A Survey on Prevalence of Low Back Pain and its relation to Disability among Sewing Machine Workers in Punjab, India.

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ABSTRACT

Background: Low back pain is a problem in all developed countries. People with low back pain identified work place, financial and social pressures, and difficulties with household duties as areas of need beyond their healthcare requirements that affect their ability to comply with management of their condition. It is most commonly treated in primary health care settings. There are several factors which leads to the MSD related to work. The length of working hours strongly

associated with low back disorders among sewing machine operators. The commonest risk factors among sewing machine operators are adaptation of awkward posture.

Objective: Current study aims to find the prevalence of Low Back Pain and level of disability among sewing machine workers and to assess the relationship of Low Back Pain with disability among sewing machine workers.

Methods: The current study was correlational in nature. By simple random sampling 150 sewing machine workers were adopted. The data was collected, compiled and analyzed.

Outcome measures: Numerical Pain Rating Scale and Oswestry Disability Index.

Results: Mean was 3.78 and Standard deviation (SD) was 1.21. Pearson's correlation was 0.468. The relationship was statistically significant.

Conclusion: There was a significant positive correlation between pain and disability. There are several MSD which were related to the sewing machine operators. Because of long working hours, long duration of sitting with altered posture and continuous work lead to disorders. Moreover, there are age and gender factors which are directly related to the MSD.

Musculoskeletal disorders (MSD), Low back pain (LBP), Oswestry Disability Index (ODI), Numerical pain rating scale (NPRS).

INTRODUCTION

In all industrialised nations, although most people appear to recover quickly from an episode of LBA, disability resulting from back pain is more common than any other cause of activity limitation in adults aged less than 45 years and second only to arthritis in people aged 45 to 65 years. Back pain is one of the major health condition.[1] LBP is a chronic pain syndrome in the lower back region, lasting for at least 12 weeks, results in pain, muscle tension or stiffness which is localised below the costal margin and above the inferior gluteal fold, with or without leg pain (sciatica).[2,3] LBP is not attributable to a recognizable, known specific pathology like infection, tumor, osteoporosis, fracture, structural deformity, inflammatory disorder, radicular syndrome or cauda equine syndrome. [4] The job which involves monotonous and highly repetitive tasks performed in a sitting working posture alter the biomechanics of the spine over the sewing machine and have high occurrence of musculoskeletal complaints particularly the neck and

shoulder disorders because the work is visually demanding and requires a high degree of concentration and accuracy.[5] There are several factors which leads to the MSD related to work.

The prevalence of lower back musculoskeletal symptoms among operators engaged on the sewing machine in garment industry in Eastern Oromia Region, Ethiopia was high. While working in poor posture and monotonous repetitive movements, work involving prolonged hours of sitting and continuation of trauma or pressure on muscles, tendons, joints or bones in long run, due to repeated works without observing ergonomic principles were significantly associated with development of LBP. The length of working hour strongly associated with the prevalence of low back disorder among sewing machine operators moreover the prevalence of back pain increased as the number of working hours spent on repeated strenuous physical activities increased. [6,7] The occurrence of low back pain in India is also alarming with nearly 60% of the people in India have suffered from LBP at some time during their lifespan. In India, most of the low-income group people are engaged in physically demanding jobs which may increase the risk of low back pain and disability. [8,9] Musculoskeletal pain (MSP) is one of the most common occupational health risks among sewing machine operators or garment making workers, which affects social functioning and mental health and diminishes the quality of life. Physical and psychosocial load, poor climatic conditions, and vibrations have also been reported to be responsible for increased MSP among sewing machine operators in the textile industry. [10] Nonspecific LBA has become major public health problem worldwide. The lifetime prevalence of LBA is reported to be as high as 84% and the prevalence of chronic LBA is about 23%, with 11-12% of the population being disabled by LBA. [11] Pain intensity attenuates muscular activity, proprioception and tactile acuity with consequent changes of joint kinematics people suffering from LBA frequently show movement control impairments of the lumbar spine in sagittal plane. [12]

