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# *Assessment of Musculoskeletal Discomfort Among Mini-Bus Drivers In Osun State, Nigeria*

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**Abstract – There have been many reports on the physical factors contributed to the development of work-related musculoskeletal disorders (WMSD) which have a negative influence on the health of employee across different occupations including bus drivers. This study focuses on the assessment of musculoskeletal disorders among mini-bus drivers popularly called "Korope" in the Osun State of Nigeria. This research is based on questionnaires extracted from the standard Nordic questionnaire for the assessment of musculoskeletal disorders (MSDs). The results obtained from the questionnaire showed that the low back, knee and the ankle/feet were found to be the most common areas of discomfort among the population. The elbow showed the least area of musculoskeletal discomfort while the shoulder,upper back, neck, thigh/hips and the wrist/ hands showed moderate discomfort. Some of the subjects experienced at least two of the discomforts.**

**Keywords – Disorders; Low-Back; Drivers; Discomfort**

## I. INTRODUCTION

Musculoskeletal disorders (MSDs) are conditions affecting the muscles, tendons, nerves, ligaments, joints or spinal discs. Musculoskeletal system disorders represent the main cause for absence from occupational work and leads to considerable costs for the public health system. It is also a leading cause of disability, work time loss and economic loss in both industrialized and developing countries. Awkward working posture is associated with an increased risk for injury. There is an increase in the rate of musculoskeletal disorders (MSDs) among workers and bus drivers in Nigeria. Professional bus drivers risk developing musculoskeletal pain (MSP) and disability due to their working condition. (Kasemsan, *et al*., 2020). Some of these disorders are mostly being treated with the use of local herbs popularly called "agbo jedi" in Yoruba language parlance.. However, these local herbs have done more damage than good to those affected. MSDs contributed to lost man-hours, disability of workers and financial losses which affect both individuals and the society at large (Choobineh, *et al*., 2011).

Musculoskeletal disorders (MSDs) affect tendons, nerves and muscles which are the supporting structures of the body. MSDs in the work environment are referred to as Work-related Musculoskeletal Disorders (WMSDs); they can result in symptoms of discomfort in the body besides productivity and financial losses, absenteeism, and disability of workers (Lei et al., 2005). A study in Ghana revealed 71 % of minibus drivers sustained WRMSDs. Lower back and upper back pain constituted 34 % and 17 % of injuries respectively (Abledu *et.al*. 2014). MSDs contribute to repetitive work, static and extreme postures at work, and work including forceful arm and hand movements. Driving a bus is stressful, physically and mentally demanding and requires absolute concentration due to heavy traffic in urban areas and dealing with passengers and other motorists. Minibus

drivers experience the vibration of the whole body daily which increases the possibility of musculoskeletal disorders. Moreover, minibus drivers are expected to stick to a strict schedule and providing a safe trip for their passengers. Therefore their job can be classified as high demands, low control and low support, leading to the development of MSDs. Hence, this study aims to determine the prevalence of MSDs and their associations with work factors among bus drivers in Osun State. The Nordic Musculoskeletal Questionnaire (NMQ) which provides a detailed measure of musculoskeletal disorders was used.

## II. Literature Review

Work-related musculoskeletal disorders (WMSDs) constitute a significant proportion of occupational morbidity, lost workdays, and costs (Silverstein et al., 2009). Work-related musculoskeletal disorders (WMSD) related to repetitive and demanding working conditions continue to represent one of the biggest problems in industrialized countries. Nunes, *et al*.(2012). Akinpelu *et al* (2011) reported the prevalence of WMSDs at the lower back (64.8%), 30.8% shoulder, 27% knee, 17% neck and 2.6% upper back among occupational drivers in Ibadan. In Lagos, the prevalence of back pain among commercial drivers was estimated as 64.5%, with 6 59.3% lower back and 1.7% upper back/neck. . Maduagwu *et al* in a study in 2020 reported that the lower back was the most common body region affected in WMSDs with a 12-month and weekly prevalence of 71.7% and 35.8% respectively, and 34.0% annual disability among occupational drivers in Mubi, North-East Nigeria.

Previous studies have shown that poor design is a major risk factor responsible for the uncomfortable conditions minibus drivers are subjected to while on their job. The duties of drivers comprise of many tasks related to the management of old buses in most cases, in an unfriendly traffic environment which may include unmanaged heavy traffic, bad roads and corrupt traffic officials. A study in 2014 by Brimah *et al*., affirmed that 57% of 149 respondents used herbs concoctions, "Agbo" to treat their musculoskeletal disorders and low back symptoms and less than 10% visited an orthodox physician. Over the years, work-related musculoskeletal disorders (WMSDs) have attracted increasing interest from the occupational health community. They are considered the main cause of disability, time off work, and requests for health care (Sluiter, et al, 2001).

