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PREVALENCE OF LOW BACK PAIN IN INDUSTRIAL WORKERS HAVING SEDENTARY WORK DEMANDS USING OSWESTRY DISABILITY INDEX

Occupational Therapy

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ABSTRACT

Background: Low Back Pain (LBP) has become a major public health problem among the working population resulting in disability, poor services and sickness absences at working places. Sitting has been associated with the risk of developing LBP. **Objectives:** To study the prevalence of LBP in industrial workers having sedentary work demands on Oswestry Disability Index (ODI). **Study Design:** Cross sectional, prospective and non-randomized study design. **Methods:** A total of 30 subjects (15 male, 15 female) between 20 - 60 years of age among industrial workers engaged in packaging of steel glasses were selected by a purposive sampling method. Workers were interviewed on ODI scale. Written consent from participants was taken.**Results:** Statistical calculations were done. The point prevalence of LBP in these industrial workers was 43.3% as minimum disability while 56.7% as moderate disability on ODI. **Conclusion:** This study shows prevalence of low back pain on ODI being mild to moderate in 30 industrial workers having sedentary work demands involving packaging of steel glasses.

KEYWORDS

Industrial workers, Low back pain, Sedentary work

INTRODUCTION

Low Back Pain (LBP) has become a major public health problem among the working population resulting in disability, poor services and sickness absences at working places. Sitting has been associated with the risk of developing LBP. The Global Burden of Disease (GBD) study estimated that LBP is among the top ten diseases and injuries that account for disability-adjusted life years worldwide (T Vos et al; 2012). A wide-range of factors such as lifting and carrying heavy objects, awkward posture, psychosocial job demands and job dissatisfaction, repetitive movement, static workload, bed making, not doing regular physical exercise, pulling and pushing heavy loads, bending and working with twisted trunks, and lack of rest have been identified as predictors of LBP (S Parmar, 2017; NC Gawde, 2018; H Zahid, 2017; L Zungu, 2015).

Rationale of the Study

Sedentary work and LBP. Many studies suggest that primarily, sedentary work increases the risk of low back pain. Intra-discal pressure is higher in sitting position than in standing or lying down. Sitting by itself does not imply a markedly increased association with the presence and/or occurrence of LBP but whole body vibration and/or awkward postures while sitting have been the important determinants of pain (AO Sanya et al; 2005). Hence sedentary job population was chosen on whom pain and other functional limitations due to back pain could be assessed.

AIMS AND OBJECTIVES

Aim: To study the prevalence of LBP in industrial workers having sedentary work demands.

Objectives: To study the severity of pain intensity, impact on various other parameters like personal care, lifting, walking, sitting, standing, sleeping, sex life, social life and travelling in these workers.

MATERIALS AND METHODOLGY

Study Setting: Conducted the study on industrial workers from steel factory, engaged in packaging of steel glasses, by using ODI.

Study Design: As it was intended to study the prevalence of LBP, cross sectional, prospective and non-randomized study design was adopted.
Study Sampling: A total of 30 subjects (15 male, 15 female) among industrial workers engaged in packaging of steel glasses were selected by a purposive sampling method after consideration of inclusion and exclusion criteria.

Inclusion Criteria:

1. Age between 20 to 60 years
2. Both male and female
3. 8 – 10 working hours/day; 6 days a week

Exclusive Criteria:

1. Age below 20 years and above 60 years
2. With any physical disability or accidental injury
3. History of pre-employment LBP

Workers were interviewed on ODI. This scale is considered the 'gold standard' of low back functional outcome tools (JC Fairbank et al; 2000). It consists of 10 questions on a 5-point rating scale assessing pain and functional status in performing activities of daily living involving back and lower limbs. Each section scores from 0 to 5, 0 indicates no problem while 5 indicates severe problem with a task and the total score is converted into percentage. 0% to 20% indicates minimum disability, 21% to 40% moderate, 41% to 60% severe, 61% to 80% crippled and 81% to 100% bed bound or exaggerating their symptoms.

RESULTS AND DATA ANALYSIS

Statistical calculations were done using SPSS software version 20 to find out the mean, T-value and P-value. All the 30 participants answered all the sections of the ODI. Among 30 participants, 15 were female and 15 were male workers with mean age 28.89 years. The point prevalence of LBP in these industrial workers was 43.3% which is minimum disability while 56.7% which is moderate disability on ODI (Figure 1).

