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Occupational Therapy

"TO FIND THE PREVALENCE OF WORK-RELATED MUSCULOSKELETAL DISORDERS AND STUDY THE EFFECT OF OCCUPATIONAL THERAPY INTERVENTION ON QUALITY OF LIFE AMONG HEAVY DUTY RAILWAY WORKERS"

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ABSTRACT Musculoskeletal Disorder (MSD) is one of the leading causes of occupational injury among factory workers. MSDs are caused due to poor working conditions and the absence of an effective work injury prevention program. To prevent musculoskeletal disorders, a balance between mechanical load at work and load-bearing capacity of the musculoskeletal system is most important.

In this study, WERA (Workplace Ergonomic Risk Assessment) tool was used to evaluate work environment for the physical risk factors. Mechanical overload, high repetition frequency, long duration of force execution, exposure time, uninterrupted muscle force execution, unfavourable posture are the common risk factors of musculoskeletal disorders. That affects quality of life of the workers, leading to a deterioration of work productivity.

The primary aim of the study was to develop the capacity of the working persons to the work by training and adapting working conditions. Thus, on-site occupational therapy intervention has shown a positive effect on decreasing work-related musculoskeletal disorders and improving quality of life.

KEYWORDS : CMDQ, MSD, QOL, Railway worker, REBA, WERA

INTRODUCTION

Musculoskeletal disorders (MSDs) are injuries and disorders that affect the human body's movement or musculoskeletal system [1] Work related musculoskeletal disorders (WMSDs) are a group of painful disorders of muscles, tendons, and nerves. MSDs are one of the major causes of morbidity and the second most common cause of disability worldwide. [2] In India, epidemiological studies indicate the community-based prevalence of about 20% and occupation-specific prevalence found to be as high as 90% in various studies. [3]

MSDs are caused due to poor working conditions and the absence of an effective work injury prevention program. [4] Risk factors of Musculoskeletal disorders are known to include workplace activities such as heavy load lifting, repetitive tasks and awkward working postures [5] Musculoskeletal disorders are associated with high costs to employers such as absenteeism, lost productivity, and increased health care, disability, and worker's compensation costs. Due to lack of awareness about proper body mechanics during work, workers are exposed to work related physical risk factors which lead to work related musculoskeletal disorders. [6]

The current study has been conducted to find out the prevalence of WMSDs among heavy duty railway workers and to reduce musculoskeletal discomfort and improve quality of life.

MATERIALS AND METHODS

Design of study:

Prospective, Interventional study was conducted for the period of . The study protocol was approved by the Institutional Ethics Committee along with written permission from Indian railway authority. Inclusion criteria were, subjects in the age group 20-54years with muscular discomfort >1.5 on Cornell musculoskeletal discomfort Questionnaire (CMDQ) and workplace scoring 28-44 on Workplace Ergonomic Risk Assessment (WERA). Workers having neuropsychiatric illness or other musculoskeletal disorders were excluded.

Cornell musculoskeletal discomfort Questionnaire (CMDQ) [7]

CMDQ is a well-designed data collection tool which was developed by Professor Alan Hedge and ergonomics graduate students at Cornell University This questionnaire is a screening tool and not a diagnostic instrument. The validity of the CMDQ has been tested by Dr. Alan in English with good results.

Workplace Ergonomic Risk Assessment (WERA) [8]

WERA is an observational tool was developed by Rahman et,al. This tool covers the six physical risk factors including posture, repetition, forceful, vibration, contact stress and task duration and it involves the five main body regions (shoulder, wrist, back, neck and leg). The reliability and validity studies on the WERA tool were shown to have good psychometric qualities and to be reliable when assessing the exposure of risk factors of the WMSDs in industrial settings and epidemiological studies.

PROCEDURE

Workplace was observed and screened using WERA for physical risk factors related to work. Two hundred workers were screened on CMDQ. Out of which one hundred worker met the inclusion criteria. From these forty-two completed assessment and remaining were dropout as they did not follow up. Subjects were enrolled in the study after signing of the consent form. Selected workers given occupational therapy intervention (60 minutes per session), 3 times a week for 8 weeks. Along with exercise therapy, body mechanics were also advised to the worker. Pre- and post-assessments were done by the researchers at the baseline and after eight weeks respectively.

