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PREVALENCE OF CHEMICAL AND ERGONOMIC OCCUPATIONAL HAZARDS ON TRUCK DRIVERS IN RIVERS STATE

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Abstract: **This study investigated the prevalence of chemical and ergonomic occupational hazards on truck drivers in Rivers State. The cross-sectional descriptive survey research design and the is Rivers State. The population for this study comprised of all 3000 registered industrial truck drivers in Rivers State. The sample of this study was 500 truck drivers. The study adopted simple random sampling technique. Data collection for the study was collected through the use of structured questionnaires. The questionnaire was titled: 'Prevalence of Chemical and Ergonomic Occupational Hazards among Truck Drivers Questionnaire (PCEOHTDQ). A structured questionnaire was used for data collection and analysis was done using descriptive statistics such as percentage, mean and t-test. The finding of the study showed that there is no significant difference between the mean responses of drivers and the prevalence of chemical hazards among truck drivers in Rivers State [tcal (1.21); t-crit (1.96); p>0.05]; there is no significant difference between the mean responses of drivers and the prevalence of ergonomic hazards among truck drivers in Rivers State [tcal (1.46); t-crit (1.96); p>0.05]; amongst others. The study concluded that amongst the prevalence of occupational hazards includes: chemical hazards and ergonomic hazards, among truck drivers in Rivers. It was recommended that, industries and Managers should improve work policies and procedures, and provide personal protective equipment for truck drivers. Often the best solution involves a combination of approaches.**

Keywords: **Prevalence, occupational hazards, chemical hazards, truck drivers, ergonomic hazards.**

1. INTRODUCTION

Background to the Study

A good transport system is essential to support economic growth and development. Bad roads, inadequate fleets of vehicles, inadequate trains, overcrowded airplanes and congested ports are common features of developing world. Physical problems such as untrained transport managers and planners, capital restructuring and bureaucracies, ineffective traffic regulations exist. Generally, transportation is the actual physical movement of people and goods from one place to another (Mohamed & Lotfi, 2016). Several means of transportation exist for both man and goods. These means have evolved through the length of time of man's existence on the planet. Air transportation is a relatively more recent means of transportation with the invention of air travel in the last century. Prior to this time, man had transported himself and goods on land with the aid of animals, on wheels (aided by animals) and most recently automobile and trains. Water travel is as old as civilization with the invention of the ships to sail at the time of the earliest cities in hundreds of centuries BC. Trade and exchange were greatly facilitated between regions across the globe through water transportation. This did not go without its own evils such as slave trade and the problem of sea pirates. Air travel has not only aided movement of

man and goods but also importantly man's exploration to space to study the operations of the universe and aid communication. It is not to be overlooked that pipelines have equally assisted in transporting raw and finished liquid materials such as crude oil which is a major economic resource and one of the most lucrative foreign exchange earner across the globe. Road transportation has its own history. Its flexibility and ability to create accessibility to the smallest units of land uses gives a great advantage and helps in the development of local economy. In Nigeria, road transportation is the commonest and most extensively used form of transportation. It involves the use of bicycles, motorbikes, carts, cars, buses, lorries, trailers, tankers, etc., in moving people, goods and services from one location to another where they are needed using truck drivers (Mohammadzadeh, Tabibi, Sadeghi, Ayati, & Ghotbi, 2017).

Driving is a profession that is vital to the economy of every country, yet it is a career about which most people know very little. Mohan, Tiwari and Bhalla (2015) reported that surveys of the general public indicate that most people are ambivalent about truck driving and view it as a dead-end profession requiring little intelligence or skill. Nonetheless, people all over the world are dependent upon truck drivers one way or the other, and the work they perform. Manufactured goods from different parts of the world and within the country are moved to final destinations by long haul truckers.

