Frequency of Work-related Low Back Pain and Disability Among Automobile Mechanics in Lahore

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Highlights:

- Frequency of work-related Low Back Pain (LBP) was 69.4% among automobile mechanics
- LBP caused severe disability to a lesser degree
- Oswestry Low Back Pain Disability Questionnaire was used to assess the disability caused by LBP

Abstract:

Background: Automobile mechanic work is an extensive and physically hard job. Consequently, the automobile workers suffer from ergonomic risk factors including Low Back Pain (LBP) as a major.

Objective:

To find out the prevalence of Low Back pain (LBP) and disability among automobile mechanics in Lahore.

Methodology:

The study was cross-sectional and included 180 auto-mechanics of Lahore. Oswestry Low Back Pain Disability Questionnaire (OLBPDQ) was used to measure the disability caused by pain. Pain was measured by Visual Analog Scale (VAS). Data was collected from 180 auto mechanics from auto repair shops of Lahore.

Results:

Out of 180 individuals, 125 subjects reported LBP with average age of 30±5.3 years. 87 individuals (69.6%) were minimally disabled and 31 individuals (24.8%) experienced moderate disability, whereas only 7 individuals (5.6%) experienced severe disability in activities of daily living (ADLs).

Conclusions:

LBP is highly frequent among automobile mechanics. Majority of the individuals suffering from LBP had minimal disability. The rate of moderate disability was also noticeable but number of individuals with severe disability was very low. Overall, LBP disturbed the quality of life.

Key Words:

LBP, Disability, Auto mechanics, Visual Analog Scale, Quality of life

Introduction:

LBP can be attributed as leading cause of absenteeism from work. According to a research it is estimated that number of days unrecalled due to LBP was 4.6% and individual lost 101.8 million days due to LBP .[1] Lumber spine has a unique construction which can be compared to a barrel shaped structure. The top of the barrel is made of deformable cartilage plate known as end plate which is 0.6 millimeter thick at the top but thinnest in the center.[2] The end plate is porous for transfer of nutrients, has load bearing ability and allows 6^0 between vertebras. Its capability to bear load depends on its shape and geometry. Collagen fibers orientation within the concentric rings of annulus is oblique to others. Annulus is able to resist loads when disc is twisted. Half of this mode of loading the other half becomes disabled resulting in substantial loss of ability to bear load. Annulus and nucleus both collaborate to hold up compressive load disc is subjected to bending and compression. Under compacting forces, the nucleus compresses applying

hydraulic forces to end plates vertically and inner annulus laterally. As a result annulus collages fibers protrude outward and become tensed.[3] The lumber spine movements are supervised by four major muscle groups divided into extensors, flexors, lateral rotators and rotators.[4]

LBP can be categorized as acute when the pain is experienced for less than 4 weeks, sub-acute when the pain ranges between 4–12 weeks. Any pain exceeding the duration of 12 weeks is called as chronic pain. Although classification based solely on timeframe is not satisfactory. Some researches classify LBP on the basis of beginning of indication, location, symptoms, extent, regularity and severity[5]. Grading system have been devised combing pain intensity and disability.[6] According to sources of pain it can be classified as mechanical with a known origin such as tumor or fracture or non- mechanical with a unknown cause.[7] Major cause of Work Related Low Back Pain (WRLBP) arises due to Awkward Posture (AP) of the auto-mechanics and poor egronomical settings of the workshops. AP is defined as deviation of the body from its natural position.n Postures attained mostly by the mechanics include kneeling, stooping, twisting and squatting. All these factors play a pivotal role in developing LBP. Another risk factor for LBP is increasing age.[9,10]

LBP can cause severe disability among individuals. LBP have decreased physical activity as compared to healthy individuals having same characteristics. The quality of life declines due to workspace environment and habits while performing work along with LBP in automobile mechanics. Auto mechanics mostly work in moist condition and work space does not contain required safety precautions and equipment. It can cause physical injuries as many of them may fall from elevated platform or slip from greasy floors. .[11-15]

Even though a number of studies have explored the relation between auto mechanics and musculoskeletal symptoms and has consistently shown significant relationship, the association between WRLBP and it causing disability has not been studied. This study was conducted aiming at determining the frequency of WRLBP and disability among auto mechanics of Lahore.

Methodology:

180 subjects were enrolled in this cross sectional study using non purposive probability sampling technique. Sample size was calculated using 95% confidence interval and 5% absoulte precision. Mechanics of age 22-40 years, having WRLBP were included in this study and those having risk factors such as recent trauma or other systemic dieseases were excluded. Information was collected using Oswestry Low Back Pain Disability Questionnaire (OLBPDQ) and Visual Analog Scale (VAS). The validity of questionnaire was found sufficient. The data was collected from auto-mobile workshops in Lahore city. Data was analyzed using SPSS 21.

