

WORK RELATED MUSCULOSKELETAL DISORDERS AMONG WORKERS IN UNORGANIZED SECTOR

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Abstract: In the era of globalization, urbanization is increasing day by day leading to increase in the work force in several unorganized sectors, the work force engaged in this sector work very hard but still have to face several problems related to their work leading to detrimental impact on their physical and mental health. A large number of people are associated with different types of jobs in the informal or unorganized sectors in developing countries. The present study is a critical examination of the selected cases exist in the literature on the musculoskeletal disorders among the workers performing similar types of works in different industry, and answer the question whether types and level of musculoskeletal disorders among the workers engaged in these industries are same or not. The study conclude that type of musculoskeletal disorders are similar but levels are differed among the workers of different industries although the requirement of physical and mental labour to perform the jobs are the nearly same, though the industries are not same.

Keywords: Musculoskeletal disorders, Postural discomfort and unorganized sector.

I. BACKGROUND

The musculoskeletal morbidity influences the society in a large scale. Musculoskeletal symptoms will be a threat to workers' life, and should be determined closely for the well being of work participation, social attachments and their financial positions. These induce the worker to specific postures, movements, and force-exertions, constituting a certain level of internal physical load. A high internal physical load may cause short term and long-term musculoskeletal symptoms. The physical ergonomic postures of work majorly noted for the risk factors are prone to the musculoskeletal Disorders MSDs. These factors include the work and frequency of motion of different body parts, such like forceful exertions, non-neutral body postures, and vibration.

Musculoskeletal disorders'' include a wide range of inflammatory and degenerative conditions affecting the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels. Body regions most commonly involved are the low back, neck, shoulder, forearm, and hand, Tal disorders because more work absenteeism or disability than any other group of diseases. Back and lower limb disorders occur disproportionately among truck drivers, warehouse workers, airplane baggage handlers, construction trades, nurses, nursing aides and other patient-care workers, and operators of cranes and other large vehicles.

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unorganized sectors, the work force engaged in this sector work very hard but still have to face several problems related to their work leading to detrimental impact on their physical and mental health.

The term "informal sector" or "unorganized sector" referred to represent the workers who have to perform their work under the working conditions which do not offer any protection under the purview of labour laws. In India, workers of un-organized sectors have to face the challenges of different socio-economic problems like poor working and living conditions, low wages, illiteracy, insecurity, ill health and exploitation.(Gangopadhyay and Dev, 2014). The workers under unorganized sectors bearing similar type of characteristics' related to their work, like prolonged working hours, intercepted working pattern, least of compliances of laws regarding protection, lack of allowances, leading to capture by MSDs and physical and mental agony. Therefore, it is imperative to mitigate the onset of musculoskeletal disorders by implementing interventions conducive for specific work activity.

The term work related musculoskeletal disorders are used in reference to conditions also called cumulative trauma disorder, repetitive strain injury, or overuse syndromes. These conditions involving muscles, tendons, or nerves are generally manifested by pain, discomfort, or tingling in a body region. The term work related musculoskeletal disorders are due to multifactorial nature of these conditions. Back pain is one of the most common occupational health problems among large number of workers. It is believed that musculoskeletal disorders are caused by different factors. These factors may be categorised into two components mechanical factors and psychosocial factor. The heavy physical work, heavy or frequent manual operations, repeated rotation of the trunk, whole body vibration, and prolonged sitting, working with hands at or above shoulder level, flexion of the neck, static contractions, monotonous or repetitive work with arms, are the most prevailing factors which are responsible for the musculoskeletal disorder among the workers.

The study of the musculoskeletal disorders is an important issue as this industry provide job opportunity to the millions of the workers with and without consideration of their skills unskilled workers are the major part of this industry, here age, gender is not important to get a job, women's as well as the child is work although the child laborer is banned all around the world there are several strict regulation regarding the child labour prevails in India. **Singh, S. and Kiran, U.V. (2013),**

examined the postural discomfort in child labour involve in different unorganized sectors and concluded that Children who work in construction site, workshop and brick kilns have high risk of body discomfort, because they do work in sun light and do hard works like lifting heavy loads, risk of shock and they use hard material. Children working in brick kilns reported high pain in legs and thigh because they make brick in sitting position and in sunlight. Child labour a known evil has to be eradicated to protect the childhood of the children.