A truck at some point and time transports nearly all goods consumed in the world. According to the American Transportation Research Institute (2004), the trucking industry hauled 68.9% of all freight transported in the United States in 2003, equaling 9.1 billion tons. The trucking industry was a $610 billion industry in the same year under review, representing 86.9% of the nation's freight bill. Trucks transport the "tangible" goods portion of the economy, which is nearly everything consumed by households and businesses. Trucking also plays a critical role in keeping costs down throughout the business community. Specifically, for businesses that produce high-value, low-weight goods, inventory-carrying costs can be considerable. Many of these producers now count on trucks to deliver products efficiently and in a timely manner so that inventory can be kept as low as possible and warehouse operating cost can be lowered.

Over the years there has been a deterioration in driving conditions, which is largely the result of traffic congestion, road and vehicle conditions, as well as the associated air and noise pollution. At the same time, there are ever-increasing pressures of adhering to a demanding schedule in circumstances that make the task of meeting deliveries almost impossible (Nævestad, Phillips & Elvebakk, 2015). In all circumstances, the driver must absorb the failures of the transport system, which results in increased stress levels, conflict with customers, and the intensification of a wide range of work pressures in a hostile traffic environment. These circumstances impact the health of drivers in a way that is becoming unacceptable as a result of occupational hazards.

An occupational hazard is a disease which are gotten due to the occupation. Some of the occupational hazards impact a driver's health negatively. An extended driving period, increases the risk for fatigue and fatal inattentiveness, the time a driver spends on the road involves other risk factors as well. Prolonged sitting, which exposes the driver to vibrations, can have a negative impact on spinal and organ health (National Transport Development Policy Committee (NTDPC). 2014). Other physical hazards include exposure to emissions, chronic fatigue, and persistent sleep deprivation.

In addition to physical threats, long-haul truck driving is also taxing psychologically, which can exacerbate existing health problems. Long-haul truck drivers are more stressed when compared with other commercial drivers. All professional drivers are expected to perform what is called "threat-avoidant vigilant activity" (NHTSA. 2011), requiring a high level of attention, the ability to process a large amount of information and stimuli from different sources, and the ability to react quickly in high-stakes situations. A momentary lapse in one's focus or a seemingly simple wrong decision can have serious, and even fatal, consequences. Oppenheim, Oron-Gilad, Parmet and Shinar (2016) cites the medical literature, and claims that threat avoidant vigilant activity is highly stressful and often results in stress induced medical problems, including heart attacks and fatigue.

Truck drivers face a variety of chemical exposures. Drivers who deliver unhardened concrete are exposed to chromium and alkaline substances, putting them at risk for both allergic skin reactions and chemical burns. Drivers of gasoline tanker trucks often experience acute headaches, dizziness, or nausea after exposure to vapors released during gasoline transfers. Diesel exhaust has been linked to lung cancer and allergic inflammation, and exposure can be substantial at loading docks and truck stops. Increasing the allowable working hours for drivers increases the risk that their exposures to hazardous substances will exceed recommended limits (Sullman, Meadows & Pajo, 2012). Ergonomic risks vary widely and can include loading and unloading heavy cargo (beverage delivery drivers handle approximately 36,000 pounds each

day), awkward postures, and working in tight spaces such as the drum of a ready-mix concrete truck. The effects of these hazards are borne out by the high number of injuries reported by drivers both in the Rivers State.

Occupational safety aims to minimize the risk to employee's health from harmful factors at work, and to prevent occupational diseases and accidents. Occupational safety denotes the principles and procedures used to prevent occupational accidents and inquires in all types of manufacturing and service industries, combining health promotion with occupational health and safety management may be more effective in maintaining or improving the working capacity of employees, and in reducing the rate of sickness, absenteeism or premature permanent work disability, than only protecting the health and safety of employees from occupational risks, (Thompson, Newman & Stevenson, 2015).

Statement of the Problem

According to Federal Road Safety Corps Thompson & Stevenson, (2014); the proliferation of unregulated commercial truck drivers operating fairly used smuggled vehicles like with fairly used tyres in roadside illegal motor parks constitutes the highest number of road traffic crashes and insecurity. Even though commercial transport operators most especially, the truck drivers have remained the main providers of transportation in Nigeria, some of these transport operators are not been regulated by the transport unions and this has constituted a big problem in the transport sector in Nigeria. In an economy where unemployment is high and where almost anybody that can drive could be a commercial truck driver especially the low income earners, retrenched and retired workers who need to continue to earn a living through steady income, commercial truck driving is now the order of the day. Therefore, this study set out to investigate the prevalence of chemical and ergonomic occupational hazards on truck drivers in Rivers State.