As Low back pain is the major cause of discomfort and disabilities in working population. The most prominent example of them is different kinds of low back pain, which is almost a common disease with around 80% all people get inflicted with it at least once during their lifetime. It has

been recognized as the most common cause of pain and chronic disability. Sewing machine workers have considerable occupational musculoskeletal stress. This study will help to find out the risk factors associated with low back pain and its relation to disability among sewing machine workers. Also it will set physiotherapy goals and treatment protocol. This study will make aware the sewing machine workers to eliminate the risk factors related to their poor working postures, causes the musculoskeletal pain. Moreover, this will set the scope and increases the area for physiotherapy in the working field.

MATERIAL AND METHODS

The current study was correlational in nature. The sample for the study was selected by simple random technique. Data was taken from sewing machine workers in Punjab, India. Based on inclusion and exclusion criteria 150 sewing machine workers were selected. The subjects with the age group of 30-50 years, both males and females sewing machine workers, working for at least 6-7 hours/day were taken as samples. The subjects who were Non co-operative, had any neurological conditions, Musculoskeletal disorders other than LBP, had recent trauma and cardiovascular patients were excluded from the study.

PROCEDURE

Informed consent were collected initially. The interview was conducted at the work place of the subjects to check the prevalence of pain among them and purpose of an interview was explained to each subject. Each participant was interviewed confidentially in Hindi and Punjabi language. Severity of the pain was assessed using Numerical Pain rating Scale. Modified Oswestry Low Back Pain Disability Questionnaire was used to measure the disability level among sewing machine workers with low back pain. The data was collected, compiled and analyzed.

Numerical Pain Rating Scale: Researches have found that the Numerical Pain Rating Scale (NPRS) is one of the most commonly used valid and reliable tool measures for pain level in

individuals. NPRS revealed higher discriminatory capability than VRS. NPRS also showed higher reproducibility when measuring pain exacerbations Cohen's K is 0.86. [13]

Oswestry Disability Index: Researchers have found that the Oswestry Disability Index (ODI) is one of the most commonly used valid and reliable tool measures for individuals with low back pain which shows good construct validity, test-retest reliability and responsiveness have been shown to be high. Cronbach α ranges from .71 to .87.2, Test- retest reliability has been shown to be high. Values range from r = 0.83 to 0.99. [14]

RESULTS

Data was meaningfully assorted through calculation Mean and Standard Deviation and Pearson's correlation was applied to find out the correlation between Numerical Pain rating Scale and Modified Oswestry Disability Questionnaire.

As shown in Table No. 5.1 and Graph no. 5.1 denoted criteria measure of VAS score in which % age for severe category (7-10) was 1%, for moderate category (4-6) it was 57% and for mild category (0-3) was 42%.

Table no. 5.2 and Graph no.5.2 shows the Descriptive statistics in which mean of VAS score is 3.78, Standard deviation (SD) is 1.21 and Median is 4.00.

Table No.5.3 and Graph no. 5.3 denoted criteria measure of Disability score % in which percentage for severe category (67-100) was 7%, for moderate category (34-66) was 77%, and for mild category (0-33) was 16%.

Table No. 5.4 and Graph no. 5.4 showing the Pearson correlation between Pain and Disability that is significant.

Table No. 5.1: Table Showing Level of Scores

CRITERIA MEASURE OF VAS SCORE		
Category Score	Percentage	Frequency
Severe(7-10)	1%	1
Moderate(4-6)	57%	57
Mild(0-3)	42%	42

Maximum Score=10
Minimum Score=0

Table no. 5.2: Descriptive Statistics table

Descriptive Statistics	Mean	SD	Median
VAS Score	3.78	1.21	4.00

Maximum= 10 Minimum= 0

Table No. 5.3: Table Showing Level of Scores

CRITERIA MEASURE OF DISABILITY SCORE %		
Category Score	Percentage	Frequency
Severe(67-100)	7%	7
Moderate(34-66)	77%	77
Mild(0-33)	16%	16

