Prevalence of Forefoot Pain among occupational bus drivers

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Abstract- Background: Forefoot pain is a work-related musculoskeletal disorder. Professional drivers were at higher risk of developing forefoot pain due to prolong sitting and repetitive motions such as braking and pedaling.

Objective: The aim of the study was to determine the prevalence of forefoot pain amongoccupational bus drivers.

Methods: A cross-sectional study was conducted to determine the prevalenceof forefoot pain in occupational drivers. Study duration was six months. The foot function index scale was distributed among 377 male occupational drivers. Non-probability consecutive sampling technique was used. The male occupational drivers with ages between 20-44 years with at least 1 year of experience were included. The drivers with systemic, foot, and neurological disorders, and arthritis were excluded. The foot function index scale was used to measure the outcomes.

Results: The results of this study showed that 38.9% had no pain in the forefoot while 37.0% had mild pain in the forefoot whereas 24.1% had moderate pain.

Conclusion: The conclusion of the study shows that mild pain was more prevalent in occupational bus drivers.

Index Terms- Automobile Driver Examination, Cumulative Trauma Disorders, Forefoot, Foot Deformities, Pain Assessment.

I. INTRODUCTION

Driving a vehicle is a normal work task. Millions of people rely on those who have dedicated their careers to life behind the wheel.(1) Professional bus drivers are particularly prone to musculoskeletal disorders (MSDs) due to prolonged sitting, repetitive motions, vibrations and inappropriate positions. (2) The foot has 26 bones (tarsals, metatarsals, and phalanges), which are divided into groups called the hindfoot, midfoot, and forefoot.(3) Walking on different ground levels after prolonged exposure to driving illnesses contributes to a high prevalence of work-related injuries(4).The metatarsal and phalanges are the two most common areas in the foot that are affected by forefoot pain. (5) Forefoot pain is a work-related musculoskeletal disorder that was aggravated either by the environment of the work or by the work itself. Previous studies explained that bus drivers (80%), truck drivers (81%) and taxi drivers (71%) had low back pain (LBP).(6) Some factors that contribute to pain are long driving time, continuous use of brake pedals (especially theuse of the right leg), poor diet, and poor posture and psycho social factors. (7). As forefoot pain is a medical care condition, it also impacts the quality of life, but the persons do not consider it a serious disease. (8) Past searches have shown a high incidence of forefoot pain in professional drivers, including cramps and spasms in the ball of the foot. (9). Foot pain can be caused by several conditions. these disorders are accurately assessed by using magnetic resonance (MR) imaging. (10) The effect of continuous driving could be a major cause of musculoskeletal pain (foot pain with64.4%) in a drivers (11)Due to severe adverse conditions, professional drivers are often exposed to many challenges that affect their health and expose them to WRMSD, these severe conditions include traffic jams, prolonged time constraints, excessive physical demands, etc. (12).

The previous researchers focused on leg, ankle and foot pain rather than forefoot pain, which is also affected by repetitive use of pedaling and braking in drivers. And there are alimited number of studies on forefoot pain in Pakistan. This study focused on the pain in the forefoot region in occupational drivers who worked in harsh environments withprolonged hours of driving.

II. IDENTIFY, RESEARCH AND COLLECT IDEA

The study design was cross sectional study. The sampling technique was non-probability convenient sampling. The duration of the study was 6 months after the approval of synopsis. The data was obtained from few bus stations in Lahore. The sample size was 377 calculated by Rao software. Target population was occupational bus drivers. Inclusion criteria was focused on male occupational bus drivers, the drivers who have more than 1 year of experience and age between 20 to 44 years and working duration of 8 hours a day. Exclusion criteria was drivers who have arthritis, foot disorders such as Hallux Valgus, hammer, claw foot, and mallet toes and any systemic diseases like diabetes and hypertension, neurological andcardiovascular disorders. The foot function index scale was used to measure the outcomes. SPSS version 24.0 was used. Categorical variables, frequency and variables were used to analyze continuous data means± SD.