Outcome Measures

Rapid Entire Body Assessment (REBA) [9]

REBA is widely used observational ergonomic assessment tools in various industries, developed by Dr. Sue Hignett et.al. It gives a quick and systematic assessment of the complete body postural risks to a worker. The analysis can be conducted pre and post intervention to demonstrate that the intervention has worked to lower the risk of injury.

World Health Organization Quality of Life– BREF (WHOQOL-BREF) [10]

It is used to assess the perception of QoL in each particular domain. It consists of four domains (physical, psychological, social, and environmental). It contains a total of 26 questions. The higher scores denote higher QoL

Table 1: Occupational Therapy Intervention [11]

Exercises	Exercise Instruction
Warm ups	Active full range of motion exercises of all joints of bilateral upper extremities and lower extremities.
Aerobic exercises	Spot marching, spot jogging.
Flexibility Exercises	To increase ROM of all joints. Low-intensity and prolonged self-stretching exercises of all joints of bilateral upper extremities and lower extremities.

Resistive exercises	To improve muscle performance and functional control. Resistive exercises for upper and lower extremities using Thera band. Quadriceps strengthening exercises
Recovery	Deep breathing exercises, Jacobson's progressive muscular relaxation.

RESULTS AND TABLES

DATA ANALYSIS

The data was entered using MS-Excel-2007 and analysed using SPSS-16 software. The P value less than 0.05 was taken as statistically significant.

Table 2: Demography Of Workers Selected

N =42	Mean	Std.Deviation
Age	48.55	8.315

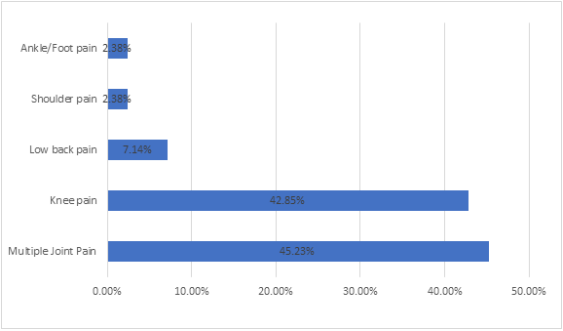

Fig.1: Prevalence Of Musculoskeletal Disorders

Table 3: REBA score pre and post intervention

	Mean	STD Deviation	P value	Significance
REBA Pre	8.45	.633	< 0.001	Significant
REBA Post	4.12	.453		

Table 4: WHO QOL BREAF score pre and post intervention

WHO QOL BREAF Domain		Mean	Std.Deviation	P Value	Significance
Physical Health	Pre	56.57	2.080	**0.044**	**Significant**
	Post	56.00	.000		
Psychological	Pre	59.12	4.026	**<0.001**	**Significant**
	Post	75.00	.000		
Social Relationship	Pre	64.00	7.708	**<0.001**	**Significant**
	Post	81.00	.000		
Environment	Pre	63.10	2.239	0.784	**Not Significant**
	Post	63.00	.000		

DISCUSSION

As per Table 2, the subjects involved in this study were all men (100%) with the mean age was 48.55. This could be due to the workshop selected for the study was heavy duty section in which only men were appointed as workers.

We found a high frequency of MSDs among the manual workers in railway workshop. Approximately, 95% reported experiencing MSD symptoms in any body part. Knee joint was most common, followed by pain in the neck, shoulder, back and ankle. (Fig.1). This high frequency of MSDs can be attributed to regular lifting of heavy loads. maintaining awkward postures for longer periods, repetitive movements of trunk and upper extremity, loading and unloading heavy objects etc. The National institute of occupational Safety and Health (NIOSH), in a review of work related to MSD, s found that the musculoskeletal disorders are more common in workers. [12] .Krishnendu Sarkar and Samrat Dev et.al (2016) conducted study to investigate the posture adopted during heavy load handling and the frequency of MSD in manual workers in Calcutta, found high percentage of workers reported pain in at least one body part and maximum work postures require immediate corrective measures for worker safety, including ergonomic and occupational training Intervention. [13].

