PREVALENCE AND RISK FACTORS FOR LOW BACK PAIN AMONG TRUCK DRIVERS IN DAR ES SALAAM

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Master of Public Health Dissertation

Muhimbili University of Health and Allied Science

October, 2013

PREVALENCE AND RISK FACTOR FOR LOW BACK PAIN AMONG TRUCK DRIVERS IN DAR ES SALAAM

By

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree Of Master of Public Health of Muhimbili University of Health and Allied Sciences

Muhimbili University of Health and Allied Sciences

October, 2013

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance of dissertation entitled **'Prevalence and risk factors for low back pain among truck drivers in Dar es salaam"** in fulfillment of the requirements for the degree of Master of Public Health of Muhimbili University of Health and Allied Sciences.

…….

Dr. S. Mamuya (PhD)

(**SUPERVISOR)**

Date……

DECLARATION AND COPY RIGHT

I, Pharles Joseph Yikobela hereby declare that **"Prevalence and risk factors for low back pain among truck drivers in Dar es salaam"** is my own original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

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A**CKNOWLEDGEMENT**

To Almighty God for guiding, granting me good health and strength throughout my study period. I did not deserve this more than others but it is because of your will for all the things happened.

Secondly, I wish to extend my sincere gratitude to my supervisor, Dr. Mamuya for his tireless dedication, commitment, critical review, guidance, constructive comments, understanding and assistance that led to successful accomplishment of this dissertation. I am very grateful to Dr. Kayumba and Mr. Materu for their support.

My sincere gratitude goes to Pwani Hauliers Company Limited Management particularly Mr. Chaulo, Kizito and Vero for allowing me to collect data at their workplace. I would like to thank the truck drivers for actual participation in the study during data collection, as without them this work could have not being accomplished.

My sincere gratitude goes to Arafa Mbagala Kuu Dispensary workers for their unfailing support, advice and encouragement, they played a big role to make my goal achievable and for their spirit of working hard during my absent.

On the same note I appreciate the support of my research assistants, Sisekwe, James and Rugaiganisa, your support is highly valuable. I extend my thanks to Mr. Mchome and Ruvuba for their hardworking in data capturing, data retrieval and analysis, their efforts make me achieve my study objectives.

Last but not least, I am very much thankful to my family. To my beloved wife Happiness Ballama, for her valuable support during my studies and relaxing the entire household tasks so that I can give more time for my schooling. I am deeply impressed to my children, Kelvin, Vanessa, and Scholastica who were by my side always when I am back home after my classes. Thank you ALL.

I am utterly responsible for all errors and omissions if any.

DEDICATION

I dedicate this work to my family especially my wife and my children, their encouragement, understanding and tolerance is highly appreciated

To my mother Scholastica Yikobela and my late father Joseph Yikobela who laid the foundation of my education, I say with this piece of work there is a light at the end of the tunnel

ABSTRACT

Background: Lower back pain is among the major and growing health and economic problem affecting almost developed and developing world. Low back pain continues to be the most common musculoskeletal problem in the work place. It affects many workers and contributes to high costs to the companies and individuals.

Objective: The aim of this study was to assess the magnitude and risk factors for low back pain among truck drivers in Dar es Salaam

Methods: A cross-sectional survey using quantitative research methods were used, where by 415 , truck drivers were interviewed by using structured questionnaire consisting of close ended questions and body weight in kg was measured by using weighing scale machine and tape measure used to check height in cm ,BMI in kg/m^2 was calculated by using calculators. Pwani Haulier Company located in Temeke which has 900 trucks and 1000 drivers was chosen for the study. Simple random sampling using lottery method was used to select 415 respondents. Validity and reliability of data questionnaires were tested to forty one truck drivers. The collected data were analyzed using the computer software program (SPSS version 16).

Results: Findings revealed a high prevalence of LBP among truck drivers in Dar es Salaam as presented by 88.7% of all study respondents. Moreover, suitable truck seat and adjustable lead restraint and lordosis pad were associated with LBP. Consequently the findings revealed that car vibration, BMI, resting time, work experience, age as well education level showed to have statistically no association with LBP among truck drivers in Dar es Salaam.

Conclusion and recommendation: This study identified a high prevalence of LBP among truck drivers in Dar es Salaam. With these findings it is highly recommended that truck seat as well as adjustable lead restrains be used so as to reduce LBP among truck drivers. Moreover other studies should be carried out to determine other factors which might contribute to LBP among truck drivers, abreast the proper preventive intervention to mitigate this occupational health problem should be well known to all stakeholders.

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LIST OF ABBREVATIONS

BMI:	Body Mass Index
Co:	Company
DSM:	Dar es Salaam
LBP:	Low Back pain
MoHSW:	Ministry of Health and Social Welfare
MoH:	Ministry of Health
MUHAS:	Muhimbili University of Health and Allied Sciences
NIOSH:	National Institute of Safety and Health
OSHA:	Occupational Safety and Health Authority
TSHS:	Tanzania Shillings
USD:	United States Dollar
WHO:	World Health Organization
WBV`:	Whole Body Vibration

OPERATIONAL DEFINITIONS

Low Back Pain: Low back pain (LBP) is defined as pain localized between the 12th rib and the inferior gluteal folds, with or without leg pain. The pain can be acute or chronic pain, ache or stiffness experienced by the people (18, 19).

Professional Truck Drivers: Professional Truck Drivers are individual trained to carry out transportation activities which include driving heavy cars, like semi truck, box truck, or dump truck. The Professional truck drivers provide an essential service to societies by transporting finished goods and raw materials over land, typically to and from manufacturing plants, retail and distribution centers.

Risk factors: A risk factor is any attribute, characteristic or exposure of an individual that increases the likelihood of developing a disease or injury. Some examples of the more important risk factors are underweight, Age, Obesity, vibration and duration of driving.

Obesity: Is defined as the accumulation of excess fat in the body and this arises as a result of an imbalance between energy expenditure and energy intake Excessive fat deposit into the body presents a high risk to driver's health.

Overweight: Is generally defined as having more body fat than is optimally healthy. Being overweight is a common condition, especially where food supplies are plentiful and lifestyles are sedentary. Overweight is presented by BMI of more than 24kg/m^2

Prevalence: Is a frequently used epidemiological measure of how commonly a disease or condition occurs in a population at a particular point in time.

CHAPTER ONE

1.0 INTRODUCTION

1:1 Background Information

Lower back pain is among the major and growing health and economic problem affecting almost all human populations worldwide. Low back is associated with significant economic loses to individuals as well as to the community (1). Generally it has been suggested in many literatures that up 80% of the population has presented or will present an episode of low back pain at some period in their active lives(2) although this figure may relatively vary from one country and another. A study done in Denmark showed that an average of 62% of Danish population between the ages of 30 to 60 years has experienced pain or other trouble with their lower back at some period in their life (30). In addition 7-8% of occupationally active men have reported to be sick each year because of low-back pain. In USA 4% to 5% of the population has an acute low back pain, which indicates that in USA alone an additional of 11 to 13 million people will develop low back pain annually. Much of this low back pain is associated with occupational factors (4).

Functionally, the low back or lumber area provides structural support, movement, and protection of certain body tissues (5). Low back pain can arise from the anatomical organs of the low back which are bony lumbar spine, discs between the vertebrae, ligaments, muscles, spinal cord, internal organs of the pelvis and skin covering the lumber area[5]. It runs between the lower ribs and the glutei and can be related to multiple causes which are neoplasias, inflammatory and infectious diseases, systemic bone alterations, congenital abnormalities, degenerative changes, visceral and psychogenic diseases, trauma and mechanical causes(5).

Truck drivers do experience a unique health complications related to their work which affects negatively their physical and muscular health. Among many complications low back pain are quite common. Low back pain often results from overuse or misuse of the muscles and joints of the lower back when an individual is at work. Long distance Truck drivers are at higher risk of developing low back pain than other occupations.

This risk is highly associated with exposure to hazards like whole body vibrations, lifting of heavy or awkward postures, improper sitting position, shocks, stress, jumping up and down from the truck and psychosocial issues (6).

Low back pain is considered to be one of the most debilitating disorders of the human musculoskeletal system. It is one of the most common reasons for missed work and decreased productivity in the United States (6). Various studies have demonstrated that lower back pain is the leading cause of workers compensation claims in US (7) and second most common cause of work loss in industry. Anderson(7) claimed that in US, lower back pain is the most common cause of activity limitation in people younger than 45 years, and is the second most frequent reason for visits to the physicians, the fifth-ranking cause of admission to hospital, and the third most common cause of surgical procedures. In Japan low back pain is claimed to be a serious problem leading to huge worker's compensation and a decline in productivity (8).

It was estimated that globally work-related low back pain cause 818,000 disability-adjusted life years lost annually (9). In Brazil, low back pain caused chronic disability leading to high expenses of treatment and absenteeism as well as presentism at work place. About 80% of the South African work force suffers from a degree of incapacity due low back pain at some point in their working life (1). In other African countries such as Rwanda and Uganda LBP is also distressing health problem imposing a severe economic and social burden to the communities and governments due to its higher costs of management (1, 10).

The prevalence of low back pain is extremely high in both developed and developing countries. However it is evident in most literatures that the prevalence is relatively higher in developed than in developing countries. The prevalence of low back pain in developed countries ranged from 23% to 60% (1, 7, 11, 12) while generally the lifetime prevalence ranges from 50% to 84%. The lifetime prevalence of 62% among Africans was demonstrated (11). It was also noted that LBP is expected to increase with time and is of occupational health concern 10. In Nigeria the one year period prevalence of LBP is 89.3% (11).

Occupational driving has been associated with high prevalence of low back pain and professional long truck drivers are considered to be highly at risk for mechanical causes of low back pain(9). Due to the fact that truck driving exposes individuals in prolonged sitting, long driving hours, sitting on the same posture for long time, repetitive movements, vibrations, lifting heavy objects, lack of resting time and poor seat inclination these may cause LBP among drivers(11). A study done by Gembun and Kaneda10 demonstrated that the prevalence of LBP was significantly higher in the truck drivers which were 50.3%. In India it was demonstrated that the prevalence of LBP in long distance truck drivers was 73.52 %(13).

Causes and contributing factors for low back pain have not clearly being understood due to multi-factorial nature of its contributing factors. However, it has been proposed that occupational circumstances, physical characteristics, and social-cultural influences could all be possible risk factors to the development of LBP. Anderson (3) ascertained various cross-sectional studies indicate an association between psychological factors and the occurrence of low back pain. These factors include anxiety, depression, somatization symptoms, stressful responsibility, job dissatisfaction, mental stress at work, negative body image, weakness in ego functioning, and poor drive satisfaction.

