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Work-Related Musculoskeletal Disorder an Increasing Concern in Garment Industry

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Abstract

Background: Musculoskeletal Disorders (MSDs)-related occupational health concerns are becoming a growing problem for the clothing industry, which is influenced by the repetitive tasks, prolonged static postures and poor ergonomic conditions that characterise the nature of work in this industry. This study aims to provide a thorough assessment of the numerous musculoskeletal problems that are prevalent in the garment industry and to recommend useful intervention strategies to mitigate their consequences. Methods: One hundred thirty textile workers aged between 25 to 45 years were taken randomly from five different textile manufacturing sites of Baranagar, West Bengal. A modified Nordic musculoskeletal questionnaire was applied to evaluate the postural stress of the garment's workers. The discomfort/pain intensity in different body parts were evaluated by Body Part Discomfort (BPD) scale . Appropriate statistical tests were applied. Results: Discomfort or pain in hip and lower back were found to be maximum among workers. Conclusion: Pain, discomfort and postural stress among various body parts like upper back, lower back and hip are verry much common for the workers. Despite efforts to deal with these problems, more thorough research and efficient intervention strategies are required to reduce musculoskeletal ailments in the garment industry..

Keywords: *Musculoskeletal disorders, garment workers, pain, BPD scoring*

1. Introduction

Millions of people worldwide are employed by the garment industry, which is an important sector. However, due to the nature of the job, employees in this field are at risk for a number of workplace risks, including musculoskeletal disorders (MSDs). In this industry, workers spend a lot of time doing repetitive tasks as sewing, cutting, and assembly. Risk factors related to the workplace can also cause pain, discomfort, and functional impairment (Jagadish et al. 2018).

Some common musculoskeletal disorders observed in the garment industry include: Upper Extremity Disorders, Back Pain, Neck and Shoulder Pain, Lower Extremity Disorders. Workers in the garment industry suffer serious consequences from musculoskeletal issues. Workers experience pain, discomfort, reduced output and diminished quality of life. The garment industry also faces economic consequences due to increased healthcare costs, reduced efficiency, and potential legal liabilities. Research by Biadgo et al. (2018) analysed was the effect of MSDs on the health and well-being of those employed in the garment sector, including pain, disability, reduced productivity, and impaired quality of life, has been documented.

This study's objective is to determine the prevalence and types of musculoskeletal issues among garment industry workers. This involves assessing the frequency and severity of MSDs, as well as the specific body regions affected. The goal of the study is to look into and examine possible risk factors related to MSDs in the garment industry. This includes examining ergonomic conditions, repetitive tasks, awkward postures, forceful exertions, work duration, and other aspects that influence the emergence of MSDs. So, The determine the frequency of MSDs among workers at facilities that produce clothing is the goal of this study. Rapid Upper Limb Assessment (RULA), an ergonomic

assessment tool, will be applied to examine the working postures of manual labourers in small-scale garment and tailoring businesses.

2. Materials And Methods

Subjects

One hundred thirty male textile workers (age: 31.38+3.78 years) were selected at random as participants from five different textile manufacturing sites of Baranagar, West Bengal. The individuals were healthy and had at least two years of experience in the clothing sector. Verbal consent for the study was taken from the subject and they were informed about the detailed the study's protocol.

Daily Work Schedule

The garments workers we surveyed worked mainly in two shifts. One shift was in the morning and the other was in the noon. Morning shift workers work from 10 am to 1 pm. Then they go for their lunch. After lunch afternoon shift the workers work from 2 pm to 6 pm. They used to divide the working duration of eight hours as 3+4 and in between they would take an hour for rest or eat food.

Anthropometric Parameters

A Martin anthropometer and a digital weighing scale were used to measure the subjects' height and weight, respectively. The body mass index (BMI) (Weisell et al., 2002) of all subjects was determined using the formula below:

BMI=Weight in Kg/Height in m2

Questionnaire Study

The postural stress of the garments workers was assessed using a modified Nordic musculoskeletal questionnaire (Kourinka et al., 1987). The survey consisted of a number of questions with multiple-choice answers regarding working conditions and physiological health. Working conditions and duration of work of the workers was assessed using the questionnaire.