Maximum Score=100
Minimum Score=0

Table No. 5.4: Correlation between both Tools

Pearson's Correlation	Pair1	
	VAS Score	DISABILITY SCORE % Score
Mean	3.78	45.74
SD	1.211	12.295
N	100	
Correlation	0.468	
Table Value	0.197	
P Value	0.000	
Result	Significant	

Graph no.5.1: Diagram showing Level of Scores

Figure No. 5.2: Diagram Showing Mean and SD Score
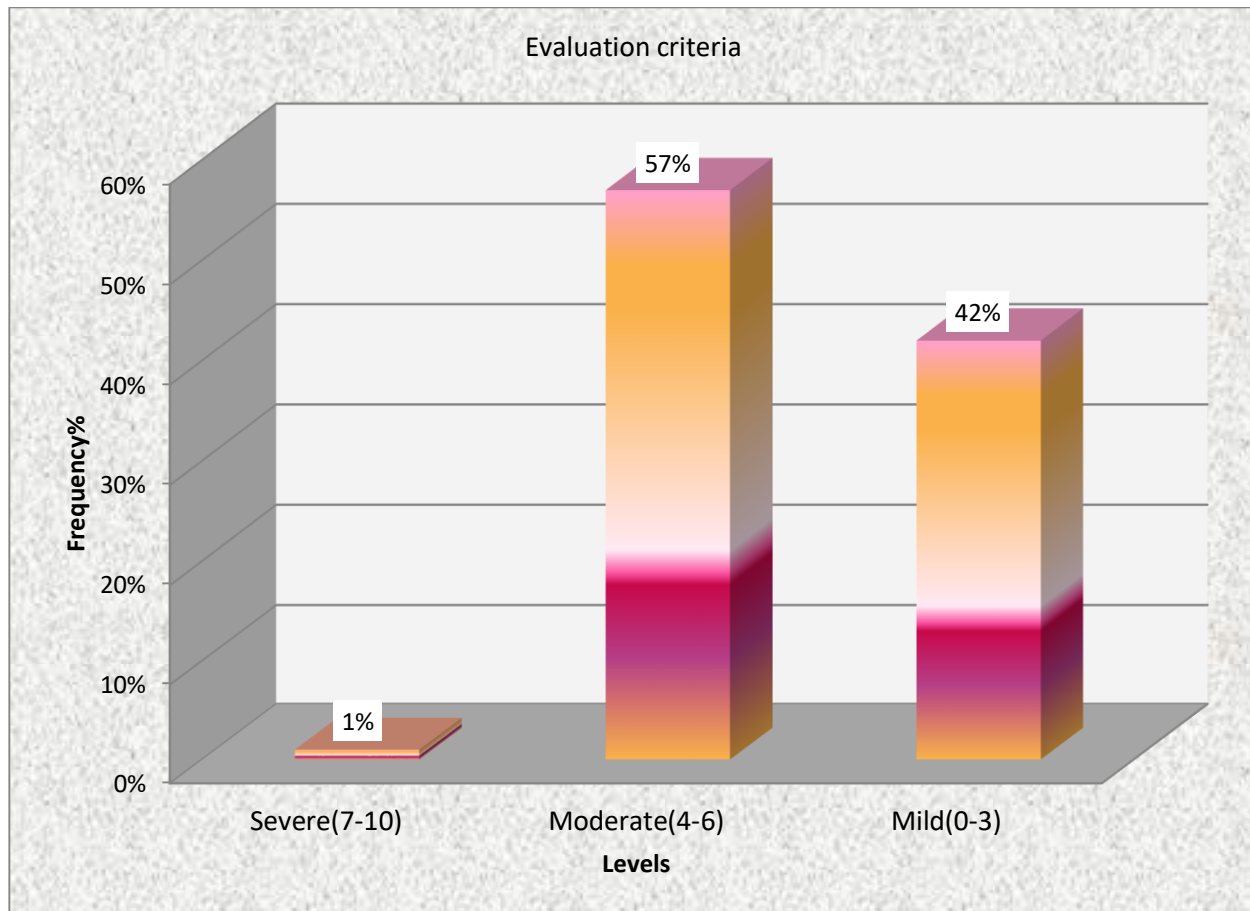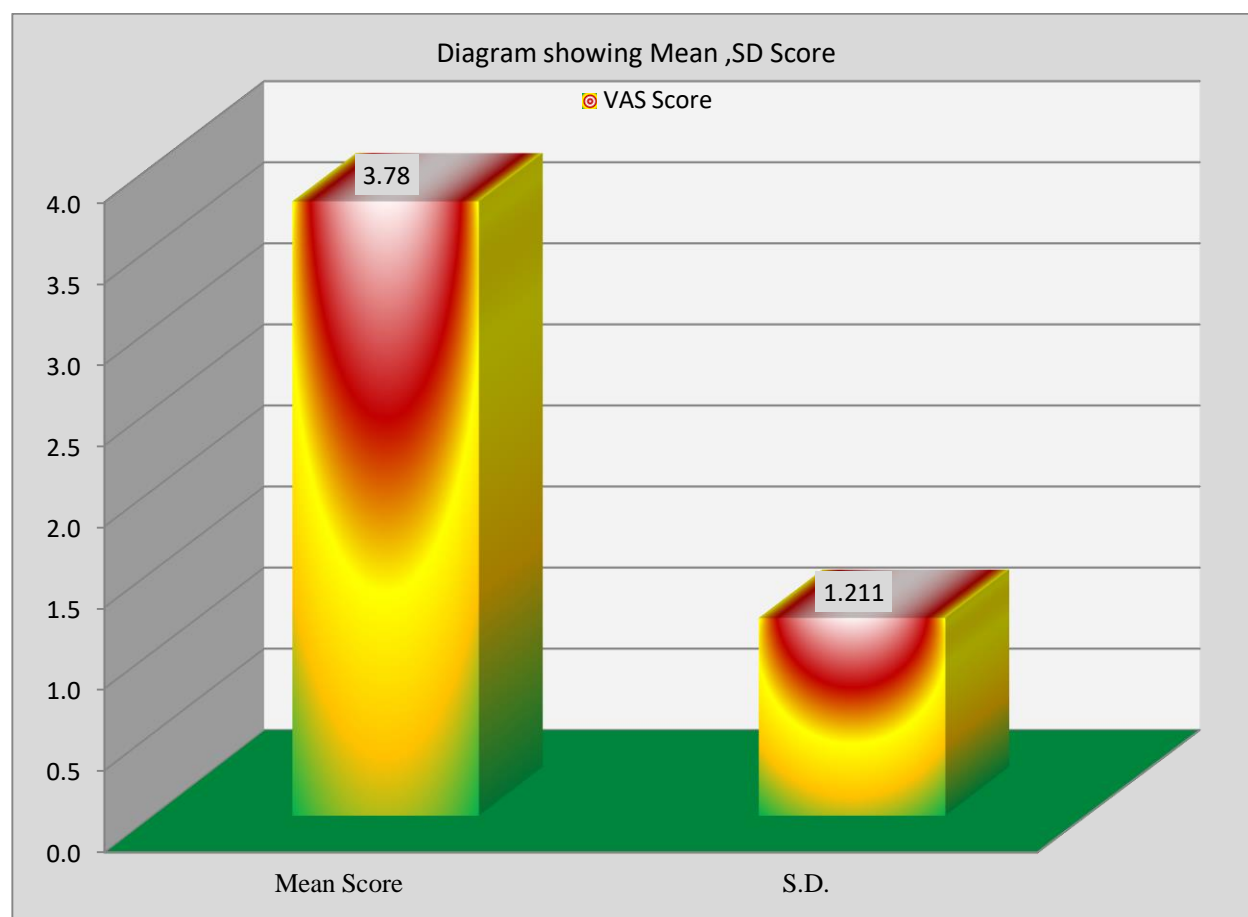