1. 2 Problem Statement

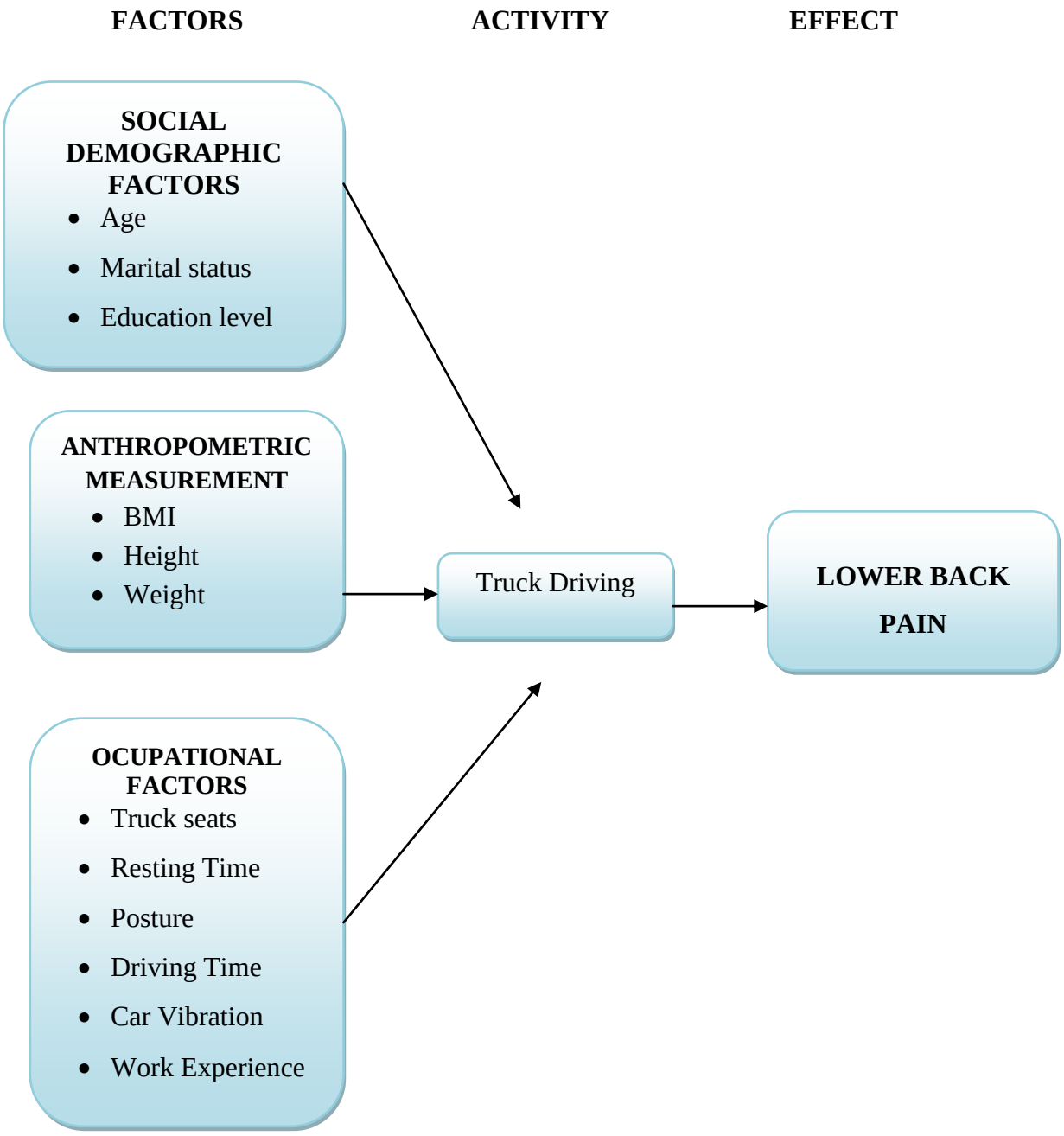
Truck drivers do experience a unique health complication related to their work which affects negatively their physical and muscular health. Among many complications low back pain are quite common especially to professional drivers. The prevalence and factors contributing to low back pain in developed and few countries in Africa have been clearly explained. Generally, in Tanzania, specifically Dar es Salaam, there are very few existing published study addressing the prevalence and risk factors of low back pain among truck drivers despite of their being at risk of the problem. It was estimated that globally work-related low back pain cause 818,000 disability-adjusted life years lost annually[1].

Study done in Brazil showed low back pain to cause chronic disability leading to high expenses of treatment and absenteeism as well as presentism at work place. About 80%

of the South African work force suffers from a degree of incapacity due low back pain at some point in their working life(4).

Causes and contributing factors for low back pain has not clearly being understood due to multi-factorial nature of its contributing factors However, it has been proposed (1, 2) that elderly age, jumping up and down, whole body vibrations, long working hours, awkward posture, lifting heavy equipment, occupational circumstances, and social-cultural influences could all be possible risk factors to the development of LBP. It is against this background that, this study ought to determine prevalence and risk factors of LBP among truck drivers in Dar es Salaam.

1.3 Conceptual Framework



1.4 Rationale of the Study

This study leads to the identification of prevalence of low back pain among truck drivers. It may also enlighten on the factors contributing to low back pain. The study may add value to the existing body of knowledge on the prevalence and risk factors associate with low back pain among truck drivers.

The findings of this study can be useful to Occupational Health and Safety Authority (OSHA) which aim at ensure creation and maintenance of ideal work environments which are free from occupational hazards that may cause injuries or illness to all employees in work environment. (Occupational Safety and Health Act no. 5, 2003). The Knowledge on risk factors associated with low back pain generated from this study may create awareness to the employers and employees which might influence the change through trade union or other mechanisms. Also OSHA may use generated findings in planning preventive services of low back pain and policy development related to reduction of occupational hazards and promotes employees safety and health.

Furthermore, the findings may help OSHA to enforce a law in designing seats following ergonomic principles. This may be an incentive on the part of employers to conduct ergonomic risk analysis and implement appropriate programs to address this growing problem responsible for crippling the labour force with higher prevalence of low back pain.

Additionally, this study attempts to provide information in assessing the prevalence and risk factors of LBP among truck drivers in Dar es Salaam region, this go abreast with awareness creation on risk factors associated with LBP and its impact among truck drivers which may help them in practicing preventive measures.

Furthermore the findings of this study may create baseline information which in turn helps in planning and conduction of a more studies in a more precise ways taking this study as a case study.

1.5 Research Questions

a) What is the prevalence of low back pain among trucks Drivers in Dar es Salaam?

b) What are the associated risk factors for low back pain among truck drivers in Dar es Salaam?

1.6 Research Hypothesis

Hypothesis One:

H0: High number of low back pain problems is explained by an adjustable incline from horizontal pad of the truck seat

H1: High number of low back pain cases is not explained by an adjustable incline from horizontal pad of the truck seat

Hypothesis Two:

H0: Low back pain problems among truck drivers in Dar es Salaam are caused by car vibrations

H1: Low back pain problems among truck drivers in Dar es Salaam are not caused car vibration

Hypothesis Three:

H0: Low back pain among truck in Dar es Salaam are caused by adjustable lead restrain with lordosis pad of truck seat

H1: Low back pain among truck drivers in Dar es Salaam are not caused by adjustable lead restrain with lordosis pad of truck seat

Hypothesis Four

H0: Low back pain among truck drivers in Dar es Salaam is not associated with work experience

H1: Low back pain among truck drivers in Dar es Salaam is associated with work experience

1.7 Study Objectives

1.7.1 Broad Objective

The aim of this study was to assess the prevalence and risk factors causing low back pain among track drivers in Dar es Salaam

1.7.2 Specific Objectives

The study covered the following objectives;-

a) To determine prevalence of LBP among truck drivers in Dar es salaam
b) To determine the occupational factors causing LBP among truck drivers in Dar es Salaam.
c) To determine social-demographic factors causing LBP among truck drivers in Dar es Salaam

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter presents the description of literature review of the prevalence and risk factors which are said to be associated with low back pain in Dar es Salaam. The factor which are going to be detailed in this chapter are truck seat, driving hours, Car vibrations, social demographic factors, resting time and postures.

2.1 Prevalence of Low Back Pain

Low back pain is universal health problem of the musculoskeletal disorder which contributes highly to disability, economic loss and interruption in the quality of life. It affects up to 80% of the general population in both developed and developing countries. The general prevalence of low back pain ranges from 50 to 84%. However, studies have shown that the prevalence of low back pain is higher in western countries (23% to 60%) than in developing countries (64%). The overall lifetime and one year prevalence of LBP in Britain were 58.3% and 36.1%14. A study done in Uganda among patients seen in the outpatient department at Mulago hospital has shown that the prevalence of low back pain was 20%15 and in Nigeria studies have found that the prevalence of LBP was 64.8%.

Low back pain disorders continue to be the most common problem in the workplace (16). It is suggested that professional drivers are at an increased risk of LBP and injuries6. The prevalence of LBP is significantly higher among truck drivers than other professional drivers. Studies done in Japan have shown that the prevalence of LBP among truck drivers in one month of the survey was 50.3% (Nihon 2000) as compared to one year prevalence of 45.8% among taxi drivers (Funakoshi et al 2003). In addition a study conducted in Brazil has shown the prevalence of LBP 59% among truck drivers (2). A one month prevalence of LBP 60% was evident in Israel as compared to one month prevalence of 51% among taxi drivers study was done to establish the effect of mechanical and psychosocial factors in reporting back, neck and shoulder pain and work loss. Cohorts in Sweden and the United States were compared. Results revealed that of the sample, 50% reported low back pain, with no difference between countries (17).

A cross sectional study conducted in Malaysia among military armored vehicle drivers to determine the prevalence of LBP and its association with WBV. The prevalence of 12-months LBP among trucked armored vehicle drivers was higher (81.7%) than wheeled armored vehicle drivers (67%) (14).

2.2 Risk factors for LBP

There are many research reports regarding low back pain among truck drivers. There is evidence that those who spend more than half their working lives driving are three times more likely to suffer back trouble than the rest of the population16. LBP of truck drivers are mainly caused by long hours of driving in a restricted posture, car vibration or shocks from roads, and mental stress associated with driving.

2.2.1 Occupational factors

2.2.1.1 Truck Seat in relation to low back pain among truck drivers

Improper designing of a truck driver seat is a predisposing factor to LBP. The optimal seat would have an adjustable incline of 100° from horizontal, a changeable depth of seatback to front edge of seat bottom, adjustable height, an adjustable seat bottom incline, firm (dense) foam in the seat bottom cushion, horizontally and vertically adjustable lumbar support, adjustable bilateral arm rests, adjustable head restraint with lordosis pad, seat shock absorbers to dampen frequencies in the 1 to 20 Hz range, and linear front-back travel of the seat enabling drivers of all sizes to reach the pedals. The lumbar support should be pulsating in depth to reduce static load. The seatback should be damped to reduce rebounding of the torso in rear-end impacts. The optimal driver's spinal model would be the average Harrison model in a 10° posterior inclining seatback angle (18).