In Nigeria, the prevalence of WMSDs varies among different occupational groups; the prevalence is 91.3% among physiotherapists, 78% among nurses, and 64.4% among health care workers. The 12-month prevalence of WMSDs was found to be as high as 93.2% among computer users in Nigeria (Ayanniyi *et al,* 2010.). However, the rate of work-related musculoskeletal disorders among "Korope" drivers has not been extensively done.

Funakoshi, *et al*., in 2004 showed that professional bus drivers have a higher risk of WMSDs due to exposure to prolonged sitting and vibrating tendencies.

## III. Methods

The Nordic Musculoskeletal Questionnaire was used because of its widespread validity, and as a reliable cost-effective means of determining self-reported musculoskeletal disorders. This study was based on the standard Nordic questionnaires among minibus drivers in Osun State, South-West Nigeria. Three major towns were considered which are Oshogbo, Ede and Gbongan. 151 drivers were randomly selected to participate in this survey. Personal discussion and verbal explanation of the questionnaire was done in the Yoruba language with most of the drivers because of their literacy level. The questionnaire comprised of two sections; demographic information and musculoskeletal disorders complaints.

The first section of the questionnaire comprised of demographic data such as age, gender, marital status, the kind of employment type (full-time or part-time) and education. The second section of the questionnaire collected data relating to musculoskeletal disorders employing the Standardized Nordic Questionnaire for musculoskeletal complaints. (Kuorinka *et al.*1987). The body parts surveyed in the Nordic questionnaire were neck, shoulders (right, left and both), elbow (right, left and both), forearm (right, left and both), wrists/hands/fingers (right, left and both), dorsal region, lumbar region, hips and/or thighs, knees, ankles and/or feet. Nine variables were considered which indicates the nine sites of the body which were considered.