Aim and Objectives

The aim and objective of the study is to find out the prevalence of chemical and ergonomic occupational hazards on truck drivers in Rivers State**.** Specifically**,** the study tends to determine the following:

1. find out the prevalence of chemical hazards among truck drivers in Rivers State,
2. find out the prevalence of ergonomic hazards among truck drivers in Rivers State,

Research Questions

The following research questions were formulated to guide the study:

1. What are the prevalence of chemical hazards among truck drivers in Rivers State?
2. What are the prevalence of ergonomic hazards among truck drivers in Rivers State?

Hypotheses

The following hypotheses were formulated and tested at .05 level of significance:

H_{O1} There is no significant difference between the mean responses of drivers and the prevalence of chemical hazards among truck drivers in Rivers State.

H_{O2}: There is no significant difference between the mean responses of drivers and the prevalence of ergonomic hazards among truck drivers in Rivers State

2. CONCEPTUAL REVIEW

Occupational Health Hazard

According to ILO (1995), occupational health problems are not only problems for the worker, but above all they are problems of work and the work environment. The work environment varies greatly according to types of economic activity, occupation, company and size of workplace. Geographic and climate conditions also have a great impact on the work environment, particularly in outdoor activities such as fishing, forestry and agriculture. However, due to differences between the work environments in different countries with otherwise similar socioeconomic and climatic conditions and between different companies with similar types of production, it has been concluded that a major part (vary according to the activities and the method of estimate, (50-90%) of occupational health hazards are in principle preventable. Thus there is much room for prevention in virtually all countries and particularly in countries with lower standards of occupational health and safety. Many industrialized countries with the strongest traditions in occupational health and safety can show

constantly declining trends of occupational hazards and traditional occupational diseases as in impact of adopting the above principles. Some national and international industries have adopted a strategy setting zero risk as an objective in the work environment. Though not totally achievable such a strategy has stimulated programmes and actions for planning and designing the work environment and working practices according to the best available technology and principles and carrying out production according to good practices, operation and maintenance. This has led to substantial reduction of hazardous exposures at work, elimination or decrease in occupational hazards and diseases, and saving of costs by reduction of disturb production and cost of sickness. Such experiences demonstrate that a safe and healthy work environment can be planned, constructed, organized and maintained if the best occupational health and safety standards are applied. They also demonstrate that a healthy and safe work environment is a realistic and achievable objective, a positive investment rather than a burden for economy.

Industrial Truck Drivers

The steep rise in contributions in the field of sustainable transportation demonstrates active debate in this area (Tseng, 2013), especially related to environmental impacts and drivers' and support staff's quality of life. However, there remains scant empirical research which critically focuses on the role of truck drivers and their skills development, which are important for achieving sustainable transportation goals. The trucking industry is the backbone of transportation and logistics sector (Tseng, Yeh, Tseng, Liu & Lee, 2016) with a vital role in developing economies, especially in the Indian subcontinent, although this remains a largely unorganized sector. Most research focuses on clean energy use in transportation (Tzamalouka, Papadakaki & Chliaoutakis, 2005). In contrast, there is hardly any research which focuses on the skills of a truck driver, who has a major influence on carbon emissions.

Prevalence of Occupational Hazards

Occurrence of Chemical Hazards

Chemicals are used to make virtually every man-made product and play an important role in the everyday life of people around the world. The chemical industry is the third largest industrial sector in the world. It is also a major economic force. Worldwide, it employs some 10 million people and generates billions of euros in shareholder value and tax revenue for governments. The pharmaceutical industry has been described as dynamic and growing, in terms of sales, number of employees, and gross domestic product (GDP). It is an industry in which companies, government regulators and researchers focus on the "safety" of the products and their effects on end users and the environment.