Subjective Rating of Discomfort

The discomfort/pain in various body parts were evaluated by Body Part Discomfort (BPD) scale . This scale is marked as '1' to '10' where'1' indicates 'noticeable discomfort' and '10' for 'intolerable discomfort'. '0' on the scale denotes no discomfort at all.

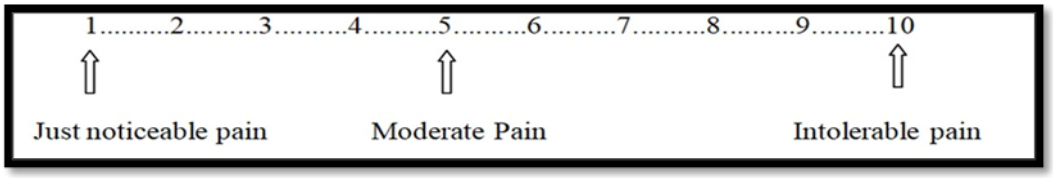

Figure 1: BPD Scale

Statistical analysis

Data were represented as mean ± standard deviation

3. Results and Discussion

Table: 1: Anthropometric parameters of the textile workers (N=130)

Age (Years)	Weight (Kg)	Height (cm)	BMI (Kg/m^2)
31.38±3.78	64.67±5.71	166.38±5.16	23.38±2.01

Anthropometric parameters of the garments worker (N=130) who were participated in this project as Age (years) 31.38±3.78, Weight (kg) 64.67±5.71, Height (cm) 166.38±5.16 and BMI 23.38±2.01 (Table 1).

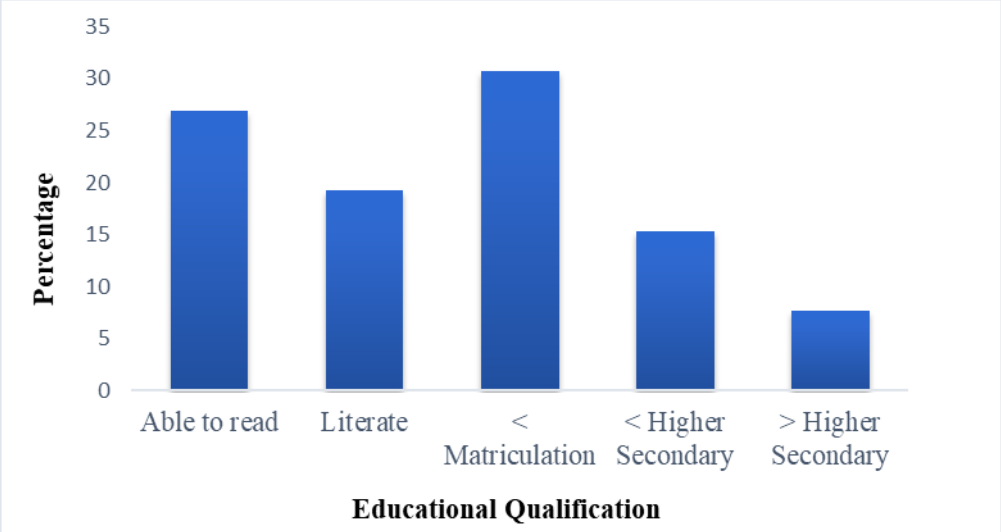

Figure 2 : Education Level of garments workers

The bar graph shows 26.92% workers are able to read, 19.23%workers are literate,30.77% workers are less than matriculation, 15.38% workers are less than higher secondary and 7.69% workers are greater than higher secondary. (Figure 2) According to Bahauddin et al. The participants' average age was 21.89 years, and 77.7% of them were under the age of 25. The majority of participants (27.3%) have completed primary school, with a greater percentage (11.9%) having completed the SSC, 4.2% having completed the HSC, and 0.8% having achieved a degree or higher.