Previous studies have drawn association between the driver's seat and the occurrence of low back pain. According to Najenson et al (17 19, 20) uncomfortable seat were found to be one of the ergonomic factor associated with LBP. Miyamoto et al (1) also found that a two-year LBP among truck drivers was significantly related to suitability of the driver's se at pan. According to the study conducted in Netherland by Punnett et al [7, 10, 19] to determine the body back discomfort level of truck driver for the designed truck seat

the it was found that The truck seat discomfort is associated with travel seat design and duration of driving and buttocks was found to be the most uncomfortable body part to present back pain among truck drivers followed by neck and shoulders (10, 19, 17).

Several laboratory researches have studied the effects of whole-body vibration when a person is sitting in a poor inclined car seat. The lumbar spine has a natural resonant frequency of 4-5 Hz, and results show that this natural frequency can be excited by laboratory simulated vehicle driving, and this can lead to high spinal loadings in the lower back, and this in turn could result in greater postural discomfort and an increased risk of low back pain and injury among drivers[13].

Deferent literature tried to analyze that good car seats should be able to be adjusted 100 degree of inclination; adjustable seat height the seat bottom should be with dense foam that remains firm and they should have horizontal and vertical lumber supports with linear front and seat to allow differently sized drivers to reach the pedal. The absence of this mechanical characteristic of the seat will predispose drivers to both acute and chronic low back pain among them(13).

2.1.1.2 Resting time in relationship with low back pain among truck drivers

Drivers are required to have resting time in between their driving time and after driving, i.e. away from the truck for better health. A truck driver must have a minimum of 10 hours resting in 24 hours. The maximum number of hours a regulated truck driver can work is 72 hours in any 7 days. Short resting time is among of the factor described in the literature to play a big role in the contribution of occurrence of LBP among truck drivers. A study conducted in Sweden to analyze work related health problems among truck drivers found that limited time of resting was subjective to low back pain (21). In the study by Miyamoto et al, (22) also found short resting time to be an associated factor to LBP.

There is evidence that those who spend more than half their working lives driving are three times more likely to suffer low back pain than the rest of the population (23).

2.2.1.3 Postures in relationship with low back pain among truck drivers

Sitting is a source of postural, spinal stress which can be disabling for those who are involved prolonged sitting like truck drivers and can lead to low back pain. Sitting has been associated with risk of developing LBP. If a truck or car is not moving then sitting in a driving sit is not significantly different than sitting in a padded chair. As soon as the vehicle starts to move, however the condition changes drastically. Unlike regular sitting, while a vehicle is in a motion the body is subject to different forces of acceleration and deceleration, lateral swaying from side to side and whole body up and down vibration (24). A systematic review was conducted by Lis et a,(25) to assess association between sitting and occupational LBP and found that sitting alone was not associated with the risk of developing LBP. However, when prolonged sitting is associated with other factors of whole body vibrations and awkward postures the risk of LBP increased fourfold.

According to Nachemson (19) sitting without lumber support with proper inclination, lumber support and lumber backrest could increase disk pressure and the electromyography activities of the back muscles (19). These findings led to the general belief that prolonged sitting is harmful to the lumbar spine; interestingly sitting was even classified as a factor for LBP. Prolonged sitting position has been identified as one of the major risk factors for developing LBP ,according to the study done by Black el at,(26) that body position affects the magnitude of the loads on the lumbar spine, and that the magnitude of the loads increases markedly when sitting compared with upright standing and well-supported reclining(26). Black el at found that The risk for having low back pain while sitting increases significantly as the combination of physical factors such as exposure to whole body vibration and awkward posture plays an additive effect(26).

According to Lis et al.,(25) different studies have shown that there an increased risk of LBP and sciatica for individuals in those occupations that require prolonged sitting (defined as sitting for more than half of a working day) However, the risk increases after combining factors such as WBV and awkward postures(26). According to Troup et al., (27) constrained sitting is associated with an increase in frequency of low back pain.

As the result prolonged sitting there is muscle fatigue in the ligament's or other passive structures of the spine (28).

A study conducted in USA by Danny Goldberg (13) found that working in the same posture like driving can cause episodes low back pain among drivers as, when driving the feet are actively being used, the right foot on the gas (accelerator) pedal, the left on the brake, and in a stick-shift also on the clutch. When the feet are active they cannot be used to support and stabilize the lower body as normally happens when they are placed on the floor during normal sitting in a chair. These constant position changes and instability promote tension and torque of the spine and the muscles surrounding which may cause low back pain (13). Studies have established that postural stress is likely to be associated with low back pain due to disk degeneration (9).

.

According to Even static activities like sitting can cause increased intradisc pressure and increased posterolateral disc force distribution. Nanjeson(19) showed that an intradiscal pressure in the lumbar spine of subjects was 35% greater than the pressure in the standing position. Nanjeson et al, (19) reported that intradiscal pressures with unsupported sitting equaled that with bending forward (20) degrees when lumbar support is added to a chair, disc pressure decreases (29). Several studies revealed that people who spend more than half of their work day in car driving show a threefold increase in risk of disc herniation which may be due to the combined effects of sitting and vibration (30).

2.2.1.4 Driving time in relationship with low back pain among truck drivers

Jensen and Dahl (2009) deducted that truck drivers continued to have lower back pain disorders due to the time spent for driving. In addition Miyamoto et al (8) ascertained that long driving time in a day was one of the contributing factors for the development of low back pain. A study conducted in Brazil by Andrusitis et al., (2) discovered that the only factor correlated with the presence of low back pain was the number of working hours. Chen et al., (6) did a study to assess occupational factors associated with low back pain in urban truck drivers, and found that long driving time and other several physical and psychosocial factors were associated with high prevalence of LBP.

According to the study conducted by Andrusaitis et al., (2) low back pain among truck drivers was highly correlated with the number of working hours than other factors .The number of working hours was the only variable associated with occurrence of low back pain with an average of about 1 hours longer work time for drivers with low back pain compared to those without it(2).

According to the US Highway Patrol, men drive an average of more 44 miles per day this distance need the drivers to spend many hour in driving despite of the Cars makers have made significant advances in comfort for drivers, however, little can be done to remedy the natural forces of physics while driving. When the car is not in motion the driver's body is in a very similar position to a sitting in a standard padded chair the problems is when the vehicle is in motion, this all changes. Unlike regular sitting, while a vehicle is in motion the body is subject to different forces: to accelerations and decelerations, to lateral swaying from side to side and vibrations throughout the body with long driving hours the lower back body structures will be subjective for injury and pain (13)

Long driving time also exposes an individual for engine vibration which can affect the body tissue of the back. According to the study done by Shiel (31) to see the Radiographic and pathologic changes have been noted in drivers exposed to whole-body vibration, evaluated radiographic lumbar spine findings in truck operators. The findings indicated that As the annual number of hours of operation increased, the prevalence of x-ray changes, with findings observed in 61% of operators driving under 700 hours per year, 68% of those who performed 700 to 1,200 hours of operation per year, and 94% of those driving over 1,200 hours per year(31). This study concluded that as an individual spend more time driving the possibility of having lumber pathology is high than those drives for few hours.

Occupational driving has often been associated with a high prevalence of low back pain. The factors that contribute to cause the pain are diverse and might include prolonged sitting, poor postures, exposure to whole-body vibration, and other non-driving factors such as heavy lifting, poor diet or other psychosocial factors. In Europe, truck drivers

are likely to be considered an ‘at risk’ group according to the Physical Agents (Vibration) Directive and therefore risks will need to be reduced.

2.2.1.5 Whole body vibration in relationship with low back pain among truck drivers

A study conducted in UK revealed that vibration presents a high risk of lower back pain in the shock events and likely resulting bending deformation of the Lumbar spine of the truck drivers (32. Whole body vibration is the major cause of musculoskeletal problems especially Low back pain (LBP). In a cross sectional conducted by Leelavanty et al.,(33) revealed that mechanical vibration transmitted to the whole body through seats of the trucks, the most frequently reported adverse effect of whole body vibration were low back pain(LBP),early degeneration of the spine and herniated interverbral disks(33).

A study conducted by Kunribido et al.,(33)comparing the prevalence of low back pain resulting from whole body vibration transmitted due to truck driving among USA and Sweden found that in each country 50% of those questioned reported Low back pain. This study analyzed of the possible reasons for this revealed that long term vibration exposure from driving was among highest risk factors low back pain (LBP).

According to Magnusson et al., (26) several studies have been conducted in USA, Europe and Asia on prevalence of low back pain among truck drivers and revealed that there are is an association between whole body vibration transmitted by the truck engine and low back pain among truck drivers. The effect of whole body vibration on the spine and lumber have being studied extensively by the researchers in USA and Sweden revealed that lower limb ligaments and other soft connective tissue have been reported to become weaker and softer due to exposure to whole body vibration which may cause also low back pain(34).

Back musculature has been reported to fatigue due to exposure to whole body vibration (6). Fatigued posture muscles such as the erector spinal muscles supporting the vertebrae are less effective at sustaining postural stability and therefore increasing the risk of injury leading to low back pain (LBP). A study conducted by Wilter et al. (1)

reported that there was an increased latency of response of erector spinae muscles and an increased magnitude of response when contraction occurred. This evidence suggested that individuals exposed to whole body vibration may be at increased risk of for injury of soft tissue of the spine due to contraction which normally causes low back pain (25).

The systemic review conducted by Lis et al., (25) found that sitting itself does not increase the risk of low back pain (LBP) but sitting more than half a workday, combined with whole body vibration transmitted from truck engines doubling the risk of low back pain among truck drivers(2). According to study conducted in Japan by Miyamoto(22) found that 53% of truck drivers participated in the questionnaire reported that low back pain related to work and mostly pointed out that engine vibration accounted for low back pain(22).

A study conducted in Europe by Robb et al.,(27) to examine the relationship between Musculoskeletal pain and their risk factors 192 truck drivers were given questionnaire to fill, 81% reported to have musculoskeletal pain, among of them 60% reported to have low back pain due to whole body vibration(22). An occupational health report by American National institute of occupational Safety and health (NIOSH) revealed that whole body vibration from the truck engines especially when they in motion have a close association with low back pain among truck drivers (22).

In the cross sectional study conducted in Malaysia involving bus drivers still whole body vibration was noted as a predictor of low back pain among drivers (35). According to Masset et al., (36) when a driver is seating the Lumber spine is continuously in neutral zone and stabilizing function of muscles become more important than use of Ligaments and tendons. During driving the spine is supported poorly and exposed to whole body vibration and in long run can cause injury and hence low back pain (36.

A cross sectional study which conducted in Senegal by Mbage et al.,(23) to determine the prevalence of low back pain and risk factors in a public transport is company by using medical records, sixty nine cases were collected 54% of then were bus drivers and 29% conductors, exposure to vibration was noted as an etiology(23).