Results:

Frequency of LBP was found to be 69.4% (Table 1).Out of 125 individuals, 87 (69.6%) were minimally disabled, 31 (25%) were moderatley disabled, wheras a small count of individuals 7(5.6%) were severly disabled during ADL' on OLBPDQ (Figure 1). Frequency of mechanincs standing without causing them extra pain was 44(35%), indivduals experiencing extra pain during standing was 47(37%) (Table 2).The response rate in this study was 67%.

LBP	Frequency(%)
Yes	125 (69.4)
No	55(30.6)
Total	180

Table 1 : Frequency of Low Back Pain

Standing	Frequency
I can stand as long as I want to	44 (35)
I can stand as long as I want to but it causes e extra pain	47(37)
Pain prevents me from standing more than 1 hour	23(18)
Pain prevents me from standing more than half hour	8(6)
Pain prevents me from standing more than 10 inutes	2(1)

Table 2: Frequency of standing disability among mechanics

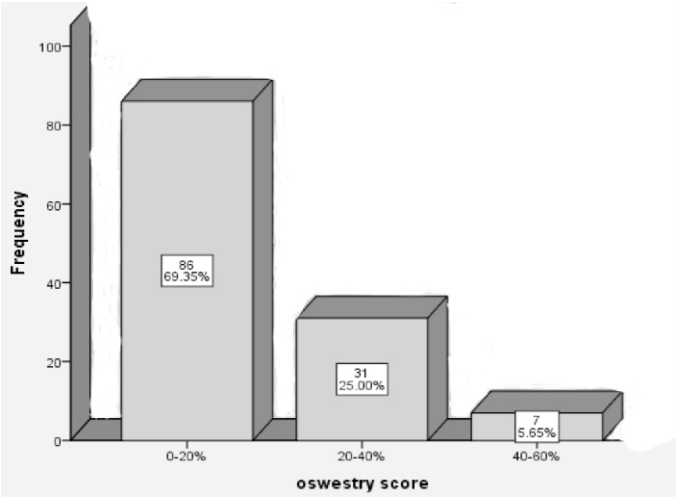

Figure 1: Frequency of Disability on OLBPDQ

Discussion:

This study documented WRLBP and Disability among automobile mechanics which was 69.4% in Lahore city. In Bangladesh it was reported that the burden of LBP in auto repairers was 67%.[16] In developed countries such as Norway, where the prevalence of LBP was 76%[17] in automobile mechanics which is significantly higher than current results. Mechanics in this study reported that common habit of work was in squat sitting position and frequently transitoned their position from siiting to standing and often lifted heavy weights. A study conducted by Levangie 18 demonstrated a direct interrelation between lifting as a risk factor for LBP.In common practice mechanics attain unnnautral postion of spine thus compressing and overstrechting the sructures beyond their natural limit.[8]

In this study it is found that 48 individuals could stand for long duration but it caused them extra pain. The most regular finding was agonist-antagonist muscle coactivation.In a study conducted by Nelson and *et al.* [19] demonstrated co-activation of gluteus medius in subjects developing LBP during prolong standing. In this study the response rate was 67% which is low as compared to similar study conducted in developed countries.[17] A pretext for this difference might be that developed countries have established framework regarding occupational health , wheras in Pakistan a developing country conventional framework is lacking .Similar response rates have been seen in other study conducted in Pakistan.[20]

Job dissatisfaction, increased workload and low wages are considered as trigger psychosocial variables.Several startegies are used to subsist the stressors including avoidence from work, attainment of specific posture during work.[21]

Sleep was occasionally disturbed in 45 (36%) and 23 (18.40%) individual could only sleep less than 6 hours. This can be attributed to the psychological factors such as anxiety and burnout and muscle fatigue due to faulty posture. Numerous studies point out the fact that anxiety and burnout cause decrease in sleep.[22] Moreover, workstation ergonomics were found major contributor to anxiety in comparison to socio demographic variables and job nature.[23]

Muscle weakness can be caused due to high work demands. Muscle weakness can be defined as a condition in which muscle does not give the required ouput. Muscle weakness can be accounted as a major cause of functional disability and low back pain as a end result.[24] In contradiction to a research that was

conducted in 2018 by Jamdade showed that AP a probable cause of LBP. But, the conclusion of contemporary systematic reviews rejects these universally acknowledged facts. The study demonstrates absence of corelation between work-related posture and LBP. They examined standing sitting and twisting, non ergonomic postures like kneeling or squatting, and prolonged sitting at work and leisure time are not associated with back pain. [10]

Conclusions:

Frequency of LBP was high among automobile mechanics. Majority of the individuals suffering from LBP had minimal disability and rate of moderate disability was also remarkable but fewer numbers of mechanics suffered from severe disability. LBP was identified as a major contributor in decline of quality of life.

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