60.7% whereas 10.0% had muscular weakness in different part of the body.

Gender ($p < 0.005$), age ($p < 0.036$) and marital status were significantly associated, however body weight ($p < 0.07$) and education ($p < 0.062$) were closely associated with this disorder.

Almost two third of the garment workers were suffering from musculoskeletal disorders where gender, age, body weight, marital status and education can be associated factors.

Introduction

Readymade Garment (RMG) sector plays an important role in the overall economic development of Bangladesh. Presently, approximately 20 lakh workers (among which 80% is female) are working in this sector which is a great source of employment ¹. It is also mentionable that about 76% of the foreign exchange is earned by this sector ². The garment industry of Bangladesh has been expanding rapidly since late 1970s ³. As new industries expand, the labour force grew with the economy of the country, at the same times the health hazards for those workers present there in various occupational diseases and accidents highly prevailed among the workers. Occupational health hazard is concerned with health hazard in relation to work environment. The science of occupational health hazards covers a wide field, like work physiology, occupational hygiene, occupational psychology, occupational toxicology etc ⁴.

“Musculoskeletal disorders” include a wide range of inflammatory and degenerative conditions affecting the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels. These include clinical syndromes such as tendon inflammations and related conditions (tenosynovitis, epicondylitis, bursitis), nerve compression disorders (carpal tunnel syndrome, sciatica), and osteoarthritis, as well as less well standardized conditions such as myalgia, low back pain and other regional pain syndromes not attributable to known pathology. Body regions most commonly involved are the low back, neck, shoulder, forearm, and hand, although recently the lower extremity has received more attention. Musculoskeletal disorders (MSDs) are widespread in many countries, with substantial costs and impact on quality of life. Although not uniquely caused by work, they constitute a major proportion of all registered and/or compensable work-related diseases in many countries. Accurate data on the incidence and prevalence of musculoskeletal disorders are difficult to obtain, and official

statistics are difficult to compare across countries. Nevertheless, MSDs are the single largest category of work-related illness, representing a third or more of all registered occupational diseases in the United States, the Nordic countries, and Japan ^{5,6,7,8}. MSDs occur in certain industries and occupations with rates up to three or four times higher than the overall frequency. High-risk sectors include nursing facilities; air transportation; mining; food processing; leather tanning; and heavy and light manufacturing (vehicles, furniture, appliances, electrical and electronic products, textiles, apparel and shoes) ⁵.

Disorders of the musculoskeletal system are the single largest group of work related illness in the developed world ⁹. The number of studies shows that musculoskeletal problems, diseases of the respiratory system and eye, accidents, injuries, skin diseases, stress, insomnia, etc. are all common among the garments workers. The ill health is compounded by various socioeconomic factors such as poverty, lack of education, poor working conditions, excess working hours, and poor diet ¹⁰. Work provides income and thus contributes to a better socioeconomic condition which, in turn, is related to good health. However, the work environment exposes many workers to health hazards that may result in injuries, respiratory diseases, cancers, musculoskeletal disorders, reproductive disorders, cardiovascular diseases, mental and neurological illnesses, eye damage, and hearing loss, as well as communicable diseases. Musculoskeletal problems were the commonest health problem detected in the study population. This may be explained by the fact that their work required them to remain in a bent position for many hours at a stretch, often in an overcrowded, ill-ventilated, and poorly illuminated room. The neck was the commonest anatomical area to be affected. Similar findings were reported by the Canadian Women's Health Network, with musculoskeletal disorders being the most common hazard in women engaged in sewing and the neck being the most commonly affected part, followed by the low back ¹¹.

From 1996 to 2000, the Union of Needle trades Industrial and Textile Employees created a union-based health program to provide more timely access to medical treatment for garment and textile workers in New York. Investigators at New School University Health Policy Research Center conducted a descriptive evaluation of the project. The evaluation also described the patient population, their work-related injuries and the impact of these injuries on income and their medical benefits. The union implemented the system in 1996. According to the project director, since 1999 approximately 1,000 injured workers each year have

received medical treatment for workplace injuries through the center or its participating outside providers. Carpal tunnel syndrome was the top diagnosis for both the garment workers and the computer users. Other common work-related conditions included forearm tendonitis, lateral epicondylitis (i.e., tennis elbow), neck tension and wrist/digit tendonitis ¹². Though out the India, now consider a major power and is turning into a developed country from a developing country, a large section of its population still belong to the poorest of the poor.