Chemical hazards produce by chemical synthesis or manufacturing, processing, transportation and that effect on the human and environmental condition. A chemical hazard is a type of occupational hazard caused by exposure to chemicals in the workplace. Exposure to chemicals in the workplace can cause acute or long-term detrimental health effects. There are many types of hazardous chemicals, including neurotoxins, immune agents, dermatologic agents, carcinogens, reproductive toxins, systemic toxins, asthma genes, pneumoconiotic agents, and sensitizers (Wioland, 2013).

Types of Chemical Hazards

Chemical hazards are toxic, corrosive, irritant, carcinogenic, flammable, and mutagenic. According to workplace hazardous materials information, chemical hazards are classified as. (Zink & Fischer, 2013).

Class A: Compressed gas and dissolved gas or liquefied gas

Class B: Flammable gases, flammable and combustible liquids, flammable solid, flammable aerosols, reactive flammable material.

Class C: Oxidizing materials- oxidizer and organic peroxide, oxidizer: Chlorates, nitric oxide, peroxides, permanganates, perchlorates, nitrites, nitrates, and easily oxidize metal powder. Organic peroxide: Tetra hydro furan, diethyl ether, dioxane, and methyl isobutyl ether.

Class D: Poisonous and infectious materials. e.g.: Cyanides, tea salts, and asbestos.

Class E: Corrosive materials. e.g.: Inorganic acids and bases, hydrogen fluoride.

Class F: Dangerous reactive materials. e.g.: Ethylene dioxide, organic azides, Na, Li, Ca.

Pyrophosphoric materials. e.g.: White phosphorous, diethyl aluminum chloride, and lithium (Alver, Demirel & Mutlu, 2014).

Carcinogens: The identification of carcinogenic agents was based on the IARC classification and corresponding IARC monographs. Only agents belonging to Group 1 were considered, i.e., agents for which there is sufficient evidence of carcinogenicity in humans, and therefore, a causal relationship between agent and increased incidence of malignant neoplasms has been established. The estimates of the number of specific exposures of a worker were taken from the database carcinogens exposure. These estimates correspond to the exposure period 1990–1993 across 55 industrial sectors for the EU-15 countries (Anne, Wheaton, Chapman, Presley-Cantrell, Croft & Roehler, 2013).

Sensitizing and Reprotoxic Substances: The identification of sensitizing substances was based on the list of compounds published in 2013 by the German Commission for the Investigation of Health Hazards of Chemical Compounds (MAK-Commission) (Arboleda, Morrow, Crum, & Shelley, 2003). Sensitizing substances, i.e., substances capable of inducing an immunological response to an otherwise innocuous antigen, are classified either as "Sa," "Sh," or "SP." The label "Sh" designates substances that can cause allergic or irritant reactions of the skin and the mucosa close to the skin (skin sensitizing) such as irritant contact dermatitis, allergic contact dermatitis, protein contact dermatitis, and contact urticaria. The label "Sa" designates substances causing airway sensitization.

These involve allergic reactions such as bronchial asthma or rhinoconjunctivitis, and other effects associated with systemic reactions (anaphylaxis). The label "SP" designates substances causing photo contact sensitization, i.e., an allergic reaction of the skin due to the interaction of the substance with ultraviolet radiation. In general, the classification of a substance as sensitizing is based on either sufficient empirical evidence of allergenic and/or irritant effects or in cases where the allergenic effect can be considered probable on the basis of appropriate empirical evidence (Asian Institute of Transport Development (AITD). (2000).

