

Work-Related Musculoskeletal Disorders among Hammering Workers

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ABSTRACT

Hammering workers are working in construction field to demolish buildings by using hand power tools. The purposes of this study were to examine the prevalence of work-related musculo-skeletal disorders (MSD) among the operators and to value the relationship between work-related musculoskeletal disorders and ergonomic risk factors. A questionnaire consisting four domains (psychological /personal /work-related/ergonomic risk factors) was delivered to workers who works in demolish hammering and data collection is done by face-to-face interview and observation method. Most of the hammering workers are affected by musculoskeletal disorders. Statistics Analysis exposed that some work-related ergonomic factors were highly related with symptoms on neck, wrist and shoulders. Long working hours, high mental depression at work and past injury history were major risk factors for work-related MSD. Further regulations, regarding health and workplace environment, as well as training to the operators for body mechanics, should be practiced to prevent Musculoskeletal Disorders.

KEY WORDS: Hand-Arm Vibration, Work-related Musculoskeletal Disorders, Hammering workers.

1. INTRODUCTION

Hand Arm Vibration (HAV) is the vibration transmitted from work processes into worker's hands and arms. This is due to prolonged operation of hand-held power tools such as road breakers and hand-guided equipment. Hand-Arm Vibration injury is a term which is used to indicate the affects in human hand arm and fingers caused by vibration. Continuous exposure to HAV may cause permanent injuries to hands and arms including damage to the Vascular, Neurological and Musculoskeletal systems of human body. Work Related MSD is one of the serious problem in working environment and resulted in productivity loses. WMSD mainly depends on working environment, workers and type of tasks. This work aims to identify the Musculoskeletal Disorders and its effects among hammering tool workers in western part of Tamil Nadu, India. The factors influencing HAVDs are high repetitiveness, awkward posture, age, prolonged standing, vibration and tool weight. Several studies inferred about HAVD and its risk factors among different working environments around the world. Yet there is no specific study is found to analyse the Hand Arm disorders among Hammering tool workers. Thus the hammering tool workers participated in the investigation has high prevalence of HAVD and Ergonomic risks.

2. METHODS & MATERIALS

Design: Data were gathered in a cross-sectional study design among demolishing hammer working in a west part of Tamil Nadu in India by means of a self-reporting questionnaire. Participation in any part of the study was voluntary and the voluntary time considered as working time. The workers are selected from companies, building contractors and construction workers.

Work and Workplace: This investigation was conducted among the Hammering tool workers from various districts in western part of Tamil Nadu, India. The daily work for Hammering tool workers is to demolish walls and dig floors ordered by the customers. This work is regular and workers don't have rest except Sunday. The workers would work for 8-10 hours. During the work period, the working method and work nature was evaluated, the risk factors were also observed.

Hammering tool work is one of the construction based work. Mostly, the work was not shared with co-workers. Three rest times were provided to the workers, two tea breaks and one lunch break. The working time is changeable based on work. Night time also work carried out some times.

Participants: A total of 321 Hammering tool workers with different age and experience groups were considered for the investigation. Only male gender is available in this field. The workers participated in the study were full time workers and all of them work more than 6 hours per day. The wages for the subjects were based on contract basis and permanent weekly wages. There is no higher increment depends on the experience. This work was performed throughout the year.

Data Collection: The information were collected by Modified Nordic Musculoskeletal Questionnaire and direct observations. The first sections of the questionnaire were related to workers background such as age, gender, work experience, and personal habits such as smoking and alcohol consuming were discussed. In the second section Questionnaire consists of Psychological factors such as willingness in job, personal satisfaction in job, comfortableness and stressfulness. In medical section chronic diseases, respiratory problems, sick leave, surgery and bone dislocation were discussed. In work-related information's rest time, working time, cloth distance, number of standing hours, awkward posture, weight of frame, and repetitive work were discussed. For analysing MSD symptoms each and individual sites such as neck, shoulder, elbow, wrist/hands, upper back, lower back were

analysed individually by asking questions. Example: “Have you ever suffered from neck pain for last 12 months? 1) Yes 2) No”. The frequency and severity for different anatomical sites were analysed by asking questions like, “How frequent you realize the pain in particular part?” with options as a) 1-2 times per year, b) 1-2 times per month, c) 1-2 times per week, d) Everyday, were displayed. The workers were supposed to reply anyone of the option for that question. If the workers reported there is no pain in any site, for that particular site the frequency was skipped. The severity of the pain in anatomical sites were analysed by, “Rate the severity of pain”, for which the options disclosed as a) mild pain/ b) moderate pain without decline in activity, c) severe pain with decline in activity, d) intolerable pain requiring time off work for severity rating. Finally, the question discussed about how far the pain affecting the work efficiency.