Diagram showing Mean ,SD Score

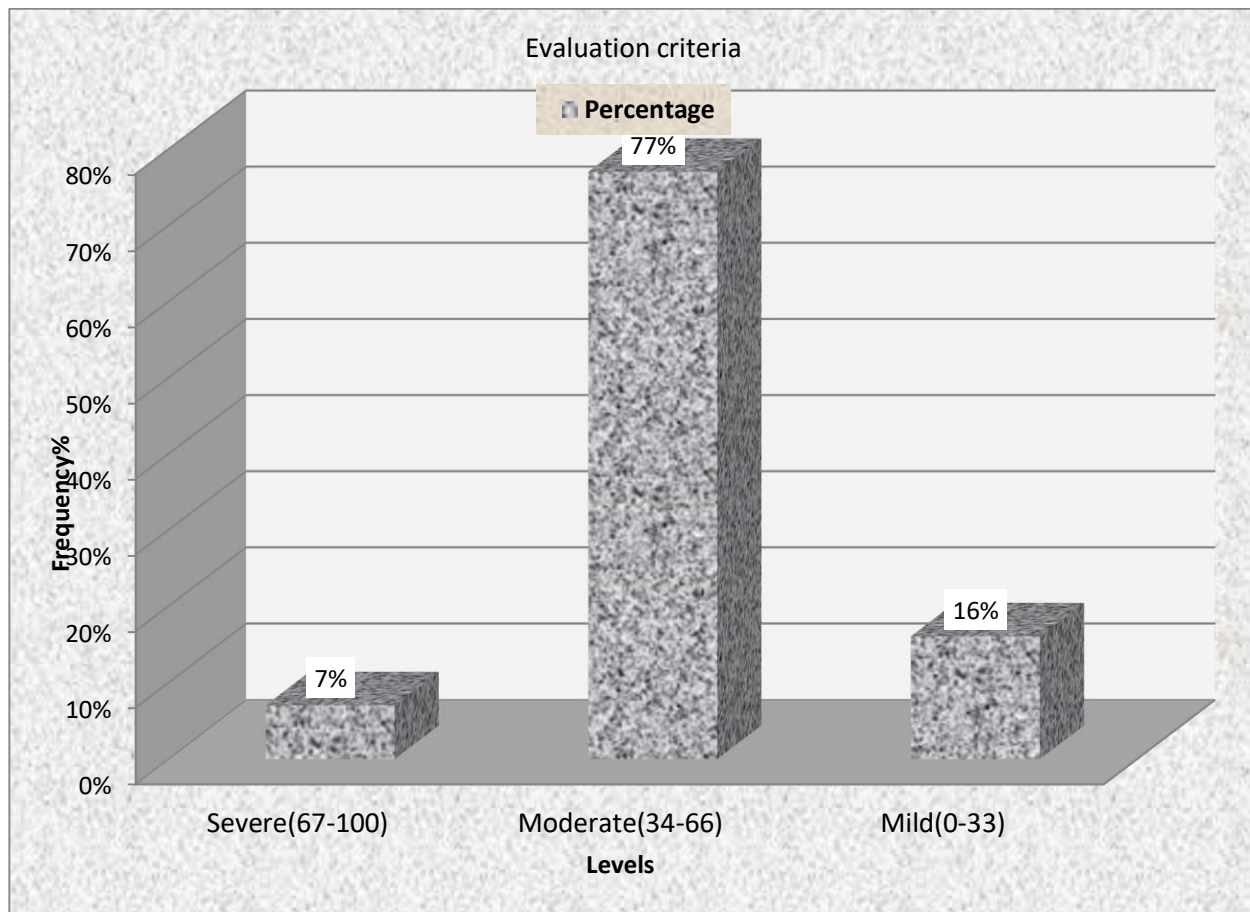