Unorganized sector offer opportunity to the women’s workers. (K. Devi. and U.V. Kiran (2013) Argue about the status of the women’s in the construction industry and explore the key factors related to the status of female worker in the industry Women work as unskilled labour and face several other difficulties in comparison to males. Sexual harassment, gender biasness, wage discrimination are the major factor due to which the working environment becomes difficult for them in the industry and women’s are remains at same level of skill even after working few number of years along with these Working women’s has to balance between the family and works. (K. Devi. and U.V. Kiran (2014) work-life balance is the term used to describe practices in achieving a balance between the stress of employees ' family and work life. The demands and pressures of work make difficult to stretch time for balancing work-life activities. he working conditions in the construction industry have been improved during the past decades and efforts have been made to reduce the amount of heavy lifting and carrying, but hard physical labour, static work, climatic influences, noise, and dust are still consider able burden for construction workers.

A. Case presentation -1

Work related Musculoskeletal Disorders among gold smiths industry

Gold ornament making industries are one of the widespread small-scale industries of India. These industries

belong to the unorganized sector of the state. A large number of goldsmiths are working there for prolonged period in cross leg posture at semi confined workstation. Ghosh, T. et al. (2010) through their work identified the Occupational Disorders of the Goldsmiths in India. By the uses of a detailed questionnaire discomfort feeling was studied by a modified Nordic questionnaire, considering the information about work nature, job stress and discomfort feeling. The existing workstations were assessed by the measurement of work areas. Analysis of body posture by rapid upper limb assessment (RULA) was done to evaluate the work stress during their job. One hundred and twenty male goldsmiths were randomly selected from the Advancer district of Karnataka for this purpose, and concluded that the activities of the goldsmiths were also highly repetitive. Moreover, the study revealed that most of the workers were affected by occupational disorders like pain at neck (80%), shoulder (20%), wrist (45%), and low back (75%) and also eye problem like irritation (30%) and burning sensation (70%). They also perform their job in hazardous postures. It was recorded that the workstations were poorly illuminated (19 Lux) with respect to precision work. Accidents like cut and burn occurred frequently due to the unsafe condition of the workstation.

Twisting, bending, and over-reaching are the resultant of poorly designed workstation. These actions force the spine into a non-neutral position that increases the overall discomfort and pain particularly at the lower back, neck, and shoulders, which indicate that the goldsmiths are/may be affected by work-related upper body MSDs. Moreover, they have to work for a prolonged period of time remaining in such a constrained and awkward postures, which further amplifies their discomfort feeling. The working environment also affects them to a great extent. Lack of proper illumination at work site exerts an additional adverse effect on the eyes. Thus this study indicates the appalling condition of the goldsmiths.

Table: Visual discomfort in the goldsmiths

Goldsmiths	Eye burning	Red eyes	Blurred vision	Headaches
	84 (70)	102 (85)	48 (40)	60 (52)

B. Case presentation -2

Work related Musculoskeletal Disorders among Sewing Machine Operators

Wang, P.C. et al. (2007) argues that Garment industry is another unorganized sector, showing in the modern work offering job opportunity to skilled and talented work force. The typical sewing workstation consists of a sewing table with a built-in electric sewing machine, a non-adjustable household chair, and cardboard boxes/cart to hold incoming fabrics and sewn products. 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 .They assess the contribution of work-organizational and personal factors to the prevalence of work related musculoskeletal disorders (WMSDs) among garment workers in Los Angeles, A cross-sectional study of self-reported musculoskeletal symptoms among 520 sewing

machine operators from 13 garment industry sewing shops has been done. They had collected detailed information on work-organizational factors, personal factors, and musculoskeletal symptoms through face-to-face interviews. Unconditional logistic regression models were adopted to assess the association between both work-organizational factors and personal factors and the prevalence of musculoskeletal pain. They concluded that moderate or severe musculoskeletal pain in the neck/shoulder region was 24% and for distal upper extremity it was 16%. Elevated prevalence of upper body pain was associated with age less than 30 years, female gender, Hispanic ethnicity, being single, having a diagnosis of a MSD or a systemic illness, working more than 10 years as a sewing machine operator, using a single sewing machine, work in large shops, higher work-rest ratios, high physical exertion, high physical isometric loads, high job demand, and low job satisfaction.