Mutagenic According to Atombo, Wu, Zhong and Zhang (2016) of the council directive 67/548/ ECC mutagenic substances refer to substances giving rise to an enhanced occurrence of genetic mutations that may be transmitted to the offspring, i.e., permanent changes in the amount of the genetic material resulting in a change of the phenotypic characteristics of the organism and its offspring. Substances toxic to reproduction refer to substances causing either impaired fertility ("RF") or subsequent developmental effects in the progeny. Chemical exposures are generally divided into two categories: Acute and chronic. Symptoms resulting from acute exposures usually occur during or shortly after exposure to a sufficiently high concentration of a contaminant. The number of exposures for a given contaminant, the symptoms of an acute exposure may be completely different from those resulting from chronic exposure. For either chronic or acute exposure, the toxic effect may be temporary and reversible or may be permanent (disability or death). Some chemicals may cause obvious symptoms such as burning, coughing, nausea, tearing eyes, or rashes. Other chemicals may cause health.

Ergonomic Hazards

Ergonomic hazards are physical conditions that may pose risk of injury to the musculoskeletal system, such as the muscles or ligaments of the lower back, tendons or nerves of the hands/wrists, or bones surrounding the knees, resulting in a musculoskeletal disorder (MSD).

Pile driving is a construction trade that historically evolved from Carpenters work. In New England, Pile Drivers are part of the umbrella organization, the New England Council of Carpenters. Pile Drivers install piling to set the base of buildings, skyscrapers, docks, wharfs and bridges, to give a firm base to these structures. To achieve that, pile driving rigs drive metal, concrete or wood piles into the earth by various methods including vibration and impact force. The pile driving step is often the very first stage of the entire carpentry process.

The term 'Pile Driver' is used to describe both the workers and the machines that are used to drive piles into the ground. Pile driving machines are huge and look like cranes; generally these include a heavy weight placed between guides to ensure that the driver can freely slide up and down in a single line. To raise the weight of the pile through the pile driving machine, hydraulics, steam, diesel or manual labor is used. The first work related hazard for Pile Drivers was reported as early as 1866 (Bevan, Maxfield & Bultmann, 2014). The pile driving work at that time was performed by running a strong rope over a pulley. The rope was attached to the upper part of a block which was lifted and then dropped onto the pilings.

The challenge of the pile driving job, in some ways, remains in its outdoor location. The Pile Drivers face various workplace and environmental challenges like dust, mud, extreme humidity, extreme cold, wind chill, noise, etc. Musculoskeletal disorders (MSDs) in carpenters have been widely reported in the literature (Bonett, & Wright, 2014).

Heavy manual material handling (MMH), awkward postures, overhead work and kneeling are often reported as the main exposures for MSDs in the carpentry trades. These disorders occur in different body regions including the back, neck, shoulder, wrist and knees. However, very little research has been focused exclusively on Pile Drivers.

3. THEORETICAL FRAMEWORK

Theory of Reasoned Action

The theory of reasoned action was designed to explain not just health behaviour but all volitional behaviours. This theory was articulated by Fisher and Fisher (1992).This theory explains when people actually engage in disease prevention behaviours. According to this theory, one of the determinants of diseases prevention (in this study occupational hazards) is the belief of their negative impacts on human health and their severity .It premised that individuals are likely to adopt health behaviour if they perceive that ; they are susceptible to illness ;consequences of infection are severe ;and effective solutions exist. In this study it was assumed following from the above, those workers are likely to adopt one or more preventive measures if they perceive that the work environment is full of potential dangers (hazards); consequences of these hazards to the individual health are severe, and effective ways of averting such situations exists.

Empirical Studies

A survey study was conducted by Odd, Kjell and Olar (2000) in U.S.A among catering personnel working on a drilling platform at the Continental Shelf in the North sea. It was observed that twenty six respondents (65%) perceived hazards in their working environment more than others. By contrasting the extreme groups, i.e.; the high and low hazards perceivers it was found that socio demographics, e.g.; gender, marital status, age and working experience possessed no descriptive power. However, the findings revealed that the worker segment prone to perceive high hazards also reported higher degree of burn out, anxiety and depression than did the low hazards perceivers. They (the high hazards perceivers) were also less satisfied with their stay on the platform, and they reported more health problems as well. The findings indicated that hazards perceptions of hazards go beyond mere "cold cognition", also tapping into negatively feelings and emotional states.