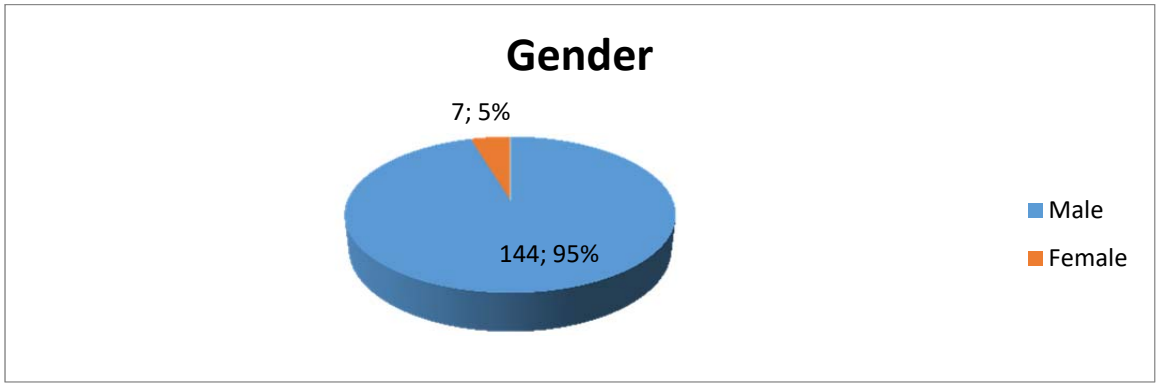
## IV. Results

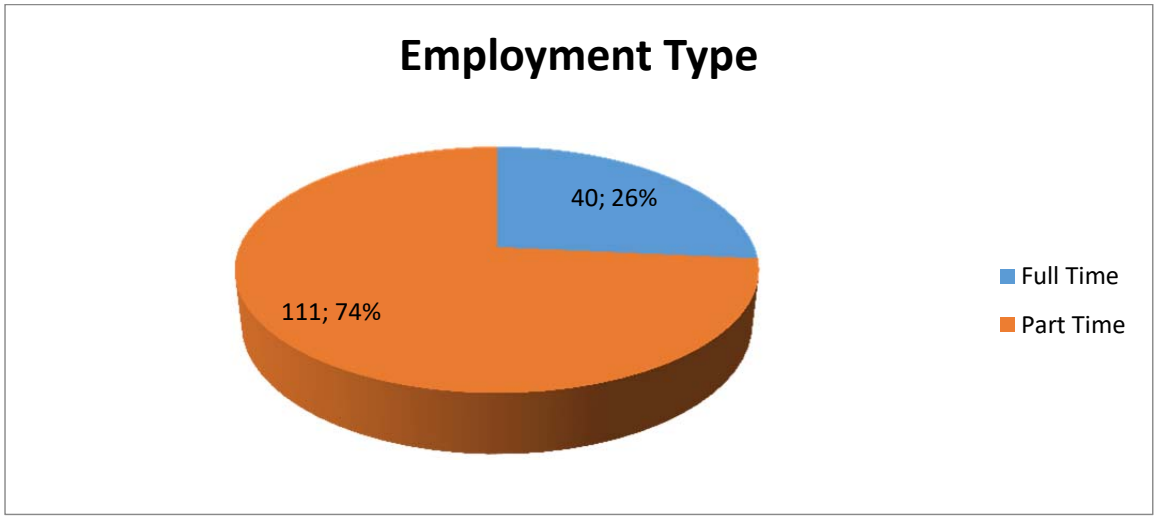
Altogether 151 subjects completed the questionnaire consisting of 144 males and 7 females respectively. Mean and the standard deviation of age were 42.12 and 13.28 respectively. The mean and standard deviation for work experience were 7.51 years and 3.74 years while the mean and standard deviation for work hours per day were 6.75 hours and 1.8 hours respectively.

Table 1 gives an overview of the demographic information gathered and job characteristics reported.

**Table 1:** Demographic and workload overview of mini bus drivers

| | | |
|---|---|---|
| Gender | | |
| Male | 144 (95.2%) | BAR CHART |
| Female | 7 (4.8%) | |
| Age (Years) | Mean = 42.12 | S.D = 13.28 |
| Work Experience (Years) | Mean = 7.51 | S.D = 3.74 |
| Work Hours per day (Hours) | Mean = 6.75 | S.D = 1.81 |
| Kind of Employment<br>(Part-Time of Full Time) | 40(26.49%) and<br>111(73.51%) | |
| Education<br>(No Education<br>Primary School<br>Secondary School<br>University Education) | <br>22(14.57%)<br>34(22.52%)<br>69(45.70%)<br>26(17.22%) | |



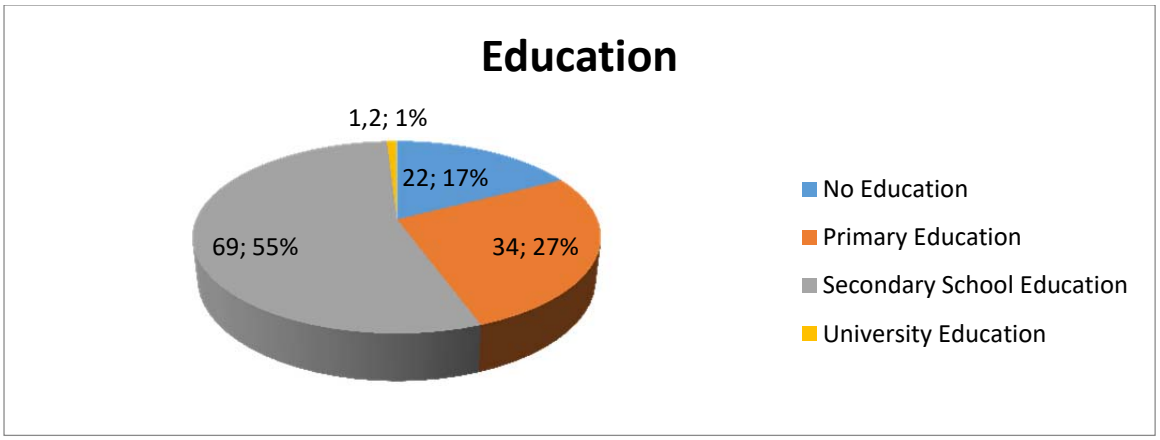



**Figure 1:** Showing the Demographic Information

To assess the prevalence of WMSDs in the past 12 months, the subjects determined areas of discomfort in their body using the Standardized Nordic Questionnaire.