Figure 1: Percentage distribution of data by severity of disability

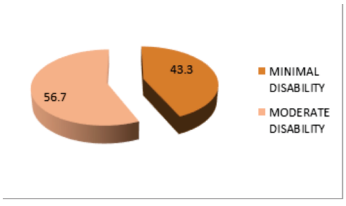

Figure 2 describes the components of the ODI questionnaire and the percentage of participants' responses. On the Y-axis from bottom to top are the components and their responses marked by the participants. All the participants fall under minimum to moderate disability. Therefore, starting from zero to maximum level the participants have answered on the scale from zero to five has been mentioned on the Y-axis for each component of the questionnaire. On the first component of the scale, Pain intensity, most of the participants (53.33%) marked "1" i.e. mild pain on the scale. 83.33% population marked "0" i.e. no pain interfering personal care. 40% population marked "0" i.e. no pain while lifting heavy weights however 33.3% population experienced "1" i.e. extra pain while lifting. Pain did not interfere walking component in 56.7% of the population since they marked "0" in that section. For sitting component, 46.7% population preferred comfortable chair over any chair since they marked "1" on the scale. 40% population complained extra pain while standing by marking "1"

on the scale while 33.3% had no problem in standing position with the response "0". 43.3% population had no problem in sleeping because of back pain hence marked "0" however 50% had occasionally disturbed sleep due to back pain i.e. "1" on the scale. 83.3% population had no pain interfering sex life since they marked "0" in that section. 50% population had no pain interfering social life with "0" response on the scale. 60% population marked "1" on travelling component thereby reflecting extra pain on travelling anywhere.

Figure 2: Percentage distribution of data by responses to the questionnaire

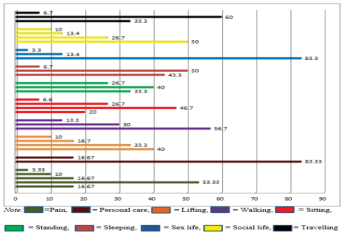

Table 1 shows application of "Paired t-test" to assess the level of significance for the variables of low back pain on ODI. Since, the P-value is less than 0.05, the data can be considered as statistically significant.

Table 1: T – test for variables of low back pain

Variables	T – value	df	P-value	Result
RAW SCORE (N = 30, Mean = 11.76667)	14.917	29	0.0003	Significant *

PREVALANCE OF LOW BACK PAIN IN INDUSTRIAL WORKERS Note: N= Number of participants; df= Degree of freedom; *T- test shows statistical difference, P value and significance ($p < 0.05$)

DISCUSSION

The present study is the documentation of the prevalence of LBP among industrial workers involved in packaging of steel glasses. This job demands the workers to stay in a static posture in sitting position and bending from trunk for long periods. In our study, out of 30 workers, 43.3% subjects fall under minimum disability while 56.7% under moderate disability.

For many years, sitting position has been identified as one of the major risk factors for developing LBP. Nachemson and Elfstrom (1975) found that body position affects the magnitude of the loads on the lumbar spine, and that the magnitude of the loads increases markedly when sitting is compared with upright standing and well-supported reclining.

In our study, participants reported no pain or mild pain i.e. 1 or 2 out of 5 on parameters like pain intensity, personal care, lifting, walking, sitting, standing, social life, sex life, sleeping and travelling on ODI. These findings are in support of Lee et al. (2013) work which concluded that the rate of LBP among occupations requiring extended periods of sitting may not be as high as the rate of LBP among more strenuous occupations but the former one had the highest hospitalization rate for LBP suggesting stronger intensity and severity of pain.

In contrast to our results of relationship between sitting and LBP, E Rafeemanesh et al. (2015) study suggested that the effects of general health-related factors such as weight, age, leisure time, physical activity and duration of employment are more important than occupational factors in developing LBP.

AO Sanya et al. (2005) in her study concluded that the job related tasks that predisposed the industrial workers to LBP included sitting and lifting activities while those of standing and vibration did not have any significant effect on the prevalence of LBP.

CONCLUSION

This study shows prevalence of LBP on ODI being mild to moderate in 30 industrial workers having sedentary work demands involving packaging of steel glasses. The present study is a wake up signal to take appropriate preventions and interventions strategies like ergonomic advice and ergonomic design to ensure a healthier working atmosphere and thereby improve productivity of the industrial workers.

LIMITATIONS

1. Small sample size
2. Wide age range from 20 to 60 years.
3. Study was done for point prevalence.
4. Study was assessed by only one assessment tool.

RECOMMENDATIONS

1. Study can be done on larger sample
2. Study can be done for different age groups
3. Study can be done with different work demands in the same industry
4. Interventional study can be done to check pre and post treatment results on the same scale.

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