A study conducted by Olayemi (2005) at Psychiatric Hospital, Aro-Abeokuta which was aimed at assessing and increasing the level of awareness of occupational hazards among clinical psychiatric staff in Aro-Abeokuta. The age distribution of the staff ranged from 25 years to 55years. The age range of 30-40 years had the highest frequency (30.5%). Forty males (50%) and 36 females (45%) responded to the study. The male ward I and II had the greatest number of staff with 28 members (35%). The majority of the staff have been employed from 10-15 years (67.5%). All responding psychiatry personnel (96 or 100%) were aware of occupational hazards occurring in the workplace. About 60% of the staff had attended workshops/seminars thrice while only 40% had attended once. The findings revealed that about 20 respondents (26.4%) did not have a health insurance policy while the largest percentage of the respondents (74.6%) had health insurance policy. The study further revealed that occupational hazard usually common at the patient waiting room, visiting hours, and when serving a meal especially the dinner. The respondents (72%) added that the following categories of psychiatry staff were more prone to occupational hazards: the nurses, health attendants, and psychiatrist. The findings also revealed that assaults occurred when service was denied, when a patient was involuntarily admitted, or when a health care workers attempt to set limit on eating, drinking, or tobacco or alcohol use. About 67% of the respondents indicated the above.

Fasunloro and Owotade (2004) conducted a study on perceived occupational hazards among the clinical dental staff of the Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife in Osun State. Thirty eight of the 40 staff responded, yielding a response rate of 95%. Subject ages ranged from 26 to 56 years with approximately 25% in the 31-46 years age bracket. The findings revealed that all of the staff were having good occupational hazards perception and aware of the occupational exposure to hazards. The majority had attended seminars workshops on the subject. Only five staff members (13.2%) owned a health insurance policy and 26 (68.4%) had been vaccinated against Hepatitis B infection. All dentists (24) had been vaccinated compared with only two non dentists; this relationship was significant ($p=30.07$, $x^2 =0.0000$). Fourteen members of the clinical staff (36.8%) could recall a sharp injury in the past six months, and the majority (71.1%) had regular contact with dental amalgam. Wearing protective eye goggles was the least employed cross infection control measure, while backache was the most frequently experienced hazard in 47% of the subjects. The need for Hepatitis B vaccinations for all members of the staff was emphasized, and the enforcement of strict cross infection control measures

was recommended. The physical activities and body positions that predispose workers to backaches were identified and staff education on the prevention of backaches was provided. They emphasized further that the sources of these hazards is the work environment which can include physical, chemical, biological, mechanical and social aspects. The occupational hazards found among dentists and other chemical workers were similar worldwide and included a wide range of risks and sometimes even legal hazards.

Amunega, (2002) conducted research on occupational hazards in Odo-Okun sawmill in Ilorin west local government area of Kwara state. The study revealed that few workers were exposed to various occupational health hazards at various degrees and intensity. The study revealed the occupational health hazard among saw mill workers; organic hazard 68%, physical hazard 70%, biological hazards 49% chemical hazards 64% and psychological hazards to be 78%.The t-test analysis for significance of difference between urban and rural sawmill workers in Odo Okun local government area of Kwara state with regard to their location, age, marital status and gender revealed no statistical difference in their occupational health hazard. The t-critical value required at 5% level of significance for degree of freedom of 7 (df=7) was 1.96 (t=1.44< 1.96). With the calculated t-value of 1.44, the null hypothesis was accepted. The t-test calculated from the study was less than t-test critical value and it indicated that there was no statistical difference with regard to age and gender of saw mill workers of occupational health hazards.

4. METHODOLOGY

This study employed the cross-sectional descriptive survey research design and the is Rivers State. The population for this study comprised of all 3000 registered industrial truck drivers in Rivers State. The sample of this study was 500 truck drivers. The study adopted simple random sampling technique. Data collection for the study was collected through the use of structured questionnaires. The questionnaire was titled: 'Prevalence of Chemical and Ergonomic Occupational Hazards among Truck Drivers Questionnaire (PCEOHTDQ). The structured questionnaire underwent face and content validity testing so as to ensure that the items on the instruments actually measure the constructs they were intended to measure. Data analysis for this study was done using the statistical package for social sciences (SPSS) 23.0 version. Mean and standard deviation were used to describe the set of data used for the study and to answer the research questions, while T-test was used to test the hypothesis at 0.05 alpha level of significance.