In developing countries, great efforts are directed towards the advancement of small-scale industries as these are considered the engine for their economic growth. According to WHO, over 1000 million people worldwide are employed in small-scale industries ¹³. Workers with high physical work demands are well documented to be at elevated risk for impaired work ability, musculoskeletal disorders, cardiovascular disease, all-cause mortality, long term sickness absence and early retirement from the labour market. Specifically, prolonged standing, highly repetitive work, heavy lifting, working with the hands lifted to shoulder height or higher, and working with the back twisted or bent forward are physical exposures, that have been shown to predict impaired work ability, musculoskeletal disorders and enhance long term sickness absence. Therefore, workers in job groups exposed to these physical factors at work are at particular need for health promoting initiatives for preserving or improving their work ability ¹⁴.

The prevalence of musculoskeletal problems amongst these Sri Lankan garment workers was quite low, with just a handful of sewing machine operators reporting upper extremity or neck pain. This is surprising as the garment industry typically carries one of the highest rates of neck and shoulder pain relative to other manufacturing fields ¹⁵.

Stress at work is a growing problem for all workers, especially women. Many of the job conditions, along with the problem of balancing work and family issues, contribute to stress in the workplace ¹⁶.

The aims of the study were to determine the prevalence and to find out the factors associated with musculoskeletal disorder among the garments workers.

Methods and materials

Under an analytical cross-sectional study design a total of 150 (male-39.3% and female-60.7%) respondents have been assessed from the different selected garments at Mirpur area of the Dhaka city. Sampling technique was simple random for the selection of the respondents but in case of selection of the garments it was purposive. The age range of the respondents was 18-40 years; all of the respondent's position was sewing machine operator; the respondents who had not any history of MSDs before starting the present job and who had been working for at least 6 months in the same position were selected for the study population. Respondents who had a history of trauma due to any accident, who were pregnant (for female respondents), under gone any operative procedures for at last 3 months ago were excluded from the study. An interviewer administered structured pretested questionnaire and check-list has been used which was consisted 2 sections, the first section was included questions on socio-demographic characteristics and background information of the respondents like; sex, age, occupation, years of work, hours spend in garments per day and week; and the second section was included questions related to work station; like working duration, seat condition, height of the machine etc.. In case of dependent variable, musculoskeletal disorders associated musculoskeletal pain, pain severity, treatment seeking behavior and knowledge of preventive measures etc has been assessed. In case of musculoskeletal problem, only pain of different regions of the body and muscle weakness was assessed. Data collection procedure was face-to-face interview with the interviewers and the respondents and physical examination. Four point pain index scale (0=No pain, 1=Mild pain, 2=Moderate pain, 3=Severe pain) was used for the measurement of pain and oxford muscle grading technique was used for the detection of muscle weakness. An appropriate univariate and bivariate analysis were done accordingly by the statistical software namely SPSS version-16 for Windows. Ethical approval was taken from the ethical review board of State College of Health Sciences and Ethical Review Committee of Bangladesh Diabetic Association (BADAS). Both written and verbal consent was taken and respondents were free to withdraw themselves at any stage of the study.

Results

Table 1: Distribution of the respondents according to the Sociodemographic characteristics (n=150)

| Variables | Number (n) | Percentage (%) | Mean±SD |
|------------------------------|-------------------|-----------------------|----------------|
| Age | | | |
| 15-30 years | 132 | 88% | 25.2±4.8 |
| 30 -45years | 18 | 12% | |
| Sex | | | |
| Male | 59 | 39.3% | |
| Female | 91 | 60.7% | |
| Height cm | | | 155.5±10.1 |
| Weight kg | | | 49.2±6.6 |
| Marital status | | | |
| Married | 101 | 67.3% | |
| Unmarried | 49 | 32.7% | |
| Family members | | | 4.83±1.3 |
| Monthly income (BDT±) | | | |
| <5000tk/month | 18 | 12.0% | 7206±2104 |
| ≥5000tk/month | 132 | 88.0% | |
| Education | | | |
| Below primary | 46 | 30.7% | |
| Up to primary | 80 | 53.3% | |
| Up to SSC and above | 24 | 16% | |

The mean (\pm SD) age of the respondents was 25.2 (\pm 4.8) years whereas majority of the respondents (88.0%) age were ranged from 15-30 years. Of the total, 60.7% of the respondents were female. More than two third (67.3%) of the respondents were married. Mean height and weight of the respondents were 155.5 \pm 10.1cm and 49.2 \pm 6.6 kg respectively. The mean(\pm) monthly income was 7206(\pm 2104) taka whereas majority (88.0%) of the respondents had monthly income above 5000.00 taka. Half (53.3%) of the respondents had education up to primary level. Of the total respondents 60.7% had musculoskeletal disorders.