Long term vibrations exposure was found to be the highest risk for low back pain in Sweden and US in a study done to analyze the role of exposure to driving and other covariates in reports of back, neck, and shoulder pain and resultant disability (33). In contrast, a case control study was done to investigate risk factors for low-back pain presenting for magnetic resonance imaging (MRI). In contrast to previous studies, results have shown little evidence of a risk from professional driving whole body vibrations. Study went further concluding that WBV is not an important cause of LBP referred to MRI at the population level(17), but the study conducted in USA by Shiri et al.,(37) revealed that Whole-body vibration, especially seated vibration, has been associated with the development of low-back disorders(31) to support this Several mechanisms have been postulated. These include micro fractures at vertebral endplates, vasospasm and decreased blood flow, tissue fatigue from mechanical overload and stretching of spinal structures, and ultra-structural changes in the spinal nerve root dorsal ganglion with biochemical alterations involving pain-inducing neuropeptides all of this can induce low back pain among drivers.

According to a study conducted in Korea by Min et al.(38) revealed that there is a correlation between the type of work and low back pain has been reported(38) in their study, hard manual work, heavy weight lifting, pushing and pulling jobs, jobs at which people are exposed to continuous whole body vibration (i.e., truck drivers) and work that requires sitting for long periods of time have been considered relevant risk factors (1,39, 41, 40)

2.2.1.6 Work Experience in relationship with low back pain among truck drivers

Research conducted in Brazil by Andrusaitis at el., (2) revealed that length of time in the profession as older truck drivers would show a higher occurrence of low back pain due to occupational stress over the years(2). Older truck drivers who developed low back pain may have changed professions. Due to the pain and those who remained in the professional remain and sometimes end up with disability (2).

2.2.2 Social demographic factors

2.2.2.1 Obesity in relationship with low back pain among truck drivers

A study done in Helsinki, Finland(42) focusing on personal factors for low back pain revealed that overweight and obesity increased the risk for low back pain among truck drivers under the study.

According to the meta-analysis study which systematically reviewed previous studies assessed the association between overweight/obesity and low back pain. Compared with non-overweight people, overweight people had a higher prevalence of low back pain but a lower prevalence of low back pain compared with obese people.

Findings indicate that overweight and obesity increase the risk of low back pain. Overweight and obesity have the strongest association with seeking care for low back pain and chronic low back pain.

Many studies have examined the correlations between obesity and low back pain. Many have insisted that obesity might have been the cause of low back pain (14).

The meta-analyses of cross-sectional studies conducted in Finland to assess if overweight can cause low back pain among truck drivers, it showed a statistically significant association between obesity and low back pain among truck drivers (43) and it was revealed that Overweight and obesity had a stronger association with seeking care for low back pain or chronic low back pain (43).

The Researchers asserted that the association between obesity and low back pain may be causal, since they had observed it in both cross-sectional and cohort studies (43).

Possible mechanism applied to Truck Drivers can explain this association as obesity could increase the mechanical load on the spine by causing a higher compressive force or increased shear on the lumbar spine structures during various activities (43).

The existence of a possible relationship between being overweight and low back pain is reasonable, since weight increases lead to overload on the spine, which can increase the pressure on the intervertebral disc and other structures of the spine, triggering pain to the back aspect of the body(2).

According to Pope there is weak association shown between body weight and LBP (30). According to the study conducted by Andrusaitis at el (20) overweight showed no statistical relationship between the occurrence of low back pain and overweight.

In the study conducted in Korean by Min et al (38) on correction between low back pain and associated factors revealed that overweight was not a cause of low back pain among truck drivers.

Manchlkanti in his Epidermiology review of Low Back Pain (32) reported that overweight has been associated with Low Back Pain together with other chronic diseases. According to Manchlkanti several hypotheses relating to link between low Back Pain and overweight has being reported.

2.2.2.2 Age in relationship with low back pain among truck drivers

Literatures have shown that both the point and period prevalence of LBP increases with age of an individual. A systematic review on the prevalence of low back pain in Africa has shown that the mean LBP point prevalence among the adolescents was 12% and among adults was 32%. The average one year prevalence of LBP among adolescents was 33% and among adults was 50%. The average lifetime prevalence of LBP among the adolescents was 36% and among adults was 62%10. According to population study conducted in Belgian on the factors for low back pain among truck drivers Age is was one of many factors under consideration (37).

A retrospective studies conducted by reported that the incidence of low back pain increased as people aged toward their 40-60s, with the incidence of low back pain decreased gradually thereafter (44, 45, 37). According to a prospective study conducted by Troup et al.,(27) have revealed that age was not a significant factor for low back pain.

A study conducted by Min et al.(38) looking to variable associated by low back pain among truck drivers such as age, extent of obesity, smoking and level of stress were not found to affect the development of low back pain(38).

Moreover, study conducted Laxmaiah Manchikanti looking for epidemiology for low back pain age is among of contributing factors for low back pain due to the fact that intervertebral discs undergo age related degenerative changes that contribute to some of

the most common causes of impairments and disability for middle aged and older people(30).

Aging is an evolutionary and dynamic process that results in degenerative changes, not only in the intervertebral discs, but also in ligaments and bones accounting for most diseases and disorders of the aging(46).
Intervertebral discs undergo age-related degenerative changes that contribute to some of the most common causes of impairment and disability for middle-aged and older of impairment and disability for middle-aged and older(46).
The occurrence of low back pain among the general population increases with age and starts declining after 65 years of age, but its occurrence among younger individuals is not uncommon, although studies of specific populations have not shown any correlation between age and low back pain(2).

Epidemiological data is scarce on low back pain in the elderly and children Systematic review of the literature of back pain in the elderly showed the prevalence to range from 13% to 51%(46). Similarly, the studies of pain in childhood also indicate that low back pain has a relatively high prevalence during school years, variable from 12% to as high as 51%(46).
However, it has been stated that low back pain usually begins in early life, with highest frequency of symptoms occurring in the age range of 35 to 55(%)(3, 46)while sickness, absence, and symptom duration increase with increasing age(46).

2.2.2.3 Education Level in relationship with low back pain among truck drivers

2.2.2.3.1 Education Level

In the relationship between socioeconomic status and LBP, most studies concluded that low education is strongly associated with LBP (30). According to Astrand the prevalence of low back pain is high for those with low educational level (30).

In addition, it is reported that prevalence and risk of LBP is high for those with low-education, occupational status and manual workers. Latza et al. also reported that severe Recurrent back pain was related to educational level (30).

CHAPTER THREE

3.0 METHODOLOGY

This chapter presents description of study design, study area, study population, sample estimation, Inclusion and exclusion criteria, sampling procedures, data collection procedures. Study variables data management, analysis and ethical consideration.

3.1 Research Design

A research design is the framework or plans, used to guide in collecting and analyzing data (40). It is the blueprint that has to be followed in completing a study (41). Indeed, research design is like an architect's blueprint for the house through which all major parts of the research will be guided (40). With this regard, descriptive cross sectional was opted. It is a design concerned with determining the frequency with which something occurs or the relationship between two variables (40).

Descriptive study, is rigid in methodology and requires a clear statement of *who, what, when, why, and where* of the research (40). Applying a descriptive research in this study, a Cross –sectional Analysis of case study was applied. It was applied for a snap shot study prevalence of LBP problems in Dar es Salaam. Descriptive research design dealt with the frequency in which LBP problems occur and prevail. Importantly, it was used for explaining relations between variables such age, BMI and LBP.

3. 2 Study Area

The study was conducted at Pwani Hauliers Company located near Tazara in Temeke municipality, Dar es Salaam region. This is a leading big transporting company in Tanzania with 900 trucks as well as 1,000 drivers. All were males. The company is have three departments, namely; Transportation department which deals with delivery, loading and transportation of goods, Technical department deals with truck repair and service and Administration department with deals with administerial issues and logistics.

On daily basis 102 trucks leaving Dar es Salaam to Rwanda, Burundi, Malawi, DRC-Kongo and Zambia. Some of the trucks are transporting goods within the country.

3.3 Study Populations

The study population was all truck drivers at Pwani Hauliers Company in Dar es Salaam, Tanzania.

3.4 Sample Size Estimation

The following formula was used to calculate the sample size;

$$n = \frac{Z^2 p (100-p)}{\varepsilon^2}$$

Where;

z =level of confidence (1.96 for 95% confidence level)

p= Proportion of low pain among truck drivers according to systematic review on the prevalence of low back pain in Africa (10).

ε =Margin of error (5%)

From the above formula;

$$n = \frac{1.96^2 50 (100-50)}{5^2}$$

n= 384.16≈384

The figures above gave the minimum required sample size of 384; seven percent (10%) was added to carter for non-respondents, making the minimum sample size of 422.

3.5 Sampling Technique

Simple random sampling technique was used in selecting study respondents. The researcher slit down 1000 pieces of paper of which 422 pieces were numbered and the remained were not numbered (585 pieces). Truck drivers were allowed to pick only one piece of paper. For those who picked the numbered piece of paper was recruited in the study.

3.6 Data collection procedures

3.6.1 Recruitment and training of research assistants

Three Nurse Assistants and one clinical officer from Arafa Mbagala Kuu Dispensary were recruited as research assistants for the study. Selected research assistants have experience and knowledge in conducting interviews. In addition being medical practitioners they know how to check weight, height and calculating BMI. One day refresher training was done to research assistants for them to be acquainted with the research tools.

3.6.2 Pre-testing Study Tools

Data validity means the steadiness of the data being frequently giving the same outcome across time and across other viewers (Patton) [47.] In this study pre testing was done at Mainline Carries LTD which is located at Mbagala Rangi Tatu in Temeke district. The company has 150 trucks and 200 drivers. Pretesting was done to 40 truck drivers so as check how the components of the research reflect the theory, concept as well as the variable under study. It also confirms time for the questions to be completed as well as consistency of the questions. In its actuality pre testing research tools helps the researcher to modify questions after identifying the hardship of which respondents' encounters in responding to study questions.

3.6.3 Data collection Methods

3.6.3.1 Interview

Structured interviews tool comprise of set of closed ended questions in which respondents were requested to answer based on pre-determined information. By using interview guide checklist, interviewers conducted face to face interview so as to gather valid and reliable data relevant to research questions and objectives. Study respondents were found at their area of work entirely during data collection. The interview guide questions were used since drivers have no time of filling out questionnaire due to their limited time and space.

3.6.3.2 Research Instruments

Questionnaire as well as interview guide questions were the research instruments used in this study. Questionnaires were translated from English to Kiswahili Language for easy understanding among the study participants. The researcher met study participants at their workplace through appointments. Study respondents were interviewed by using a questionnaire with closed ended questions. Subjects were interviewed and the corresponding responses were entered into the questionnaire exactly what the subject have said.

3. 7 Study Variables

Dependent variable: L**ow** back pain

Independent variables: Age ,BMI, Whole body vibration, driving time, driving hours, seat, resting time, duty schedule.

3. 8 Data Management and Analysis

Data coding, checking and cleaning was done on daily basis for validation to ensure consistency before entry into computer using SPSS version 16 computer software which was also used to analyze data.

Then data were analyzed using the SPSS version 16 software computer program. The results were presented into figures, frequency tables and inferential statistics such as Pearson correlation coefficient and Pearson chi-square. Descriptive statistics were used in the interpretation of data.