5. DATA PRESENTATION, ANALYSIS, RESULTS AND DISCUSSION OF FINDINGS

Research Question 1: What are the prevalence of chemical hazards among truck drivers in Rivers State?

Table 1: Mean and Standard Deviation on prevalence of chemical hazards among truck drivers

S/NO	Prevalence of chemical hazards	X	SD	RMK
1	Exposure to Fumes	4.23	.881	Agree
2	Exposure to Vapors	4.44	.926	Agree
3	Exposure to Particulates	4.11	.858	Agree
4	Gases	4.26	.897	Agree
5	liquids that are dangerous when ingested	4.09	.989	Agree
6	liquids that are dangerous when inhaled	4.18	.889	Agree
7	liquids that are dangerous when touched	3.97	.954	Agree
8	Exposure to Acids	4.04	1.017	Agree
9	Exposure to Pesticides	3.88	.880	Agree
	Grand Mean	**4.08**	**0.93**	**Agree**

Table 1 showed that items 1 – 10 have positive response rates. Since their weighted mean 4.23, 4.44, 4.11, 4.26, 4.09, 4.18, 3.97, 4.04, 3.88 and 3.61 are all greater than the criterion mean of 2.50, this implies that the respondents agreed to a high extent that chemical hazards affect truck drivers in Rivers State.

Research Question 2: What are the prevalence of ergonomic hazards among truck drivers in Rivers State?

Table 2: Mean and Standard Deviation on prevalence of ergonomic hazards among truck drivers

S/N	Prevalence of ergonomic hazards	X	SD	RMK
1	sitting position that is too tense due to uncomfortable and worn car seats,	4.22	.856	Agree
2	sitting position carried out for a long time without rest and body stretching	3.58	.706	Agree
3	sitting position that does not support your back properly due to a bad sitting position	4.09	.785	Agree
4	Waist pain as a result of sitting for a very long time	3.98	.719	Agree
5	Hips pain as a result of sitting for a very long time	4.17	.921	Agree
6	Butt pain as a result of sitting for a long time and an uncomfortable seat because of worn out car seats	4.11	.994	Agree
7	Left calf pain caused by stepping on the clutch pedal continuously especially when passing a jammed road, which makes the calf feel tense	4.27	.877	Agree
8	Right calf pain caused by stepping on the gas pedal continuously especially when passing a traffic jam, which makes the calf feel tense	3.93	.863	Agree
	Grand Mean	**4.02**	**0.83**	**Agree**

Table 2 showed that items 1 – 10 have positive response rates. Since their weighted mean 4.22, 3.58, 4.09, 3.98, 4.17, 4.11, 4.27, 3.93, 4.34 and 3.55 are all greater than the criterion mean of 2.50, this implies that the respondents agreed to a high extent that ergonomic hazards affect truck drivers in Rivers State.

Hypotheses

H_{O1} There is no significant difference between the mean responses of drivers and the prevalence of chemical hazards among truck drivers in Rivers State.

Table 3: t-test analysis on occurrence of chemical hazards among truck drivers.

Variables	N	$\bar{X}$	SD	α	DF	t-Cal	t-Crit	RMK
Drivers	210	4.08	0.93					
				0.05	493	1.21	1.96	No Sig
Chemical hazards	285	4.11	0.92					

Result in Table 3 revealed that t-cal (1.21) is less than t-crit (1.96) which indicates that the hypothesis stated was accepted. Therefore there is no significant difference between the mean responses of drivers and the prevalence of chemical hazards among truck drivers in Rivers State.

H_{O2} There is no significant difference between the mean responses of drivers and the prevalence of ergonomic hazards among truck drivers in Rivers State.

Table 4: t-test analysis on commonness of ergonomic hazards among truck drivers.