Figure 2 shows that the low back, shoulder, upper back, and neck were the foremost areas of discomfort identified by the bus drivers. The results show 80.80% (n=122) of the drivers have experienced pain in the low back in the last 12 months which is considered as the most common body discomfort among bus drivers. The second most area of discomfort identified is the knee with 68.2% (n=102) and the third most related musculoskeletal discomfort is the ankle/feet comprising of 60.93% (n=92) of all participants. The elbow is the least area with discomfort with 17.22% ( n=26). Other areas where musculoskeletal discomfort were experienced are shoulder with 53.64% (n=81), upper back with 54.31% (n=82), neck with 48.34% (n=73), thigh/hips with 31.80% (n=48), and the wrist/hands with 42.38% (n= 64).

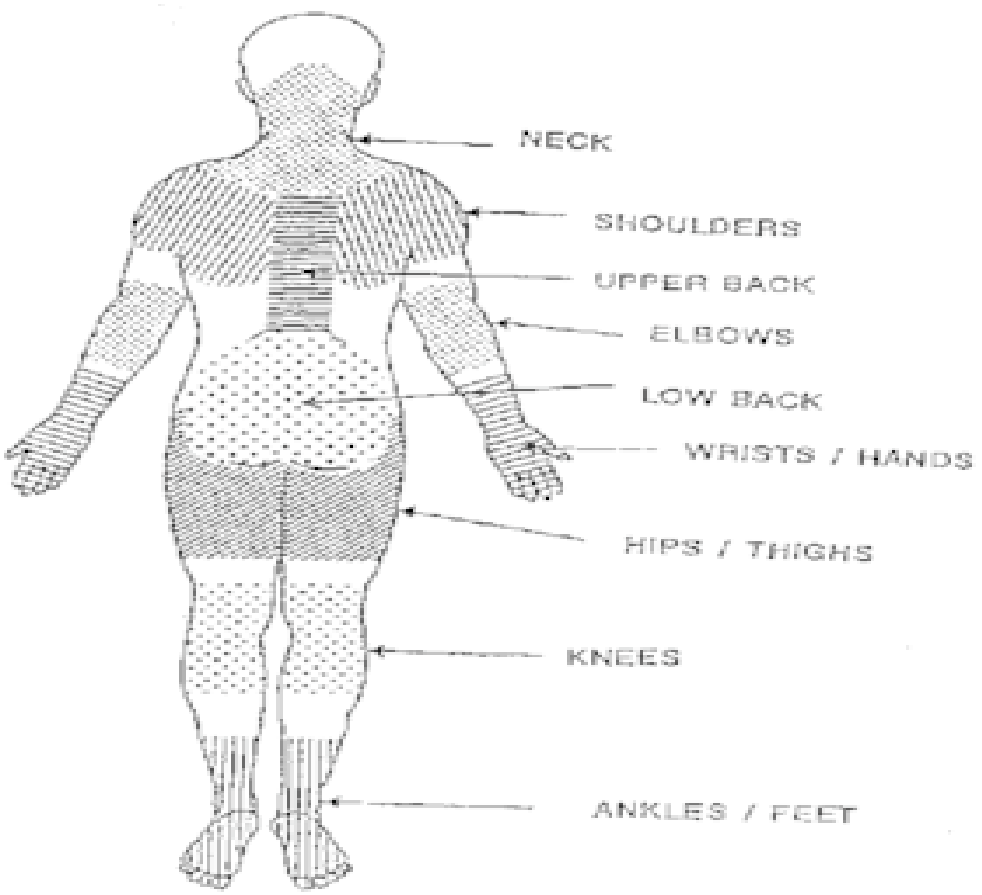



**Figure 2:** Showing the parts of the body assessed using the Nordic Questionnaire

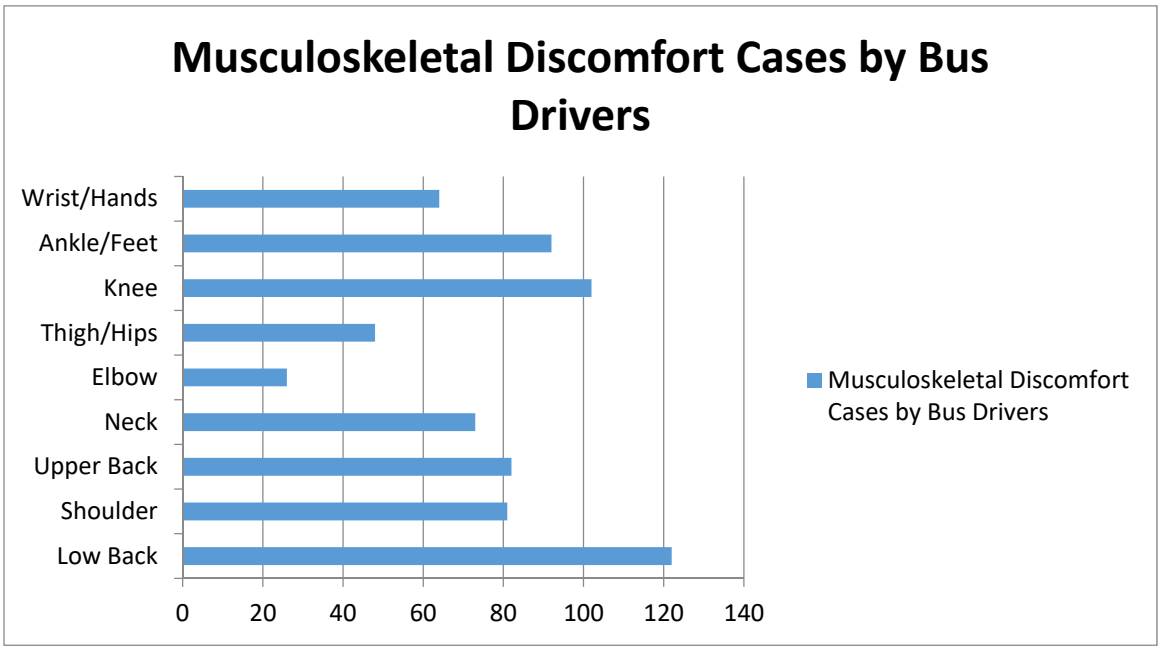



**Figure 3:** Musculoskeletal Discomfort Cases by Bus Drivers

## V. Discussions

The continual occurrence of musculoskeletal disorders among the mini bus drivers particularly in Osun State of Nigeria and the risk factors that contributed to these WMSDs were determined in this cross-sectional study. Based on the results obtained from the self-reported questionnaire, low back, knee and the ankle/feet were found to be the most common areas of discomfort among the population. The elbow shows the least area of musculoskeletal discomfort while the shoulder, upper back, neck, thigh/hips and the wrist/ hands shows moderate discomfort. From the results, it is noted that all the subjects in the population experienced at least two of the discomfort.

The prevalence of work related musculoskeletal disorders will be reduced with contual reporting and further studies done to identify the hazards as well as develop prevention strategies. In this study, an uncomfortable seat and uncomfortable back support were found to be associated with a higher prevalence of LBP among the minibus drivers. They often maintain awkward body postures for extensive periods during their work. These postures include slumped sitting, leaning on one side, bending and twisting, and excessive reaching. Drivers sometimes adopt awkward postures to avoid discomfort caused by a poor ergonomic chair.