Data Analysis: Statistical analysis was performed using Statistical Package for Social Sciences SPSS (v20.0). SPSS is a powerful, user-friendly software package for the operation and statistical analysis of data. This software is widely for the researchers in the areas of psychology, sociology, psychiatry, and other behavioural sciences. It does an extensive range of both univariate and multivariate procedures which is used in the above mentioned studies. The “Statistical Package for the Social Sciences” (SPSS) is a package of programs for manipulating, analysing, and representing data. Descriptive statistics were performed to determine mean, frequency, standard deviation of the variables. Under the descriptive statistics Chi-Square test were used to find the association between MSDs and various risk factors.

3. RESULTS

Basic characteristics of participants: The basic characteristics and personal details are given in the below table among 321 hammering workers.

Table.1. Basic characteristics of 321 participants

Factors	Catogery	No. Of Respondence (321)	Percentage (100%)
Age	< 20	10	3.1
	21-25	86	26.8
	25-30	75	23.4
	30-40	109	34.0
	>40	41	12.8
Height	< 5'	9	2.8
	5'-5.4'	43	13.4
	5.4'-5.8'	115	35.8
	5.8'-6'	133	41.4
	>6'	21	6.5
Weight	51-60kg	18	5.6
	60-70kg	120	37.4
	70-80kg	155	48.3
	>80kg	28	8.7
Hammer Experience	<1years	8	2.5
	1-3years	2	.6
	3-7years	86	26.8
	7-10years	157	48.9
	>10years	68	21.2
Educational Qualification	illiterate	46	14.3
	elementary	112	34.9
	high school	136	42.4
	ITI/Diploma	21	6.5
	degree	6	1.9
Playing/ Exercise	never	237	73.8
	rarely	26	8.1
	sometimes	27	8.4
	often	12	3.7
	regularly	19	5.9
Smoking	yes	153	47.7
	no	168	52.3

Musculoskeletal Disorder: The MSD pain level details are given in the below table among 321 hammering workers.

Table.2. Pain levels of 321 participants

Factors	Category	No. Of Response (321)	Percentage (100%)
Shoulder pain	No pain	36	11.2
	Low pain	102	31.8
	Moderate pain	18	5.6
	Pain	165	51.4
Elbow pain	No pain	65	20.2
	Low pain	100	31.2
	Moderate pain	113	35.2
	Pain	43	13.4
Wrist pain	No pain	74	23.1
	Low pain	88	27.4
	Moderate pain	115	35.8
	Pain	44	13.7

Age, experience, physical demands, work place, repetitiveness, job satisfaction and work-life balance all significantly and independently contributed to the final model and explained approximately one quarter of the variance in discomfort score. The size and direction of the results suggest that increasing age, experience, high physical demands, low job satisfaction and low levels of work-life balance were significantly associated with increased levels of discomfort and MSD.

DISCUSSION

Aim of this study was to inspect key predictors of MSD risk in Hammering sector employees. Employees who were older and experienced high levels of physical and psychosocial hazards reported higher levels of discomfort than their counter parts. In addition, those with low levels of job satisfaction and poor work life balance were more likely to report relatively high levels of discomfort. The relationship between high discomfort and low satisfaction in job is an important finding and provides support for the direction and structure of future risk management of MSD.

4. CONCLUSION

Present results indicate that hammering workers are exposing to MSD risks mostly on the neck, wrist/hand and shoulder. The work task and psycho-social factors were identified as the main cause of MSD among the workers. Therefore, an ergonomics development on the job design, proper tool maintenance and proper training are needed in order to decrease the MSD risks. The results of this study also provide reference to hammering workers regarding safe handling of tools, ergonomics and health awareness.

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