On REBA analysis (Table.3) revealed that 83% of the workers were working at high risk level (8.45± 0.633) pre intervention whereas the REBA score changed to (4.12± .453) post intervention. Teaching body mechanics to the workers has shown the positive effect on using correct posture so, reducing the complains of joint pain. Thus, high prevalence of MSDs, and levels of risk, prioritize the necessity of corrective actions. A systematic review conducted by (2014) on effect of exercises on MSDs, concluded that stretching and strengthening exercises performed at workplace,3 times a week for 20 minutes could reduce musculoskeletal pain in multiple joints. [14]. Another study conducted (2018) by D.Kelly etal , evaluated the effectiveness of exercise therapy for Work Related Upper Limb Disorders (WRULD) in sedentary workers which showed positive evidence to support the use of exercise therapy in management of WRULDs [15]

The results of the present study revealed that the mean of environment domain was the lowest among four domains of WHO-QOL. This could be due to railway workshop is ISO 9001-2000 certified by Bureau of Indian Standard (BIS). It is a national standard body of India, engaged in preparation and implementation of the standards and certifications of the companies [16]. Whereas, significant improvement was seen in social and psychological domain as compare to physical domain of QOL (Table 4). The reason could be; the occupational therapy intervention was conducted at work place in group for the railway workers without disturbing their routine. This was found more helpful as they could share their health-related issues with each other, which was not otherwise happening before. The current findings can be based on the study conducted by D Van Eerd et al. (2016) who in their study concluded that supervised group-based exercise performed at work with motivational coaching sessions is more effective than exercising alone at home [17]. The limitations of the study are the workers from only one railway workshop were included and all of the participants were men; therefore, the present sample may not be representative of all railway workers.

CONCLUSION

It can be concluded that workers from railway workshop are exposed to high risk level, hence there was high prevalence of MSDs. Occupational therapy intervention and correct body mechanics has helped to reduce pain significantly with improvement in physical, social and psychological domain of QOL Thus improved functional ability and well-being of the workers.

REFERENCES

1. https://ccohs.ca/oshanswers/disease
2. https://en.wikipedia.org/wiki/Repetitive_strain_injury.
3. Dr. Sandul Yasobant, Dr. Satyajit Mohanti (2018); Musculoskeletal disorders as a public health concern in India: A call for action; The Journal of Indian Association of Physiotherapists: 12 (1): 46-47.
4. Work related musculoskeletal Disorders: A review of the evidence by Governing board of National Research Council, Washington, DC (1998); Pg 1-34.
5. Bernardino S. (2018); What's New in Association between Musculoskeletal Disorders and Quality of Life? Austin Journal of Musculoskeletal Disorders. ; 5(1): 1049-50.
6. Dr.rer.nat. Alwin Luttmann et.al (2003); Preventing Musculoskeletal Disorders in The Workplace by; Protecting Workers Health Series No.5: World health Organisation, pg.1-38.
7. Hedge A, Morimoto S, McCrobie D; (1999) Effects of keyboard tray geometry on upper body posture and comfort; Ergonomics; 42:1333-1349.
8. http://ergo.human.cornell.edu: Workplace Ergonomic Risk Assessment (WERA); User guide
9. http://ergo-plus.com : A Step-by-Step Guide Rapid Entire Body Assessment (REBA)
10. http://www.who.int/ mental health : WHO Quality of Life-BREF (WHOQOL-BREF) ; December, 1996.
11. Therapeutic exercise: foundations and techniques: Carolyn Kisner, Lynn Allen Colby; 6th ed. Chapter-16 -22 pg . 521-889.
12. https://en.wikipedia.org/wiki/National Institute for Occupational Safety and Health
13. Krishnendu Sarkar et al. (2016); Examination of postures and frequency of musculoskeletal disorders among manual workers in Calcutta, India.; Int J Occup Environ Health; 22(2): 151–158.
14. Isabel Moreira-Silva, et.al (2014); The Effect of a Physical Activity Program on Decreasing Physical Disability Indicated by Musculoskeletal Pain and Related Symptoms Among Workers: A Pilot Study; International journal of occupational safety and ergonomics; 20(1):55-64 ·
15. D Kelly, F. Shorthouse, et.al. (2018) : Exercise therapy and work-related musculoskeletal disorders in sedentary workers; Occupational Medicine ;68(4):262-272.
16. https://cr.indianrailways.gov.in
17. D Van Eerd et.al. (2016): Effectiveness of workplace interventions in the prevention of upper extremity musculoskeletal disorders and symptoms: an update of the evidence; Occup Environ Med ;73(1):62-70.