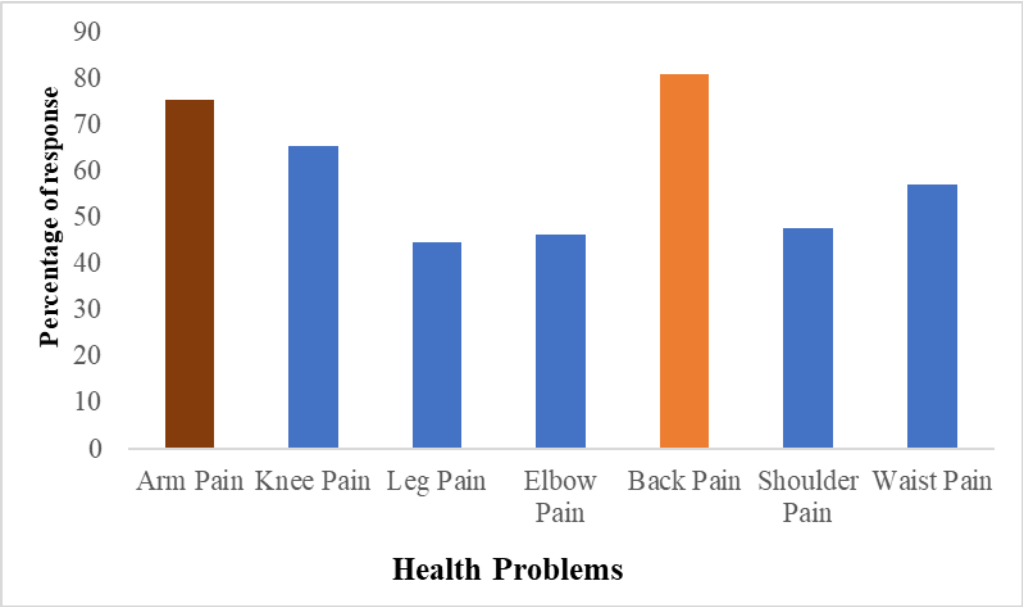

Figure 3 : Assessment of Discomfort level of garments workers during last 7 days

The prevalence of musculoskeletal symptoms is 75.38% for arm pain, 65.38% for knee pain, 44.61% for leg pain,46.15% for elbow pain,80.76% for back pain,47.69% for shoulder pain and 56.92% for waist pain(figure 3).

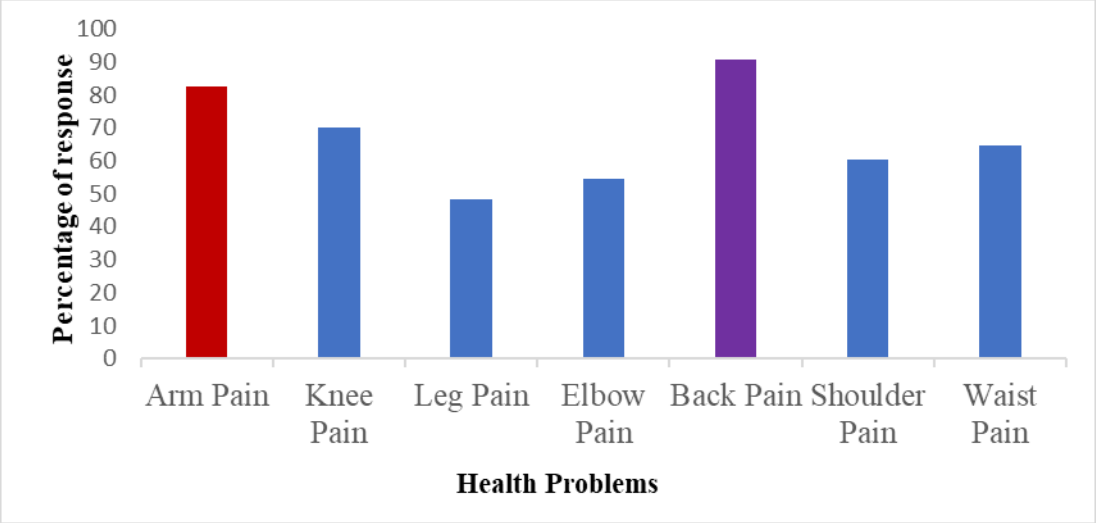

Figure 4 : Assessment of Discomfort Level of Garments Workers during Last 12 months