C. Case presentation -3

Work related Musculoskeletal Disorders among employees in a newspaper office

The association of upper extremity musculoskeletal disorders and work-related factors among employees using video display terminals at a large metropolitan newspaper was assessed. Their study includes 1050 randomly selected workers from four departments. Musculoskeletal disorders of the upper extremities were defined by frequency, duration, and intensity of symptoms not attributable to acute injury. Data was analyzed using logistic regression. The one-year period prevalence rate for any musculoskeletal disorder of the upper extremities was 41%. Neck symptoms (26%) were the most frequently reported, followed by hand or wrist (22%), shoulder (17%), and elbow (10%) symptoms. Greater time working at the video display station was associated with increased hand or wrist symptoms in a dose-response relationship. In addition, variables corresponding to increased work-load demands (eg, increased time working under deadline and increased job pressure) were associated with increased neck, shoulder, and hand or wrist disorders (Bernard, B. et al. (1994).

D. Case presentation -4

Work related Musculoskeletal Disorders among child workers in Brick kilns in Nepal

The musculoskeletal disorders among the workers in Brick kilns was studied. Brick manufacturing is a labor intensive informal industry using child workers as the major work force in Nepal. Workers are required to use physical strength, carry heavy loads and remain in a squatted posture for longer periods doing repetitive tasks posing threats to musculoskeletal system. This study involved cross sectional study of children aged 17 years and below. The study respondents included 101 cases and 64 controls in Bhaktapur and 97 cases and 43 controls in Sarlahi. Lack of adequate physical infrastructure, poor working conditions with non existent safety procedures have posed risk to physical, mental and overall well being of children. The study identifies work related physical ailments and discomforts dominate brick industries of Nepal. The musculoskeletal disorder related pain and discomfort was experienced by 73 per cent of working children in Bhaktapur and 58 per cent in Sarlahi. The odds ratio suggests that working children were eight times more likely to experience trouble or body pain compared to non-working children. This study finds that presence of inferior physical environment, working conditions and practices has contributed to musculoskeletal injuries and problems exposing working children to risks and hazards (Joshi, S.K. et al. (2013).

E. Case presentation -5

Work related Musculoskeletal Disorders among supermarket cashiers

Baron, S.L and Habes, D. (1992) has conducted their studies on approximately one million workers in the United States who are employed as supermarket cashiers. Over the past several years, these workers have been reported to develop work-related musculoskeletal disorders. The prevalence of

occupational musculoskeletal disorders among super- market cashiers in one supermarket chain and to make recommendations to improve the workstation design. A case of a work-related upper extremity musculoskeletal disorder was defined as a worker who complained of symptoms, during the past year, in the neck, shoulder, elbow, or hand and wrist. The symptoms should have occurred at least once a month or lasted at least one week, should have started after the worker was employed in his or her current job, and should not have been associated with an acute injury.

The prevalence of disorders was determined, and an unconditional multiple logistic regression analysis was used to compare the prevalence among cashiers to that of all other supermarket workers, while confounders, including age, hand-intensive hobbies, and systemic diseases, were controlled for. Since the cashiers were almost exclusively female (96 %), the statistical analysis was confined to female employees. The supermarket cashiers had a higher prevalence of cumulative trauma disorders than the other supermarket workers.

F. Case presentation -6

Work related Musculoskeletal Disorders among taxi drivers

Srivastava, S. and Kiran, U.V. (2014) has studied the Work related musculoskeletal disorder on various body segments in taxi drivers. Work-related musculoskeletal disorders affect almost all parts of the body especially the back, neck lower and upper limbs depending upon the physical movement characteristics, and the ergonomics and mechanical design of work task. 48.3 percent taxi drivers feel pain in shoulder right in the last 12 months and 42.5 percent drivers feel pain in the last 7 days. 9.2 percent taxi drivers feel pain in upper arm right in the last 12 months and 3.3 percent drivers feel pain in the last 7 days. In the last 12 months only 1.7 percent drivers felt work related trouble in forearm right but in last 7 days 42.5 percent drivers felt work related trouble in forearm left.