These positions, combined with an uncomfortable chair, can place mechanical stress upon the spine and its surrounding soft structures and ultimately cause back pain and other associated discomforts in the studied body parts.. A poor ergonomically designed chair, with an uncomfortable seat and back support in combination with an incorrect steering wheel position, may cause or contribute to awkward body postures; also, prolonged sitting and driver-seat mismatch are significant occupational risk factors for the low back, shoulder, upper back, neck, knee, ankle/feet, elbow, shoulder, thigh/hips and the wrist/hands. These discomforts were found to be related to the age of the subjects, that is, those above the age of 60 years presented discomforts in at least two areas. The length of the hours of work also contributed to these discomforts. The mode of employment (full time or part-time) was found to be a contributing factor to the prevalence of musculoskeletal disorders in mini bus drivers.

## VI. Conclusion

This study found a high prevalence of musculoskeletal symptoms of low back, knee and the ankle/feet, moderate musculoskeletal discomfort in the elbow, shoulder, upper back, neck, thigh/hips while the least discomfort were in the wrist/ hands and a significant association between psychosocial factors, specifically job demand and control at work with WMSDs. The findings of this study revealed that psychosocial work factors are significant criteria in the development of WMSDs, and these factors should have been taken into account in successful ergonomic intervention plans. This work was limited to a cross-sectional based study, and therefore can be extended to a longitudinal study to get more reliable and precise results, and to investigate the predictive role of different factors in the development of WMSDs among bus drivers in Osun State of Nigeria. However in this survey exposure to physical factors associated with musculoskeletal symptoms is not considered, thus a broader and more complex scope of physical and psychological criteria in the development of WMSDs has a great contribution to the understanding of the problem. The findings of this research enhanced understanding of musculoskeletal discomforts within the working population of the minibus drivers studied.

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