3.9 Ethical considerations

Permission to carry out the study was sought from MUHAS ethical clearance committee for approval and an introductory letter from School of Public Health was obtained. Permission to perform a study was sought from the Transportation Company administration.

Consent form by the researcher was given to the study participants and their consent was sought prior to involvement in the study. Participants were informed that the

participation was voluntary and they were free to opt to participate or not and that this would never affect their relationship with the entire administration or the researcher. Participants were assured of confidentiality.

3. 10. Inclusion and exclusion criteria

3.10.1 Inclusion criteria

Truck drivers that were included in the study were:

- Employed by Pwani Haulier Company
- Who are licensed professional truck driver
- Have one (1) year and above of employment as a truck driver in the same company
- Has no history of LBP before employment as a truck driver

3. 10. 2 Exclusion criteria

Truck drivers excluded in the study were:

- With history of low back pain before he/she is employed as a truck driver.
- With history of injuries, inflammatory diseases and other self-reported chronic conditions of the spine

3.11 Study Limitations

The current study had number of limitations as the study did not categorize those factors which contribute to acute low back pain and those contributing to chronic low back pain it would be of importance, if this will be addressed in further studies because patients with acute LBP may not hold similar beliefs regarding their LBP problem and its contributing factors.

A cross survey employing a purposeful sampling method was used in the current study. Although the sample was obtained from a larger transporting company with 1000 truck drivers. The sample might not be representative enough to generalize the findings of the study to the entire population of truck drivers in studied workplace.

Furthermore, non-disclosure regarding LBP is among limitations encountered. In this regard respondent might not give the true response in fearing that he/she might be sacked out of the work.
This was tackled by giving out the aim of the study to the study participants and again ensuring that information given will be treated with utmost confidentiality and no name written in either questionnaire.

Additionally, exaggeration of pain is also a limitation. This occurs when a recruited participant amplify the information with regard to LBP, this will typically jeopardize quality of data. This kind of limitation was tackled by telling objectives of the study and its importance to their well-being as well as to the country intervention at large.

The current study was causal explanation in which it was not possible to determine the relationship between the risk factors and the outset of low back pain among truck drivers because exposure and outcomes were measured simultaneously.

CHAPTER FOUR

4.0 RESULTS

This chapter presents and interprets study findings. The study findings are presents. Demographic information of respondents, prevalence rate of low back pain among truck drivers in Dar es Salaam as well as demographic information causing low back among truck drivers in Tanzania and finally occupational factors causing low back pain in Tanzania are well presented.

4.1 Demographic Information

Demographic information of study respondents was analyzed; Table 4.1 below represented study respondents;

TABLE 4.1: Respondents Demographic Characteristics

	No	percentage
MARTITALSTATUS	N=415	%
Single	102	24.6
Married	302	72.8
Post Married Single	11	2.6
EDUCATION LEVEL		
Never attended school	10	2.4
Primary Level	253	61
Secondary Level	136	32.8
Tertiary level	16	3.9
EMPLOYMENT STATUS		
Permanent	260	62.7
Temporary	155	37.3
RESPONDENTS AGE		
≤25	36	8.7
26 – 35	189	45.5
36- 45	136	32.8
46- 55	39	9.4
>56	15	3.6

TABLE 4.2: Anthropometric Measurements

	No	percentage
RESPONDENTS BMI		
15 – 24	229	55.2
25 and above	186	44.8

As presented in Table 4.2 above, 302 (72.8%) respondents were married, 102 (24.6%) were single and 11(2.6%) were post married single individuals respectively. Majority of the respondents were standard seven leavers representing a proportion of 253 (61%), others were secondary school leavers, tertiary level as well as those who have never attended any school (32%, 3.9% and 2.4% respectively). Moreover, study findings revealed that, 260 (62.7%) were permanently employed and 155 (37.5%) were employed on part time bases.

Consideration was also given on the age of study respondents, the findings revealed that, 36 (8.7%) respondents were at the age of 15 - 25years , 189 (45.5%) respondents were at the age between 26-25 years; 136 (32.8%) were between 36-45 years, 39 (9.4%) were aged between 46-55 years, and 15(3.6%) were above 56 years.

Assessment of respondents Body Mass Index (BMI) was done on the ratio of weight and height in m2 and categorized into normal and abnormal BMI. Normal BMI represented by body weight ranging between 18-24 kg/m2 as well as abnormal body weight ranging from 25-31kg/ m2. The findings of this study revealed that, 229 (55.2%) had normal BMI and 186 (44.8) respondents had abnormal BMI (18 – 24kg/m2 and 25 – 31kg/ m2 respectively).

4.3 Prevalence of Low Back Pain among Truck Drivers

Self-reported on low back pain problems were analyzed, the response was presented in table 4.3 below;

Table 4.3: Prevalence of LBP Problem among Truck Drivers

LBP among truck drivers	No	Percent
Yes	368	88.7%
No	47	11.3%
Total	**415**	**100.0%**

As illustrated from the table above, 368 (88.7%) study respondents had LBP while 47 (11.3%) respondents reported to no LBP. The higher rate of LBP among truck drivers is an alarming public health issue especially on prevention of LBP problems among truck drivers in Tanzania.

4.3 Occupational Factors causing LBP problems among Truck Drivers in Tanzania

There are a vast number of factors that can influence LBP problems. This objective is explicitly presents occupational factors associated with LBP problems among truck drivers at Pwani Hauliers-Temeke.

4.3.1 Association between LBP and work experience

Consideration was given to work experience as among the factors that is associating with LBP. In this of respondents were asked about years of the stay with the company as well as if at all they have LBP, their findings are well presented in Table 4.4 below;

Table 4.4: Association between work experience low back pain

	Low Back Pain Currently			
	Yes	No	Total	Significance
10yrs	274(87.8%)	38(12.2%)	312(100%)	
11- 20yrs	67(91.8%)	6(8.2%)	73(100%)	X = 0.980
21 and above	27(90%)	3(10%)	30(100%)	P=0.612
Total	**368(88.7%)**	**47(11.3%)**	**415(100%)**	

From Table 4.4 above the findings revealed that 274 (87.4%) of all respondents had LBP. On the other hand 38 (12.2%) had no LBP though they had work experience ranging from 10 years.

Concurrently, cross tabulation between LBP and work experience revealed a Pearson Chi-square coefficient of 0.980 and P-value of 0.612 which was statistically not significant (Table 4.4).

4.3.2 Association between LBP and adjustable restraint with lordosis pad seat

A total of 415 respondents were interviewed on whether their car seats had Adjustable lead restraint with Lordosis pad. The findings are presented herein;-

Table 4.5 Adjustable lead restraint with lordosis

	Low Back Pain			
	Yes	No	Total	Significance
Present	254(90.7%)	26(9.3%)	280(100%)	X^2=3.565
Not Present	114(84.4%)	21(15.6%)	135(100%)	P=0.045
TOTAL	**368(88.7%)**	**47(11.3%)**	**415(100%)**	

On cross tabulation between LBP with adjustable restraint with Lordosis pad car seats it was found the Pearson Chi- square was 3.565 and P-Value of 0.045 , Since the Value is <0.05 it is worth confirming that there is positive association between LBP and adjustable lead restraints with Lordosis pad Car seats.

4.3.3 LBP and adjustable incline from horizontal low back pain

Adjustable incline from horizontal was among the factors that lead to LBP. With this respect respondents were asked to agree (if their truck seat have adjustable incline) or to disagree. The findings are presented in Table 4.6 below;

Table 4.6: Relationship between adjustable incline from horizontal low back pain

		Low back pain			
Seat type		Yes	No	Total	Significance
Adjustable seat incline from horizontal	Present	313(90.5%)	33(9.5%)	346(100%)	
	not present	55(79.7%)	14(20.3%)	69(100%)	$X^2 = 6.623$ P= 0.012
	TOTAL	**368(88.7%)**	**47(11.3%)**	**415(100%)**	

On cross tabulation between adjustable seat incline from horizontal and LBP, the findings revealed statistical significant value with a Pearson Chi-square (X2) of 6.623 and the P Value of 0.012 hence adjustable truck seat drivers' seats had positive association with LBP.

4.3.4 Association between seat appropriateness and LBP

Truck seat suitability was also considered among the factors that influences LBP among truck drivers. The analysis of this study is presented under Table 4.7 below;

Table 4.7: Association **between d**river's seat appropriateness and Low back pain

		Low back pain			
		Yes	no	total	significance
Driver's seat Suitability	agreed	282 (76.6%)	42(89.4%)	324(100%)	X^2= 3.946
	disagree	86 (23.4%)	5 (10.6%)	91(34%)	P= 0.30
	TOTAL	**368(88.7%)**	**47(11.3%)**	**415(100%)**	

Drivers' seat suitability was statistically associated with LBP as X^2=3.946 with P= 0.030. These findings entails that seat suitability was quietly responsible in enhancing LBP among truck drivers.

4.3.5 Association between LBP and Car Vibrations

Car vibration was reported to be among factors which are causing LBP. In this regard researcher opted to examine the extent to which vibration causes LBP problems. The findings are presented in Table 4.8 below;

Table 4.8: Association between car vibration v/s LBP

		Low back pain			
		Yes	no	total	significance
Exposed to	agreed	301(90.1%)	33(9.9 %)	344(100%)	X^2= 3.558
Car vibration	disagree	67(82.7%)	14(17.3%)	81(100%)	P= 0.050
	TOTAL	**368(88.7%)**	**47(11.3%)**	**415(100%)**	

On cross tabulation between car vibration and low back pain it was revealed that vibration exposure had positive association with LBP, the findings are statistically significant with the Pearson Chi-square of 3.558 and P value of 0.050.

4.3.6 Association between LBP and resting time

Consideration was also given on drivers resting time. The findings are well presented in Table 4.9 below;

Table 4.9 Relationship between LBP and Resting Time

	Low back pain			
Resting time	Yes	No	Total	Significance
30min	169(90.4%)	18(9.6%)	187(100%)	
40min	59(88.1%)	8(11.9%)	67(100%)	
40min – 1hr	74(90.2%)	8(9.8%)	82(100%)	X^2 = 5.069
1-2Hrs	34(85%)	6(15%)	40(100%)	P= 0.280
2Hrs and above	32(82.1%)	7(17.9%)	39(100%)	
Total	**368(88.67)**	**47(11.32)**	**415(100%)**	

Statistical findings revealed that there was no association between resting time and LBP as Pearson Chi-square of 5.069 and P-Value of 0.280

4.3.7 Association between LBP and employment

Employment status was also among the variables which considered having an influence among other risk factor of LBP. In this regard consideration was on permanently employed individuals as well as part-time/temporary employment. The findings are presented in Table 4.10 below;

Table 4.10: Association between employment and LBP

	Low back pain			
	Yes	No	Total	Significance
Permanent employment	229(58.1%)	31(11.9%)	260(100%)	X^2=0.248
Temporary employment	139(89.7%)	16(10.3%)	155(100%)	P = 0.372
TOTAL	**368(88.7%)**	**47(11.3%)**	**415(100%)**	

Table 4.10 above revealed that permanently employed individuals had Low Back Pain (58.1%) while 31(11.9%) respondent were permanently employed but had no low back pain. Further analysis revealed that 139(89.7%) respondents who were under temporary basis employment had low back pain compared to 16 (10.3%) who had the same status but reported to have no low back pain.