The prevalence of musculoskeletal symptoms is 82.45% for arm pain, 70.25% for knee pain, 48.32% for leg pain,54.6% for elbow pain,90.72% for back pain,60.42% for shoulder pain and 64.76% for waist pain in last 12 months(figure 4). Fatmawaty et al. show that by 100% of respondents who reported having a full-fledged MSD; The back (59.5%) and the elbows (64.3%) were the body parts with the most complaints.

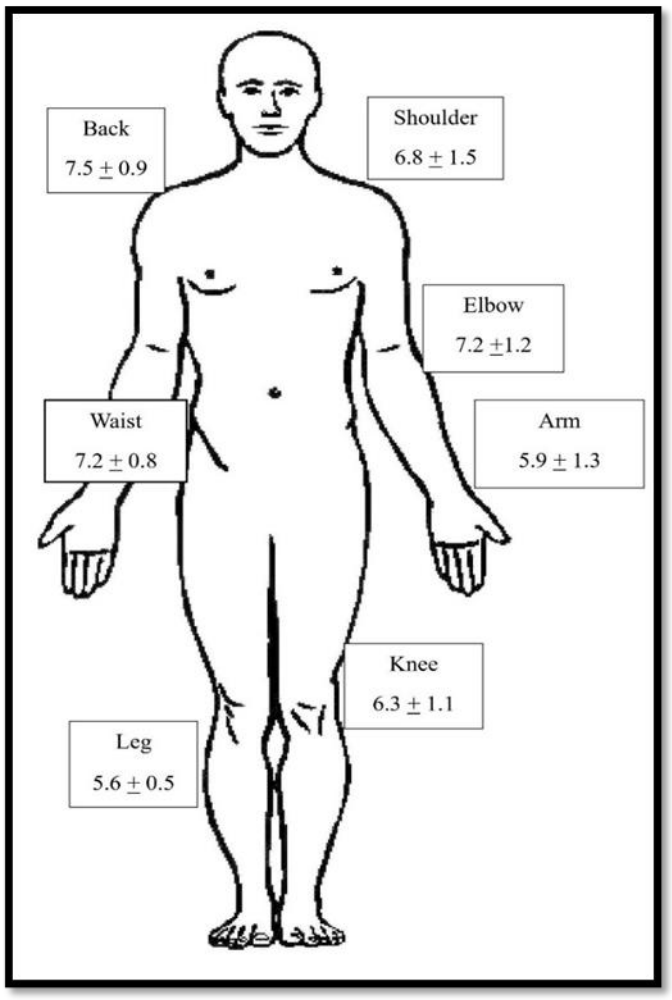

Figure 5 : Body Parts Discomfort Assessment

Body parts discomfort (BPD) scaling of various body parts of garments workers is 6.8±1.5 for shoulder, 5.9±1.3 for arm, 7.5±0.9 for back, 5.6±0.5 for leg, 6.3±1.1 for knee, 7.2±1.2 foe elbow,7.2±0.8 for waist (Figure 5).

The study's primary objective is to identify the factors that affect MSD pain in male garment workers and its pattern. The most frequent issues at work are musculoskeletal disorders (MSDS). It has an

impact on the body's nerves, muscles, joints, tendons, ligaments, and bones. Due to the constant handling of loads, extended standing, repetitive wrist and hand movements, and awkward postures, monotonous job exacerbated worker fatigue.

Since they are primarily immigrants with poor socioeconomic position, low levels of education, and no union representation, A vulnerable group of workers are those who make clothing. We postulated that work-organizational characteristics may be particularly important risk factors for this population since they have no control over employment activities, work schedules, and work-rest patterns. The participants in the present study reported experiencing MSD discomfort at a somewhat high prevalence; with the upper back, hip, and low back pain being the most common sites. An earlier study discovered that self-reported upper back and upper extremity discomfort was more common among sewing machine operators (Aghili et al. 2012).