G. Case presentation -7

Work related Musculoskeletal Disorders among sanitation workers

Gangwar, P. and Kiran, U.V. (2014) has examined the postural discomfort among sanitation workers. These disorders mainly affect the back neck, shoulders and upper limbs, but can also affect the lower limbs. Some Musculoskeletal disorders such as carpal tunnel syndrome in the wrist are specific because of their well defined signs and symptoms.

The problems appeared in the neck, upper arms, mid back, upper back, buttocks. Frequent or some pain during the study was complained in the neck, upper arms, mid back, upper back, buttocks of the respondents. The number of complaints was lowest in the legs, thighs and lower back. Particularly, pain in the neck, shoulder, arms, buttocks and upper back region clearly increased with age. The cleaners themselves estimated that the repetitive work movements and continuous moving caused the greatest postural discomfort in their work.

The case studies clearly indicate prominent evidence of musculoskeletal disorders among various professions.

Table-1. Presents the requirement of skills among various professions and provision of safety measures.

Jobs	Level of Skills Required	Status of Safety Measurers
Gold smith	High	Low
Sewing Machine Operator	High	Low
Printing press	Moderate	High
Brick kilns	Low	Low
Super market cashiers	Moderate	High
Taxi Drivers	High	Moderate
Sanitation	Low	High

Table-2. Presents the intensity of pain across various body parts in accordance to the professions.

S. no	Body parts	Gold smith	Sewing Machine Operator	Printing press	Brick kilns	Super market cashiers	Taxi Drivers	Sanitation
1	Eyes	Severe	Severe	Moderate	Moderate	Moderate	Severe	Mild
2	Neck	Severe	Severe	Mild	Moderate	Moderate	Severe	Moderate
3	Shoulder	Moderate	Severe	Moderate	Moderate	Severe	Moderate	Severe
4	Upper back	Mild	Moderate	Mild	Moderate	Moderate	Moderate	Severe
5	Upper arms	Mild	Moderate	Mild	Moderate	Moderate	Mild	Moderate
6	Mid back	Moderate	Moderate	Mild	Mild	Mild	Mild	Moderate
7	Lower arms	Moderate	Moderate	Mild	Moderate	Mild	Moderate	Moderate
8	Lower back	Moderate	Mild	Moderate	Moderate	Moderate	Moderate	Moderate
9	Buttocks	Mild	Mild	Mild	Mild	Mild	Mild	Mild
10	Thighs	Mild	Mild	Mild	Mild	Moderate	Mild	Mild
11	Legs	Moderate	Moderate	Moderate	Moderate	Moderate	Mild	Moderate

From the above table it is clear that all the workers have to make similar type of posture due to which the common discomfort part is their backbone and other parts are according to the work performed as goldsmith and sewing machine operator suffering from pain in wrist and eye, where as printing press and brick kilns have problems in shoulders, the level of skills required represents the mental work, sewing machine operator, goldsmith have to use their skills (in different design, creativity) on the other hand there are no need of such skills in printing press and brick kilns. Safety measures are only high at printing work as there are uses of heavy machines in comparison to the others.

II. CONCLUSION

The ergonomics and safe practices have to be established to reduce work related vulnerabilities to increase over all wellbeing of workers. Although the concept of safety/ health and good ergonomics practices are introduced in all industries but these practices are always put at back of the workers life in unorganized sectors. The level of MSDs is also be high due to the unorganized structure as the workers have to work in the stressful, competitive, environment, in order to get jobs security and survival within the industries.

The workers engaged in different industries are performing different works, the instrument, inputs and outputs are also different but the body posture and the parts of body heavily used are approximately similar across all the works

due to this, the problems related to work are common in nature but the levels are different. The MSDS among the goldsmith workers and Brick kiln workers and supermarket is higher in comparison to the sewing operators and news papers industries. The problem of upper extremity which includes the problems of pain in neck, shoulders, wrist, elbow, back is 80,20,45,75% found to be is highest among the gold smith workers preceded by problem of upper extremity among the brick kilns workers is (73 %). The workers of sewing machine operators and news paper printers have less level of discomfort as only 16, 41 present. Work related musculoskeletal disorders are differing for different industries.

Provision of better work station design for the workers to enable them to work in proper posture is required to improve workers safety, comfort and efficiency. Musculoskeletal disorders hamper workers health as well the performance and ergonomically designed work stations and provision of safety measures plays a vital role in upgradation of quality of life of the workers.

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