Further, on cross tabulation, the findings revealed that employment status had negative impact on LBP since Pearson Chi- square was (X^2=0.248) and P Value of 0.372. This entails that there is no statistical significance since the P value was above 0.05.

PART D: Relationship between Social demographic factors and LBP

4.4.1 Association between LBP and Marital Status

Relationship between LBP and marital status was also considered. The research was in opinion to know the association between marital status and LBP. Table 4.10 below presents the association between the two;

Table 4.11 Relation between LBP and Marital status

	Marital status				
	Single	married	post married Single	Total	Significance
Yes	88(86.2%)	269(89.1%)	9(90.9%)	367(88.4%)	
No	4(13.7%)	33(10.9%)	1(9.1%)	48(11.6%)	X^2=2.207 P = 0.698
Total	**102(24.6%)**	**302(72.8)**	**10(2.4%)**	**415(100%)**	

As presented from Table 4.11 above, 269 (89.1%) of study respondents were married and reported to have LBP other group include single as well as post married single who had LBP (86.2% and 9% respectively). Statistical findings revealed no significant value associated between marital status and LBP (X^2=2.207, P-Value= 0.698).

4.4.2 Body Mass Index (BMI) and LBP problems

The researcher wanted to know if body man index (BMI) caused LBP problems among truck drivers in Dar es Salaam. A cross tabulation was made between BMI and low back pain prevalence. BMI was categorized into BMI ranging from 11 – 17 kg/m^2 and overweight from 18 – 24 kg/m^2, furthermore the BMI were grouped into 26-32 kg/m^2 defined as overweight and 33 kg/m^2 and above defined as obesity.

Finding revealed that all respondents who had BMI ranged from 11-17 kg/m2 6(100%) had Low Back Pain. Respondents who had normal BMI which ranged from 18-24 kg/m2 184 (88.5%) had LBP while 24 (11.5%) respondents with normal BMI had no LBP. While respondents with overweight 33(91.7%) had LBP and 3(8.3%) had no LBP.

Respondents with obesity with the BMI ranged from 33+ 145(87.9%) had LBP and remained 20 (12.1%) had no LBP.

Association between BMI and LBP was sought. Finding revealed a Pearson Chi- Square value of coefficient value of 1.201 and a p value of 0.753 suggesting no significant statistical association between LBP and overweight as shown in the figure below.

4.12 Association between BMI and LBP

		LBP			
		Yes	No	Total	significance
BMI	11- 17kg/M^2	6(100%)	0(0.0%)	6(1.4%)	
	18 – 24kg/M^2	184(88.5%)	24(11.5%)	208(50.1%)	X^2=1.021
	26 – 32kg/M^2	33(91.7%)	3(8.3%)	36(8.7%)	P=0.75
	33kg/M^2 and above	45(87.9%)	20(12.1%)	165(39.8%)	
TOTAL		**368(88.7%)**	**47(11.3%)**	**415(100%)**	

4.7 Relationship between LBP and Education level

Cross tabulation on education level and low back pain prevalence was done. Majority of the respondents who were primary school leavers who said they had LBP were 223(88.1%), those who had LBP and were secondary school leavers were123 ((90.4%), tertiary level who had LBP were 14 (87.5%) and the least of respondents who said they had LBP and had not attended school were 8 (80%). Observation indicates no significant statistical association between LBP and education level(X2=1.265, P= 0.737) as p value is high than 0.05.

Table 4:13 Association between LBP and Education level

	Low back pain			
Education level	Yes	No	Total	Significance
Never attended school	8(80.0%)	2(20.0%)	10(2.4%)	
Primary level	223(88.1%)	30(11.9%)	253(60.9%)	X^2=1.265
Secondary level	123(90.4%)	13(9.6%)	136(32.8%)	P= 0.737
Tertiary level	14(87.5%)	2(12.5%)	16(3.9%)	
TOTAL	**368(88.7%)**	**47(11.3%)**	**415(100%)**	

4.4.3 Age and Low Back pain

The researcher wanted to know if age increase caused prevalence of LBP problem among truck drivers in Tanzania. Respondents who had LBP in their respective age groups were 166 (87.3%) and, aged between 26 – 35 years, between 36 – 45 year were 120 (88.2%), between 46 – 55 years were 37 (94.9%) and 56 and above were 15 (100% in this age groups). Findings revealed a Pearson Chi-Square coefficient of 5.44 and a p value of 0.2 suggesting no significant statistical difference of age and for LBP as shown in the table below:

Table 4: 14 Associations between LPB and Age

		LBP			
		Yes	**No**	**Total**	
	15 – 25	36(9.8%)	8(17%)	44(10.6%	
	26- 35	160(43.5%)	22(46.8%)	182(43.9%)	X^2 = 6.331
Age	36 - 45	102(27.7%)	14(29.8%)	116(28%)	P = 0.176
	46 – 55	55(14.9%)	3(6.4%)	58(14.0%)	
	56+above	15(4.1%)	0(0%)	15(3.6%)	
Total		**368(88.7%)**	**47(11.3%)**	**415(100%)**	

The findings under current study revealed that among truck drivers aged between 15 – 25 years 36 (9.8%) had LBP, 160(43.5%) were drivers aged between 26 – 35 years. Respondents who aged between 46 – 55 and those who are with 56 years and above were 55(14.9%), 15 (4.1%) respectively.

On cross tabulation between age and LBP found a Pearson Chi – Square of 6.331 and P Value of 0.176. This concludes that there is no statistical significance between age and LBP.

4:15 Association between LBP – Driving hours

	LBP			
	YES	**NO**	**TOTAL**	**Significance**
1 – 8hours	55(14.9%)	10(21.3%)	65(15.7%)	$X^2 = 1.265$
9 above	313(85.1%)	37(78.7%)	350(84.3%)	P = 0.719
Total	**368(88.7%)**	**47(11.3%)**	**415(100%)**	

Findings under current study revealed that 55 (14.9%) of drivers who spent 1 – 8 hours driving had LBP. While drivers who drive for 9 and above hours 313 (85.1%) had low back pain. The researcher cross – tabulated driving hours and Low Back Pain to assess statistical association between the expose and outcomes.

CHAPTER FIVE

5.0 DISCUSSION OF THE FINDINGS

This chapter presents discussion of results **prevalence and risk factors causing low back pain among truck drivers**. The discussion mainly based on research objectives and hypothesis.

5.1 Objective one: Prevalence of low back pain

The first objectives of this study sought to find out the prevalence of low back pain among truck drivers in Dar es Salaam. Several hypotheses were considered in this study .The first one was that the prevalence of low back pain would be high since, being professional drivers they spend much of their time in seated position and frequently twisting and bending their torsos. Other factors that were hypothesized to contribute to low back pain in truck drivers were BMI, Educational level, resting time, driving hours and car vibration.

From findings it was revealed that out 415 respondents 368 (88.7%) reported LBP problems and only 47 respondents (11.3%) had no low back pain problems. These finding are inconsistent with the finding by Andrusaitis at al., (2)who suggested that epidemiological studies which site life time adult prevalence rates varying between 50 – 80%. Thus 88.7% prevalence under current study seems to be higher than world ratings. However he critiques this world statistic by saying that, we may underestimate the problem suggesting that prevalence rate of low back pain depends on type and frequency of surveillance. The difference of 8.7% prevalence could be because of geographical location, environment, road infrastructure as well as the truck type. Moreover, drivers' knowledge of the causative factors of LBP could be the reason for this prevalence.

The findings of this study differ with the findings of Andrusaitis et al., (2) who find that 168 (41%) out of 410 truck drivers had no LBP problems while in this study only 47 (11.3%) had no LBP. Bahri et al.(,35) on their study of the low back pain associated with the "whole body vibrations among military Armed Vehicle Drivers in Malaysia,

concluded that out of a total of 159 respondents who participated in the study 117 (73%) reported to have low back pain. On contrary the prevalence of LBP among trucked armed vehicle drivers was higher (81.7%) compared to wheeled armored vehicle drivers (67.0%). Thus prevalence of LBP is evidently different across countries.

The World Health Organization (WHO) 2001) noted that LBP is most prevalent at the age between 35-64 years. These findings differs with another study done by Anderson et al.(3) of which the prevalent was found to be 35 – 55 years. The findings of the current study revealed high prevalence of LBP with the age ranging from 26 – 35 years (182 = 43.9%). The reported age group represents backbone work force productivity within the organization. With this regard positive intervention should be taken because treatment of LBP takes time and it can lower productivity and reduces quality of work life.

Shiri and Karppinen(44) reported that LBP is a predominant problem, according to them LBP problem are estimated to 17.2% in United States of America. The findings of this study are in consistent with Shiri and Karppinen since majority (88.7%) of truck drivers participated in this study reported to have LBP.

5.2 Objective Two: Occupation risk factors causing LBP

Prevalence and incidence of occupational LBP vary according to age, gender, type of job and methods of investigation (11). High physical and psychosocial exposures increase the risk of symptoms of LBP (7). It is considered that long working time or experience increases the risk of LBP because occupational exposure time and occupational impact have a negative effect. This is inconsistent with current study since work experience was not associated with low back pain problems (P-Value 0.612, Pearson Chi-Square 0.980). The findings of this study reveal that as work experience increases LBP decreases (27.90 %,). This could be due to the fact that respondents with greater work experience follow proper guidelines to avoid LBP problems more than those with little working experience, for example driving at night.

This study found that, truck driver’s use very long time in driving and this is among factors explaining the occurrence of LBP among drivers. Study findings revealed that

drivers spend between 8-24 hours driving a day. It is reported that prevalence of LBP in full-time workers is 25.3% compared to with 19.1% in part-time workers, and the prevalence of back pain is more than 23% among workers who worked over 36 hours weekly and more than 38% among workers who worked over 45 hours weekly(24). However, this study confirms that working many hours a day may cause LBP yet it differs from current study where truck drivers drive up to 100 hours per week. With this regard cross tabulation between working hours and LBP in this study revealed to have no association.

Car vibrations have been explained to highly cause LPB problems among Truck drivers. In this study 301 (90.1%) respondents exposed to car vibration and they had LBP. In this regard the findings under this study are statistically significant with Pearson Chi-Square 3.558 (P value <0.050).

These findings conforms the findings of Boshuizen et al.,(4)' who reported that high daily vibration exposure causes LBP. Additionally the findings of this study are also in line with Miyamoto et al., (8) who find the association between car vibration and low back pain among truck drivers. However, the findings of this study are in contrary with Palmer et al" (9) who find that car vibration had weak attribute to low back pain.