Most textile employees worked longer than 8 hours each day, which is a critical factor in the development of MSD discomfort. In this study, the majority of participants had 8 to 10 years of job experience. A research by Tusher et al. (2010) found that MSD were more common among people who had worked for a longer period of time and more hours. A significant risk factor for MSD pain is the fact that more than half of the participants worked for more than six hours when standing and sitting. According to prior research, employees who had been working for a longer amount of time were less likely to sustain an occupational injury than those who had only recently started (Lemasters et al. 1998).

According to a recent study, a higher percentage of workers experienced job stress at some point, and there was a significant connection between working stress and MSD discomfort. According to Bongers et al. (1993), repetitive work and time pressures are linked to MSD symptoms. Age, gender, injury history, smoking, and psychological factors all significantly influence low back diseases at work, according to Salik (2004). According to other research, MSD development is influenced by psychological strains associated with the workplace and the job itself (fredriksson et al. 2001; Faucell 2005).

The most frequent areas of discomfort for ironing workers are their calves, while lower back pain, foot pain, thigh, shoulder pain, and neck pain also occur in the sewing, packing, ironing, and dying industries. Continuous, repetitive operations including cutting, assembling, pressing, and finishing are involved in sewing machines. These tasks are carried out while seated, with the upper back curved towards the sewing machine, and the head bowed. Long-term use of this poor posture at work raises the risk of work-related MSD among those individuals.

The majority of studies indicate that feelings of increased burden, monotonous work, limited job control, workplace unhappiness, and insufficient social support are risk factors for WMSD of the neck, shoulders region, despite the fact that the results of earlier studies are not totally consistent. We were able to validate some of these links through our research. There was a strong correlation between a higher of neck/shoulder disorders and emotions of low job satisfaction, higher levels of physical exertion, and higher physical isometric loads. The incidence of distal upper extremity problems was also substantially correlated with work unhappiness and increased physical activity.

4. Conclusion

It is concluded that MSD discomfort was moderately widespread among textile workers, with the lower back and hip being the most common sites. Among garment workers, an increased incidence of mild to moderate upper body musculoskeletal pain was linked to both organisational and personal characteristics at work. The severity of MSD pain was affected by a number of variables, including working hours and employment experience. It should pay close attention to some determining elements, such as working hours, posture, and job stress, which may aid in preventing and controlling the discomfort from MSDs. In an effort to limit and control MSDs, employers and occupational health service providers should both be well aware of its existence. Several control measures, such as written ergonomics programmes, written management controls, ergonomic design considerations, training, and education, should be implemented in regard to the results, should be put in place to improve ergonomics implementation in the workplace. Training and education, restructuring the workstation, introducing mechanical help and giving manual garment workers personal protective equipment (PPE) are all control measures that can be put into place at these garments factories. Other than that, altering the workstation can lower the risk of musculoskeletal problems. This can be achieved by incorporating changes in position or brief pauses into the task to avoid static work conditions, avoiding harsh or sharp edges where hands meet in cutting machines and planning the work system to prevent muscle stress are two important precautions.

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References

Ahmad, A., Javed, I., Abrar, U., Ahmad, A., Jaffri, N. R., & Hussain, A. (2021). Investigation of ergonomic working conditions of sewing and cutting machine operators of clothing industry. Industria Textila, 72(3), 309-314.

Ahmad, A., Javed, I., Abrar, U., Ahmad, A., Jaffri, N. R., & Hussain, A. (2021). Investigation of ergonomic working conditions of sewing and cutting machine operators of clothing industry. Industria Textila, 72(3), 309-314.

Bayzid, B., Kamrujjaman, M., Hossain, A., & Musa, A. M. (2019). Prevalence and determinant factors OF musculoskeletal pain among female ready made garment workers residing IN northern Dhaka City: a cross-sectional study. Prevalence, 3(2), 345-358.