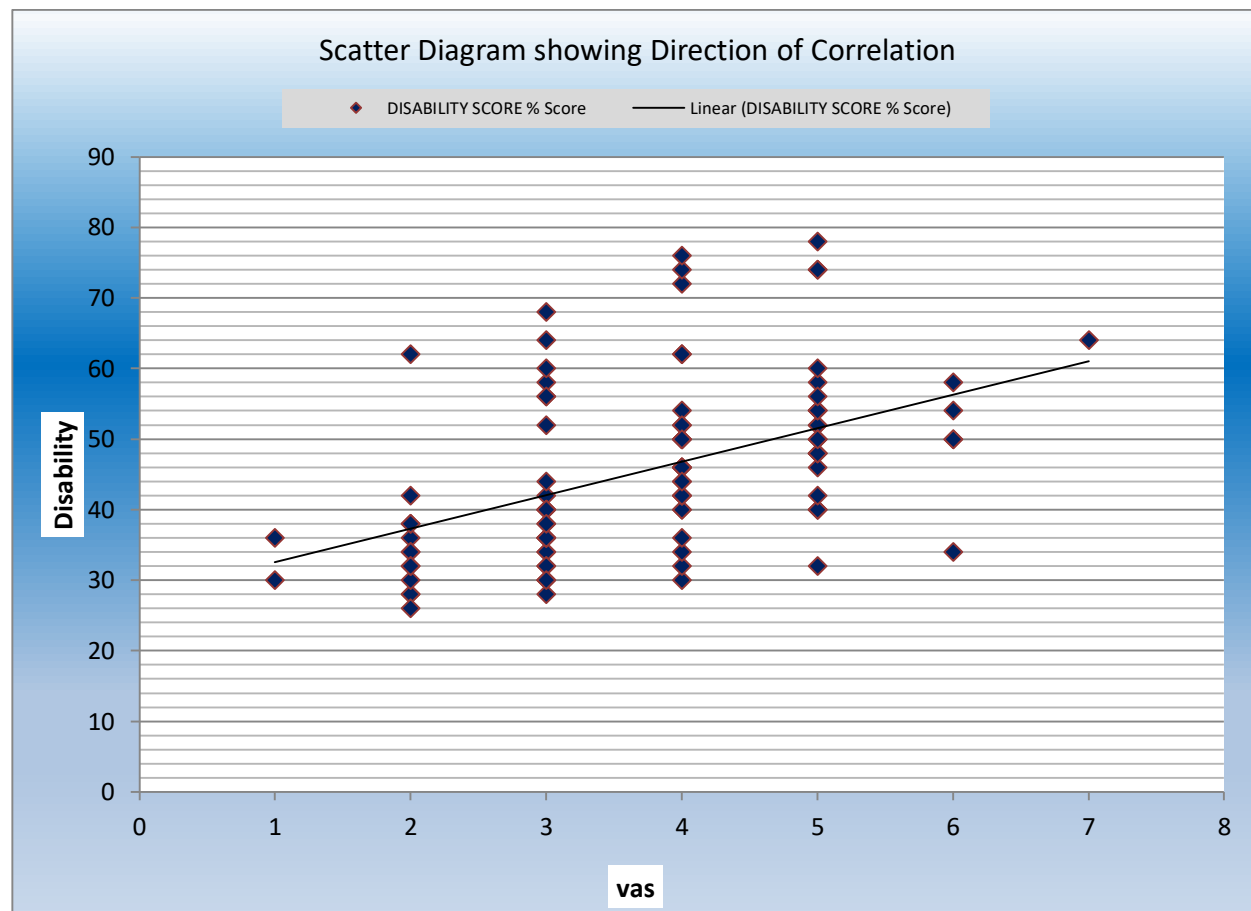Figure No. 5.3: Diagram showing Level of Scores