Association between car seat and LBP was also considered. Cross tabulation revealed positive association between car seat and LBP, deliberately suitability of the seat, adjustable seat incline from horizontal as well as adjustable lead restraint with lordosis pad were the seat characteristics which showed the association with LBP since P Value was higher than 0.05

These findings conforms the study conducted in Netherlands by Punnet et al., (7, 10, 28) that truck seat discomfort is associated with LBP. Miyamoto, et al., (8) also found suitability of the truck seat was significantly associated with LBP.

Furthermore, Panjabi13 suggested a proper seat which should have horizontal and vertical lumber support, since the absence of this mechanical characteristics predisposes truck drivers into both acute and chronic LBP.

5.2.3 Objective Three: Demographic factors affecting LBP problems in Dar es Salaam

Age is among the demographic factor reported to have association with LBP. This study revealed that as age increases LBP decreases, however the findings revealed no statistical association between age and LBP with the Pearson Chi-Square of 6.331 (P-Value 0.176).

These findings are in contrary with a 12 systematic study review by Burdorf et al., (24) who reported positive association between age and back disorders, however in another study their findings demonstrated no association between age and LBP among truck drivers(24).

Moreover, it is reported that associations between anthropometry (sitting and weight, Body Mass Index) and LBP are null or weak association in children (47). In adults, Pope et al. reported no associations between anthropometry and LBP (47).

However, a weak association is shown between body weight and LBP (39), and obesity (high body mass index) associated with LBP (44). The findings of this study are in line with Pope et al., (47) that there is no statistical association between BMI and LBP among truck driver.

CHAPTER SIX

6.0 SUMMARY CONCLUSION AND RECOMMENDATIONS

This chapter gives a summary, conclusion and recommendation.

6.1 Summary

The study assessed prevalence and risk factor for LBP among truck drivers in Tanzania. Its objectives and hypothesis were based on explaining factors that caused low back pain among truck drivers. Its justification and problem was based on observation of many truck drivers complaining of LBP's.

Descriptive research design was used with a cross sectional design based on a case study of Dar es Salaam region. Simple random sampling technique was used to collect data from respondents finding revealed that there is high rate of LBP prevalence among truck drivers in Dar es Salaam.

6.2 Conclusion

From the aforementioned discussion, it is seen that Dar es Salaam has a very high rate of LBP among truck drivers (88.7%). It is considered that there is the evidence that increased risk of LBP is associated car vibration, type of car seats, lifting loads
Heavy physical work, long working hours, education level, BMI, work experience resting time as well as, awkward posture, many driving hours and job dissatisfaction Besides, car vibration, truck seat suitability, adjustable lead restraint with lordosis as well as adjustable seat incline from horizontal are among the factors found under the current study to have an association with LBP.

Other factors like Heavy physical work, long working hours, education level, BMI, work experience resting time as well as, awkward posture, many driving hours and job dissatisfaction was found to have statistically not significant to be associated with LBP among truck drivers in Dar es salaam.

The factor found to cause LBP among truck driver may be directly or indirectly causal of this occupational health problem. Considerably, study findings revealed factors

which are positively associated with LBP. Notably, in this study it is also seen that prevalence and incidence of occupational LBP vary according to age, gender, type of job and methods of investigation.

High physical and psychosocial exposures increase the risk of symptoms of LBP. Furthermore, Importantly, it is well noted that LBP decreases with an increase in age it was consider that aged people tends to comply with many working regulations including precautions which are supposed compared with young people.

Also the current study revealed LBP among truck drivers decreases with an increase of years of working as truck driver

6.3 Recommendations

The burden of LBP among truck drivers in this study is significantly attributed with some occupational factors. With these findings policy makers, employers and occupational healthcare should take care of the outcomes during interventions so as to sustain or to reduce LBP.

Above and beyond the following recommendations are vital based on the study findings:-

a) **To Policy Makers**

   Although findings of this study based only on the data gathered from one truck company “Pwani Hauliers”, Temeke, Tanzania which presents few among other truck companies in the country.

   The obtained information can be used as the base for decision making plans about the type of truck seats which should be uniformly in all the trucks. Moreover, policy makers should make sure that medical examinations are conducted so as to reduce the magnitude of the problem and suitable intervention to be employed.

b) **To employers:**

This information can be used as the basis so as to plan preventive measures such as Improvement of the workplace, work task and work-organization designs, training on occupational health and safety, regular physical exercise, proper seat design and also appropriate trucks designing so that to produce little vibration

However the results under current study recommend periodic medical examination to prevent disability and reduction of quality of life among truck drivers. Also training of truck drivers on how to prevent occupational health risk factors involved in truck driving and other logistical activities.

c) **Truck drivers:**

Priority should be given in training the truck drivers on how to properly use of the adjustable seats and posture, this in turn will lower the prevalence of LBP complains among truck drivers. Importantly, it is highly recommended for the drivers to abide the regulations which are in place governing transportation.

d) **Age**

Age of the truck drivers was not statistically significant associated with LBP under the current study but still self reported low back pain was high in the age between 26-35.This is a National economic generating individuals in a country investing in Pre employment medical and periodic examination and education on how to prevent LBP should be employed by employers so that to prevent disabilities and unnecessary compensations.

e) Driving hours.

The finding under current study many driving hours was not a cause of LBP as there was no statistical significant between driving many hour and occurrence of low back pain among trucker drivers, This study found that many truck drivers drives for more than 18 hours in a day, according to International Labour Organization the standard driving hours in a day is 8 hours therefore drivers who drives for many hours than the recommended are prone for LBP and other

musculoskeletal problems. Therefore the policy should be in place to guide drivers to adhere with the policy.

f) LBP and General Population.

Low back pain is Public Health problem affecting all age group, several etiologies had been reported to cause this problem such as Poor roads, overweight, limitation of knowledge regarding lifting of Cargo.Therfore the Government should improve the infrastructure so as to smooth transportation as education on prevention of LBP.

g) Further studies.

Since the prevalence of LBP among truck drivers under current study is high (88.7%) more big studies are needed to determine the prevalence of LBP and associated risk factors especially those factors which was not examined under the current study.

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APPENDICIES

APPENDIX A: QUESTIONNAIRE (English version)

TITLE: STUDY ON THE PREVALANCE AND RISK FACTORS FOR LOW BACK PAIN AMONG TRCK DRIVERS IN DAR ES SAM

Dear participant,

I thank you for agreeing to participate in this study; you are encouraged to ask questions if you need further clarification and understanding regarding the questions in the questionnaire. Your participation to the study is completely voluntary. Your information will be treated confidentially, and will not be disclosed in any means without your prior consent. You are allowed to withdraw from the study at any time without any litigation. To ensure your privacy and anonymity **DO NOT** write your name on this questionnaire. The purpose of the questionnaire is to gather information about the prevalence of low back pain and contributing factors to your low back pain. So we need your ideas about your back pain and what contributes to your low back pain.

Therefore:-

SECTION A will enquire about your demographic and social information

SECTION B will gather information on the anthropometric measurements

SECTION C will gather information about your current low back pain situation

SECTION D is about assessment of risk factors for low back pain

SECTION A: SOCIAL-DEMOGRAPHIC DATA.

Please, put a tick wherever appropriate in the boxes provided

1. **Age (Years)** ☐

2. Marital status:

a. Single ☐

b. Married ☐

c. Post Married Single ☐

3. Education level:

a. Never attended school ☐

b. Primary Level ☐

c. Secondary level ☐

d. Tertiary level ☐

4. Employment status:

a. Permanent ☐

b. Temporary ☐

5. For how long have you being working as a truck driver?

SECTION B: ANTHROPOMETRIC MEASUREMENTS

Measurement of weight (kilogram) (Please indicate) ☐

7. Height Measurement of height (cm)

(Please indicate) ☐

Indicate Body Mass Index

(Please indicate) ☐

SECTION C: LOW BACK PAIN SITUATION

9. Do you have low back pain currently?

a. Yes **Go to question 11** ☐

b. No **Go to question 23** ☐

10. Have you ever had low back pain in the last 6 months?

a. Yes **Go to question 12** ☐

b. No **Go to question 23** ☐

11. If yes in question 9, when did your low back pain started

Before starting this job as a truck driver

b. After starting this job as a truck driver ☐

12. If yes in question 10, when did your low back pain started

a. Before starting this job as a truck driver ☐

b. After starting this job as a truck driver ☐

13. **Can you please indicate the nature of your low back pain?**

a. Intermittent [i.e. comes and goes] ☐

b. Continuous [never without back pain] ☐

14. For how long have you had low back pain problems?

a. 1 - 4 weeks ☐

b. 1 - 3 months ☐

c. 4 - 6 months ☐

d. More than 6 months ☐

SECTION D: ASSESSMENT OF THE FACTORS FOR Low Back Pain

In below table you are requested to provide information about the condition of your car's seat. **Please put a tick where you in the table below.**

15. Your car's seat has:

	Agree	Disagree
.Has an adjustable incline from horizontal,		
.Has changeable depth of seatback		
.Has adjustable height		
.Has adjustable seat bottom incline		

.Has firm (dense) foam in the seat bottom cushion		
.Has horizontally and vertically adjustable lumbar support		
.Has adjustable bilateral arm rests		
.Has adjustable head restraint with lordosis pad		
.Has seat shock absorbers		
.Has linear from- back travel of the seat		

26. According to your views

a. The driver's seat of your car is suitable (appropriate) ☐

b. The driver's seat of your car is comfortable ☐

27. How long do you drive in 24 hours

a. 1 – 8 hours of driving ☐

b. 9 and above hours of driving ☐

28. Can you please indicate your resting schedule when driving?

a. 1-5 hours of driving. ☐

b. 6 – 12 hour ☐

c. More than 12 hours of driving ☐

d. No rest at all ☐

29. Referring to question 28, how long do you rest? (Choose one)

a. half an hour ☐

b. A half to one hour ☐

c. Two to three hours ☐

d. Four to five hours ☐

e. More than five hours ☐

30. How long do you normally rest in 24 hours

a. Less than 4 hours
b. 4 – 6 hours
c. 7-8 hours
d. 9-10 hours
e. More than 10 hours

31. Compute the maximum number of hours you drive per day

32. Compute the maximum number of hours you drive per week

33. How long do you remain seated during driving per day?

34. How do you judge your posture while driving?

a. Good posture
b. Awkward posture
c. Comfortable
d. Uncomfortable

35. If Awkward posture what do you think is the cause of this posture

a. The kind of work itself
b. Seat is not in good condition
c. The nature of the road
d. The kind of car

36. Do you think you're exposed to car vibrations when driving?

a. Yes
b. No

37. **If yes can you please grade the vibrations?**

a. High frequency
b. Moderate frequency
c. Low frequency

38. Are duties scheduled in a duty roster?

a. Yes ☐

b. No ☐

39. How do you perceive your work schedule?

a. Regular ☐

b. Irregular ☐

Thank you for your cooperation. Your participation is greatly appreciated.