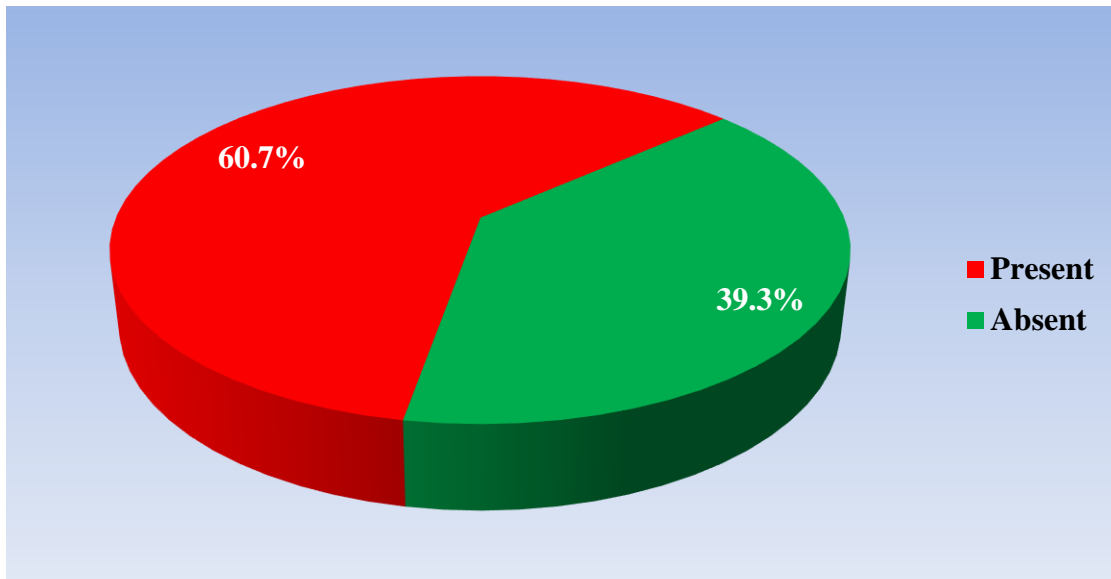


Figure: 1 proportion of the musculoskeletal disorder among the garments workers

All of the respondents who had musculoskeletal disorders had pain in different sites whereas neck-36.7%, Lower back-22.2%, shoulder joint-18.9% and rest of them had pain in elbow, upper back and in hip joint. Regarding pain pattern, majority (81%) of the respondents had temporary pain that's means sometimes in a day they were suffered by the pain whereas 13.0% respondents had continuous pain. Regarding the severity of the pain 38.5% had mild pain, 35.2% had moderate pain and 2.4% had severe pain. The mean duration of pain was 1.97(\pm 4.6) years. Among the total respondents 10.0% had muscular weakness in different sites.

Musculoskeletal disorders were associated with gender ($p=0.005$), age group ($p=0.036$), and marital status ($p=0.017$) respectively whereas education and weight of the respondents had almost significant difference.

The mean working hour was 12.51(\pm 1.5) hours whereas majority of the respondent's machine height was normal and seat was not adjustable for majority of the respondents.

Discussion

In the present study, it has been found that a high prevalence of MSD among garments workers especially among the sewing machine operators. The majority of MSDs were

Table 2: Distribution of the Respondents according to the musculoskeletal disorder (n=150)

| Variables | Number (N) | Percentage (%) |
|---|-------------------|-----------------------|
| <i>Pain</i> | | |
| Yes | 91 | 60.7% |
| No | 59 | 39.3% |
| <i>Site of pain</i> | | |
| Neck | 33 | 36.7% |
| Shoulder joint | 17 | 18.9% |
| Elbow joint | 6 | 6.7% |
| Wrist joint | 2 | 2.2% |
| Upper back | 12 | 13.3% |
| Lower back | 20 | 22.2% |
| Hip joint | 1 | 1.1% |
| <i>Pattern of pain</i> | | |
| Temporary | 73 | 81.0% |
| Continuous | 12 | 13.0% |
| On movement | 6 | 6.0% |
| <i>Severity of pain</i> | | |
| Mild | 35 | 38.5% |
| Moderate | 32 | 35.2% |
| Severe | 24 | 26.4% |
| <i>Duration of pain</i> | | |
| Mean±SD yrs | 1.97±4.612 | |
| <i>Muscular weakness</i> | | |
| Yes | 16 | 10.0% |
| No | 134 | 90.0% |
| <i>Muscular weakness site</i> | | |
| Neck | 1 | 6.3% |
| Shoulder | 3 | 18.8% |
| Elbow | 6 | 41.8% |
| Wrist | 1 | 6.3% |
| Upper back | 5 | 27.0% |
| <i>Duration of muscular weakness (Mean±SD) yrs</i> | | 0.64±3.666 |