Biadgo, G. H., Tsegay, G. S., Mohammednur, S. A., & Gebremeskel, B. F. (2021). Burden of neck pain and associated factors among sewing machine operators of garment factories in Mekelle City, northern part of Ethiopia, 2018, a cross-sectional study. Safety and Health at Work, 12(1), 51-56.

Blåder, S., Barck-Holst, U., Danielsson, S., Ferhm, E., Kalpamaa, M., Leijon, M., ... & Markhede, G. (1991). Neck and shoulder complaints among sewing-machine operators: a study concerning frequency, symptomatology and dysfunction. Applied ergonomics, 22(4), 251-257.

Chan, J., Janowitz, I., Lashuay, N., Stern, A., Fong, K., & Harrison, R. (2002). Preventing musculoskeletal disorders in garment workers: preliminary results regarding ergonomics risk factors and proposed interventions among sewing machine operators in the San Francisco Bay Area. Applied occupational and environmental hygiene, 17(4), 247-253.

Das, S., & Natarajan, S. (2022). A study on musculoskeletal disorders in garment industry. Tekstilna industrija, 70(2), 61-66.

Das, S., Krishna Moorthy, M., & Shanmugaraja, K. (2023). Analysis of Musculoskeletal Disorder Risk in Cotton Garment Industry Workers. Journal of Natural Fibers, 20(1), 2162182.

Dianat, I., Kord, M., Yahyazade, P., Karimi, M. A., & Stedmon, A. W. (2015). Association of individual and work-related risk factors with musculoskeletal symptoms among Iranian sewing machine operators. Applied ergonomics, 51, 180-188.

Haq, S. A., Shazzad, N., Ahmed, S., Al-Qadir, A. Z., & Shahin, A. (2017). AB1157 prevalence of musculoskeletal disorders among garment industry workers in Bangladesh.

Karhu O, Kansi P, Kuorinka I (1977) Correcting working postures in industry: A practical method for analysis. Appl Ergon 8, 199–201

Kebede Deyyas, W., & Tafese, A. (2014). Environmental and organizational factors associated with elbow/forearm and hand/wrist disorder among sewing machine operators of garment industry in Ethiopia. Journal of environmental and public health, 2014.

Kuorinka, I., Jonsson, B., Kilbom, A., Vinterberg, H., Biering-Sørensen, F., Andersson, G., & Jørgensen, K. (1987). Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. Applied ergonomics, 18(3), 233-237.

McAtamney, L., & Corlett, E. N. (1993). RULA: a survey method for the investigation of work-related upper limb disorders. Applied ergonomics, 24(2), 91-99.

McAtamney, L., & Corlett, E. N. (1993). RULA: a survey method for the investigation of work-related upper limb disorders. Applied ergonomics, 24(2), 91-99.

Mulyati, S. (2019, April). The relationship between work posture and musculoskeletal disorders (MSDs) in laundry workers in the area of Puskesmas Sukamerindu Bengkulu. In 1st International Conference on Inter-Professional Health Collaboration (ICIHC 2018) (pp. 171-174). Atlantis Press.

Padmini, D., & Venmathi, A. (2012). Unsafe work environment in garment industries, Tirupur, India. J Environ Res Dev, 7, 569-575.

Reynolds, J. L., Drury, C. G., & Broderick, R. L. (1994). A field methodology for the control of musculoskeletal injuries. Applied Ergonomics, 25(1), 3-16.

Sealetsa, O. J., & Thatcher, A. (2011). Ergonomics issues among sewing machine operators in the textile manufacturing industry in Botswana. Work, 38(3), 279-289.

Tafese, A., Nega, A., Kifle, M., & Kebede, W. (2014). Predictors of occupational exposure to neck and shoulder musculoskeletal disorders among sewing machine operators of garment industries in Ethiopia. Science Journal of Public Health, 2(6), 577-583.

Weisell, R. C. (2002). Body mass index as an indicator of obesity. Asia Pacific journal of clinical nutrition, 11, S681-S684.