RESULTS

A cross-sectional study was conducted to determine the prevalence of forefoot pain in professional drivers. The total number of bus drivers was 377. Out of 377 participants, the maximum falls within the 30-44 age range. This indicates that the ages of bus drivers are fairly spread around the mean. The Mean and SD of given data is 32.80±6.965.
To collect the data the foot function index scale was distributed among 377 male occupational bus drivers.
Foot function index mentioned that 38.9% (n=147) bus drivers had no pain or difficulty, 37.0% (n=139) had mild pain or difficulty while 24.1% (n=91) had moderate pain or difficulty in foot functions.

Table 1:Descriptive Statistics of Age.

Mean	32.80
Std.Deviation	6.965

St. Deviation= Standard Deviation

Table 2:Interpretation of Foot Function Index

Interpretation of Foot Function Index	Frequency	Percentage
No pain or difficulty (0-30)	147	38.9
mild pain or difficulty (31-70)	139	37.0
Moderate pain or difficulty(71-145)	91	24.1
Severe pain or difficulty (146-230)	0	0.0
Total	377	100.0

DISCUSSION

Cross-sectional survey was conducted to find the prevalence of forefoot pain among occupational bus drivers. Few studies on automobile drivers have been done before. The data was collected from 218 bus drivers. That gave us the conclusion about forefoot pain specifically having prevalent moderate pain.

The main focus on this study was pain in the frontal part or forefoot among occupational bus drivers. Although there are very less studies on forefoot specifically however there are several studies comparable to the new study. This would allow and help the better understanding of forefoot pain or other musculoskeletal disorders.

In 2021 Sayli et al. conducted a study in India to assess foot pain by using the footfunction index in drivers. They had to work in very awkward situations such as prolongeddriving. The aim of their study was to determined function of foot in taxi drivers. Convenient sampling study had been conducted to signify the difference between the left and right foot in drivers. 90 male taxi drivers between the 40- to the 50-year-old age group were selected with complaints of pain. Estimation by Foot Function Index scale. The resultof this study showed that there was a difference between the right and left foot among drivers. They included studies on professional drivers related to seat comfort, but less focuson how the feet and ankles are affected by pedaling. In association with pedaling this studyinspected the two-sided foot pain scores(13) Current study shows that constant breaking on the pedal may cause forefoot pain among bus drivers. When the driver constantly presses on the break and then rest it causes pressure on the forefoot area causing pain.

In 2020 Pradeep, et al. Conducted a research in South India that in many countries there was an economic loss due to work-related health problems. Even though driving may seem like a sedentary job, it is one of those occupations with many risk factors contributing to work-related musculoskeletal disorders (WMSD) because of the type of the job and the work structure. The purpose of their study was to measure the prevalence of WMSD and its related risk factors among the bus drivers of Karnataka. The subjects considered in their study are 301 full-time bus drivers from the Central Division KSRTC, which consists of 6 depots in Bengaluru. According to their study, they have the symptomsfrom 7 weeks to 12 months.Their health was conducted by standardized Nordic questionnaires and direct observation. Face-to-face interviews were conducted by the drivers in their study. Several work-related and lifestyle/health-related factors show significant associations with WMSD in Karnataka bus drivers. The study concluded that there was an association between lifestyle/health related factors and work-related musculoskeletal disorders(14). This current study shows that sedentary lifestyle, no proper working environment and poor management can lead to WMSD's specifically forefoot pain and dysfunction.

In 2023 Nabi at el. Conducted a study that showed Poor driver seat condition was observed to have an ergonomic effect on the driver and increase the likelihood of LBP in logistic regression. In a study of US bus drivers, drivers who had to use uncomfortable seats had an eight times higher risk of LBP. As reported by epidemiological studies, musculoskeletal problems such as LBP result from postural stress due to prolonged sitting in the wrong driver's seat without good lumbar or back support. (2) Current study shows that prolong hours of driving and being seated for more than 5 hours causes forefoot pain in bus drivers. In 2014 Abledu et al.conducted a research in Ghana on minibus drivers. Their research concluded that populations with reduced activity and prolonged hours of driving must be targets for strategies that are preventive and can lessen the incidence of disorders among drivers. (15). Here another study concluded about prolonged working hours causes disorders but current study shows that bus drivers can be targeted by forefoot disorder or pain by prolong working hours or being seated for more than 5-8 hours.

III. CONCLUSION

The conclusion of the study shows that mild pain was more prevalent in occupational bus drivers.

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