perceived as work-related which is comparable with Boschman et al. (2012)¹⁷ follow up study among the construction workers. Sokas et al.¹⁹ compared sewing machine operators to a subset of the general population matched for age, race, and gender and weighted toward lower socioeconomic groups and minority populations. They found that sewing machine operators had a higher prevalence of self-reported upperback and upper-extremity pain.

Table: 3 The socio-demographic factors associated with musculoskeletal disorder

| Variables | Musculoskeletal disorder | | Chi-square | p-value |
|-----------------------|--------------------------|------------|------------|---------|
| | Yes | No | | |
| Sex | | | | |
| Male | 44 (74.6%) | 15 (25.4%) | 7.89 | 0.005* |
| Female | 47(51.65%) | 44 (48.4%) | | |
| Age** | | | | |
| 15-30 years | 76 (57.6%) | 56 (42.4%) | 4.40 | 0.036* |
| 30-45 years | 15(83.3%) | 3(16.7%) | | |
| Height | | | | |
| <155 cm | 33(36.3%) | 26(44.1%) | 0.91 | 0.339 |
| >155 cm | 58(63.7%) | 33(55.9%) | | |
| Weight | | | | |
| <49 kg | 39(42.9%) | 34(57.6%) | 3.12 | 0.077 |
| >49 kg | 52(57.1%) | 25(42.4%) | | |
| Marital Status | | | | |
| Married | 68(74.7%) | 33(55.9%) | 5.74 | 0.017* |
| Unmarried | 23(25.3%) | 26(44.1%) | | |
| Family Members | | | | |
| <5 persons | 65(71.4%) | 43(72.9%) | 0.03 | 0.847 |
| >5 persons | 26(28.6%) | 16(27.1%) | | |
| Monthly Income | | | | |
| <5000 tk | 9(9.9%) | 9(15.3%) | 0.98 | 0.323 |
| >5000 tk | 82(90.1%) | 50(84.7%) | | |
| Education** | | | | |
| Below primary | 23(25.3%) | 23(39.0%) | 7.35 | 0.062 |
| Up to primary | 56(61.5%) | 24(40.7%) | | |
| Up to SSC | 11(12.1%) | 12(20.3%) | | |
| Up to HSC and above | 1(1.1%) | 0(0.0%) | | |

*=Significant (p<0.05)

*=significant, p<0.05 considered as a level of significant, ** Fisher Exact test

Wang et al.²⁰ study results indicate that both personal and work-related factors are associated with the increased prevalence of upper-body WMSDs among sewing machine operators which is also support the findings of the present study. In the present study for musculoskeletal disorders significant differences were found for gender (p=0.005), age group (p=0.036), and marital status (p=0.017) respectively which is also almost similar to Aghili MM et al. (2012)¹⁸ study among the Iranian Sewing machine operators of a shoe manufacturing factory. From the above discussion it can be concluded that sewing operators in different setting and different population is affected equally and need more

appropriate modern technology and technique in terms of operators posture and ergonomics, so that the devastating effect of musculoskeletal disorder among the productive group can be avoided.

Table 4: Distribution of the respondents according to the ergonomic related variables (n=150)

| Variables | Number (n) | Percentage (%) | Mean±SD |
|---------------------------------|-------------------|-----------------------|----------------|
| <i>Height of machine</i> | | | |
| Normal | 113 | 75.3% | |
| High | 33 | 22.0% | |
| Low | 4 | 2.7% | |
| <i>Working time</i> | | | 12.51±1.5 |
| <i>Seat adjustable</i> | | | |
| No | 112 | 74.7% | |
| Yes | 38 | 25.3% | |

Conclusions

Six of every ten respondents are suffering from musculoskeletal disorder among the Bangladeshi garment workers. Pain and muscular weakness was the main complain. This disorder may be associated with age, gender, body weight, marital status and education.

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