Figure No. 5.7: Correlation Between both Tools

DISCUSSION

Descriptive analysis and pearson correlation method is applied to find out the Low Back Pain and its relation to Disability among sewing machine workers in Ludhiana, Punjab, which was significant positive correlation. The 150 subjects participated in the study out of 150 subjects, the prevalence of pain was seen among 100 subjects, which was much higher when compared to other studies. Out of 100 subjects, 43% were females and 57% were males. Subjects with low back pain experienced moderate disability (77%, 77/100) followed by mild disability (16%, 16/100), and severe disability (7%, 7/100). The main cause for occurrence of low back pain is very low muscular activity during seated posture, presumably due to the flexion–relaxation phenomenon. Sustained stretch of passive lumbar structures in combination with essentially silent muscles may exacerbate low back pain in sedentary workers. [15] Prevalence of low back

pain among women was comparatively more than other studies in India. Although moderate disability was more among those with low back pain, overall Quality of life was good. [16]

Rural women suffer from multiple musculoskeletal problems that significantly impair their activities of daily living. In the home and farm where women performs tasks while sitting, standing, bending, twisting, awkward posture, duration of work and inadequate rest pause are associated with the occurrence of serious musculoskeletal problems and musculoskeletal disorders. Work related musculoskeletal problems and disorders affect all the parts of body. [17] Work-related musculoskeletal pain (MSP) was prevalent among Nigerian sewing machine operators, and low back is the most common site of pain. Many of them engaged in self-medication to alleviate their pain. There is the need for more enlightenment programs on ergonomics to possibly reduce the menace of MSP among this occupational group. [18] Regular breaks and less stress are required in the sewing industries. This will lead to less MSD in the workers. [19] The protective benefit of the stand-up work posture (SUWP) was statistically significant for spinal disorder (SD) incidence. Owing to high mean body mass index (BMI), SUWP had a negative impact on the incidence of lower limb disorders (LLDs) for the first 2 months. [20] MSD were seen more with increased work records and age in which, improvement of work postures, training for better execution of tasks and conducting periodic screening tests are being recommended. [21] Owners of sewing companies may be able to reduce or prevent WRMSDs among employees by adopting rotations between different types of workstations thus, increasing task variety; by either shortening work periods or increasing rest periods to reduce the work-rest ratio; and by improving the work organization to control psychosocial stressors. [22]

Sitting posture is an extreme orientation for the lumbar intervertebral disc that increases its internal pressure and anteroposterior shear flexibility and stresses the posterior region of the disc that may leads to Disability. [23] To overcome pain and disability among sedentary workers, ergonomics advice should be given to the workers as the chair of workers should be of adjustable height, backrest and comfortable seat that may reduce the intervertebral disc pressure and also

decreases the muscular activity of Shoulder, Neck and Back. [24] In case of sewing machine workers there should be enough space to settle down the apparatus conveniently, adjustable chair and cutting table. Subjects in seats with backrest inclinations of 110 to 130 degrees, with concomitant lumbar support, have the lowest disc pressures and lowest electromyography recordings from spinal muscles. [25]

CONCLUSION

There was a significant positive correlation between pain and disability. In which we saw that there are several MSD which are related to the sewing machine operator. Because of long working hours, long duration of sitting with altered posture and continuous work lead to disorders. Moreover, there are age and gender factors which are directly related to the MSD.

Limitations of the study:

The results of this study are limited because of the use of a self-reported questionnaire. Most of the subjects had a moderate disability, and there was an unequal number of males and females. The study is based on the small section of sewing machine workers. The intensity of the low back pain might have influenced by the recall bias of subjects.

Scope of Future Study:

Future studies may also investigate the impact of BMI, and duration of doing regular diary work on development of musculoskeletal disorders. Future studies should especially focus on the effect of health education and adherence to ergonomic measures and postures on prevalence of LBP and on development of disability.

Summary

The study was survey in nature. The current study aims to find out the Prevalence of Low Back Pain and its Relation to Disability among sewing machine workers in Ludhiana.

The sample for the study was selected by simple random technique. Based on inclusion and exclusion criteria 150 sewing machine workers were selected. Ethical consideration was taken. Severity of the pain was assessed using Numerical Pain rating Scale. Modified Oswestry Low Back Pain Disability Questionnaire was used to measure the disability level among sewing machine workers with low back pain.

The data was meaningfully assorted through descriptive analysis and pearson correlation method. There was a significant positive correlation between pain and disability.

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ABBREVIATIONS

MSD Musculoskeletal Disorder

MSP Musculoskeletal pain

LBP Low Back Pain

NPRS Numerical Pain Rating Scale

ODI Oswestry Disability Index

SUWP stand-up work posture

WRMSD Work Related Musculoskeletal Disorder