APPENDIX B: DODOSO (Chapisho la Kiswahili)

DODOSO No.....

HABARI ZA MTAHINIWA KUHUSUMAUMIVU YA CHINI YA MGONGO – DODOSO

Mpendwa Mtahiniwa,

Asante sana kwa kukubali kushiriki katika stadi hii.Unaombwa unaombwa kuuliza maswali iwapo utahitaji ufafanuzi zaidi kuhusu ujazaji na namuna ya kujibu maswali haya ambayo yako kwenye madodoso haya.

Kumbuka ushiriki wako katika stady hii ni wa kujitolea na pia habari utakazo toa katika dokezo hili zitakuwa siri na pia unakumbushwa kutoandika jina kwenye dodoso.Pia unaruhusiwa kujiandoka katika ushiriki iwapo unaona hutendewi haki katika zoezi hili.

Lengo madodoso haya ni kukusanya taarifa kuhusu ukubwa wa tatizo la ugonjwa wa chini ya mgongo na visababishi vyake kwa madereva wa magari makubwa ya mizigo katika mkoa wa Dar es salaam.

Wako katika ujenzi wa taifa

PHARLES J YIKOBELA(MTAFITI)

SEHEMU A maswali kuhusu taarifa binafsi za mshiriki

SEHEMU B Taarifa kuhusu vipimo vya uzito na urefu

SEHEMU C Maswali kuhusu matatizo ya chini ya mgongo.

SEHEMU D Maswali kuhusu visababisho vya maumivu ya chini ya mgongo

SEHEMU A: maswali kuhusu taarifa binafsi za mshiriki **.**

Tafadhali weka alamaya vema (v) sanduku sehemu unayofikiri ni sahihi.

1. Umri (Miaka) ☐ (Tafadhali onyesha)

2. Hali ya ndoa:

Sijaoa/olewa ☐
Nimeoa/olewa ☐
Tumeachana ☐
Tumetengana ☐
Mjane ☐
Nimeolewa bila ndoa ☐

3. Kiwango cha elimu:

Sikusoma ☐
Elimu ya msingi ☐
Sekondari ☐
Elimu zaidi ya sekondari ☐

4. Hali ya kuajiriwa:

Ajira ya kudumu ☐
Ajira ya muda mfupi ☐

5. Una muda gani tangu uanze kuendesha magari makubwa? ☐

SEHEMU B: VIPIMO VYA UREFU NA UZITO:

6. Tafadhali onyesha uzito (kg) ☐ (onyesha kwenye kisanduku hiki)

7. Onyesha urefu wako (cm) ☐ (Onyesha kwenye sanduku hili)

8. Uwiano wa uzito na urefu (BMI in kg/m2) ☐ (Onyesha kwenye sanduku)

SEHEMU C: MAELEZO KUHUSU MAUMIVU YA CHINI YA MGONGO

9. Je unasikia maumivu chini ya mgongo?

a. Ndiyo ☐

b. Hapana ☐

10. Umesha kuwa na maumivu ya chini ya mgongo katika miezi sita iliyopi?

a. Ndiyo ☐

b. Hapana ☐

11. Kama ndiyo kwenye swali la 9&10 maumivu yalianza lini?

a. kabla hujaanza kazi kama driver wa malori ☐

b. Baada ya kujaanza kazi kama driver wa malori ☐

12. Je unaelezeaje kuhusu maumivu yako ya mgongo?

a. Yanakuja na kutoka ☐

b. Maumivu yanaendelea ☐

c. Ndo mara ya kwanza kuwa na maumivu ☐

1. Una muda gani tangu uwe na matatizo ya maumivu ya chini mgongo?

a. Wiki1 hadi 4 ☐

b. Mwezi1 - 3 ☐

c. Miezi 4 - 6 ☐

d. Zaidi ya miezi sita ☐

SEHEMU D: MAELEZO KUHUSU VISABABISHI VYA MAUMIVU YA MGONGO

Katika jedwari hapo chini unaombwa kutoa maelezo kuhusu hali ya kitu cha Lori unaloendesha .Tafadhali weka vema sehemu husika .kama unakubaliana na maelezo weka vema sehemu ya kukubali na iwapo hukubaliani weka vema sehemu ambayo hukubaliani.

14.

	Agree	**Disagree**
. Kiti kinaweza kupandishwa kwa juu?		
.Sehemu ya kuegemea inaweza kubadilishwa?		
.Urefu wa kiti unaweza kuongezwa na kupunguzwa?		
.Sehemu ya kukalia inaweza kuongezwa na kupunguzwa?		
.Sehemu ya chini ya kiti ni ngumu?		
.Sehemu ya juu na upande wa kiti vyaweza kuongezeka?		
.Sehemu ya nyuma ya kuegemea ya kiti yaweza kuongezeka?		
.Sehemu ya kuweka kichwa yaweza kubadilika pamoja na sehemu ya kuegemea kiuno?		
.Kiti kinasehemu ya kupunguza uchovu?		
.Kiti kina sehemu ya kuvuta mbele na nyuma?		

15. Kiti cha gari unachoendesha ni kizuri?(Tafadhali weka vema sehemu unayochagua**)**

a. Ndiyo ☐

b. Hapana ☐

16. Kiti cha gari unaloendesha kinafaa? (Tafadhali weka vema sehemu unayochagua**)**

a. Ndiyo ☐

b. Hapana ☐

17.Unaonaje muda wako wa kupumzika kama driver wa Lori?

a. Muda wa kupumzika ni mfupi ☐

b. Muda wa kupumzika mfupi sana ☐

c. Hakuna muda wa kupumzika ☐

d. Muda wa kupumzika unatosha ☐

e. Muda wa kupumzika unatosha sana ☐

18.Elezea muda unaopumzika baada ya kuendesha kwa masaa matano mfurulizo?(chagua)

a. Chini ya dakika 30 ☐

b. Dakika 30 hadi 40 ☐

c. Dakika 40 hadi saa 1 ☐

d. Saa 1 hadi masaa 2 ☐

e. Masaa 2 na zaidi ☐

Tafadhali onyesha ya juu kabisa unayoendesha kwa siku

Tafadhali onyesha ya juu kabisa unayoendesha kwa wiki ☐

Ni kwa massa mangapi unakaa ukiwa unaendesha gari**?** ☐

Unaongeleaje kuhusu namna unavyokaa kwenye kiti wakati unaendesha Lori?

Mkao mzuri ☐

Mkao mzuri kidogo ☐

Mkao mbaya ☐

Mkao mbaya sana

Kama mkao ni mbaya unafikiri nini kinasababisha mkao kuwa mbaya?(chagua moja**)**

Kazi yenyewe

Kiti hakiko kwenye hali nzuri

Barabara

Aina ya gari

Unafikiri unakuwa katika mazingira ya kuwa kwenye mtikisiko unapokuwa unaendesha gari?(chagua moja**)**

Ndiyo

Hapana

Kama ndiyo onyesha kiasi cha mitikisiko .(chagua moja)

Mikubwa sana

Mikubwa

kawaida

Zamu huwa zinapangwa kwenye ratiba ya kazi ? (chagua moja**)**

Ndiyo

Hapana

Kama ndiyo unazionaje ratiba ya zamu zenu? (chagua moja)

Zinampangilio

Hazina Mpangilio

Asante sana kwa ushiriki wako.

APPENDIX C: ETHICAL CLEARANCE LETTER

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
DIRECTORATE OF POSTGRADUATE STUDIES
P.O. Box 65001
DAR-ES-SALAAM
TANZANIA
Telefax: 255-022-2150465
Telegrams: UNIVMED
E-MAIL dpgs@muhas.ac.tz
TEL: (255-022)-2150302-6 Ext. 207
Direct line: 2151378

Ref. No. HD/MUH/T.201/2010

16th November, 2012

Managing Director,
Pwani Hauliers Limited
P.O. Box 104869
DAR ES SALAAM.

Re: INTRODUCTION LETTER

The bearer of this letter Mr. Yikobela P. Joseph is a student at Muhimbili University of Health and Allied Sciences (MUHAS) pursuing in MPH. As part of him studies he intends to do a study titled: *"The Prevalence and risk factors for Low Back pain among truct drivers in Dar es Salaam".*

The research has been approved by the Chairman of MUHAS Research Ethical Committee.

Kindly provide him the necessary assistance for him to conduct the research.

We thank you for your cooperation.

Dr. J. R. Masalu
ACTING: DIRECTOR, POSTGRADUATE STUDIES

/emm

cc: Mr. Yikobela, P.J.
cc: Dean, School of Public Health and Social Sciences

Received
19/11/2012

APPENDIX D: INFORMED CONSENT AGREEMENT (English Version)

MUHIMBILI UNIVERSITY OF HEALTH SCIENCES, DIRECTORATE OF RESEARCH AND PUBLICATIONS.

INFORMED CONSENT

ID-NO ☐ ☐ ☐

Consent to participate in this study

Greetings! My name is ….. I am working on this research project with the objective to determine The prevalence and risk factors of low back pain among truck drivers in Dar es salaam

Purpose of the study

This study has the purpose of collecting information on the prevalence and risk factors associated with low back pain among truck drivers in Dar es salaam.

What Participation Involves

You will be asked question regarding the prevalence and risk factors of low back pain among drivers on their daily work.

Confidentiality

I assure you that all the information collected from you will be kept confidential. Only people working in this research study will have access to the information.. We will not put your name or other identifying information on the records of the information you provide.

Rights to Withdraw and Alternatives

Taking part in this study is completely your choice. If you choose not to participate in the study or if you decide to stop participating in the study you will not get any harm. You can stop participating in this study at any time, even if you have already given your consent.

Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Benefits

The information you provide will help to increase our understanding on risk factors associated with low back pain among truck drivers hence to reduce disability associated with the impact of low back pain.

In Case of Injury

We do not anticipate that any harm will occur to you as a result of participation in this study

Who to contact

If you ever have questions about this study, you should contact the study Coordinator or the Principal Investigator, Pharles J Yikobela**,** Muhimbili University of Health and Allied Sciences (MUHAS), P.O. Box 65001, Dar es Salaam (Tel. no. 0755 759073). And Dr. SIMON MAMUYA who is the supervisor of this study **and also you can contact Prof. Muhsin Aboud, a Director of Research and Publication P.O.BOX 65001 Dar es Salaam, Tel 02150302 – 6 Dar es Salaam.**

Signature

Do you agree?

Participant Agrees [__]

Participant disagree [__]

I _____ have read/understood the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of Participant _____

Signature of witness (if participant cannot read) _____

Signature of research assistant _____

Date of signed consent _____

APPENDIX G: PERMISSION LETTER

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
DIRECTORATE OF POSTGRADUATE STUDIES
P.O. Box 65001
DAR-ES-SALAAM
TANZANIA
Telefax: 255-022-2150465
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ACTING: DIRECTOR, POSTGRADUATE STUDIES

/emm

cc: Mr. Yikobela, P.J.
cc: Dean, School of Public Health and Social Sciences

Received
19/11/2012