Variables	N	$\bar{X}$	SD	α	df	t-cal	t-tab	RMK
Drivers	210	4.02	0.82					
				0.05	493	1.46	1.96	No Sig
Ergonomic hazards	285	4.01	0.82					

Result in Table 4 revealed that t-cal (1.46) is less than t-crit (1.69) which indicates that the null hypothesis stated was accepted. Therefore there is no significant difference between the mean responses of drivers and the prevalence of ergonomic hazards among truck drivers in Rivers State.

6. DISCUSSION OF FINDINGS

The findings of the study revealed that to a high extent, chemical hazards affect the truck drivers in Rivers State. Therefore there is no significant difference between the mean responses of drivers based on their qualifications on the occurrence of chemical hazards among truck drivers in Rivers State. Findings of the study is in line with Blanco, Hanowski, Olson, Morgan, Soccolich, Wu and Guo (2011) who stated that (36.8%) of fall from height was seen in fall from some part of a truck. Although other studies have focused on falls in connection with ascending to and ascending from the cabin, no less than 43.3% of falls from some part of the truck were falls from the truck's backhatch lift. There has also been focus on accidents related to handling of goods. It has, for example, been demonstrated that truck drivers have elevated risk for overexertion (Blower, Green & Matteson, 2010). Overexertion was the second most frequent (14.2%) type of accident among truck drivers in Denmark (Shibuya et al., 2008a), followed by "caught between/under objects" (12.6%), "collision with objects" (12.0%), "slip/trip" (10.6%), and "struck by falling object" (9.0%).

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The findings of the study revealed that to a high extent, ergonomic hazards affect the truck drivers in Rivers State. Therefore there is no significant difference between the mean responses of drivers based on their qualifications on the commonness of ergonomic hazards on truck drivers in Rivers State. Findings of the study is in line with Cantor, Corsi, Grimm and Ozpolat (2010) who asserted that Truck drivers' risk of experiencing an accident in connection with ascending to and descending from the cabin has long been an area of focus in relation to driver safety. In the 1960s, when cabin steps and grab-rails were not standard on trucks, focus was placed on driver's risk of fall during ascending to and descending from the cabin (Chen, Guang, Sieber, Lincoln, Birdsey, Hitchcock, Nakata & Sweeney, 2015). Since then, most commercial vehicles have been equipped with steps and grab-rails, yet truck drivers continue to be injured in connection with ascending to or descending from the cabin, as was revealed by a recent text-mining analysis of delivery truck drivers (Chen, Guang Xiang, Fang, Guo & Hanowski, 2016). These injuries constitute considerable personal and organizational costs (Chu, 2014). Truck drivers' falls from trucks account for higher compensation claims compared with all other material handling injury claims: 60% higher in an older study and 100% higher in a newer study (Cordazzo, Scialfa & Ross, 2016). Fall from height was shown to be the most frequent (22.3%) type of accident among truck drivers recorded in the Danish work injury register, accounting for no less than 35.3% of the cases of fracture among truck drivers. The largest proportion (36.8%) of fall from height was seen in fall from some part of a truck. Although other studies have focused on falls in connection with ascending to and ascending from the cabin, no less than 43.3% of falls from some part of the truck were falls from the truck's backhatch lift. There has also been focus on accidents related to handling of goods. It has, for example, been demonstrated that truck drivers have elevated risk for overexertion (Davenne, Lericollais, Sagaspe, Taillard, Gauthier, Espie & Philip, 2012). Overexertion was the second most frequent (14.2%) type of accident among truck drivers in Denmark, followed by "caught between/under objects" (12.6%), "collision with objects" (12.0%), "slip/trip" (10.6%), and "struck by falling object" (9.0%).

7. CONCLUSION

The study showed that there is the prevalence of occupational hazards affects the truck drivers in Rivers State. Amongst the prevalence of occupational hazards includes: chemical hazards and ergonomic hazards, among truck drivers in Rivers. The hypotheses indicated that there is no significant difference between the mean responses of drivers and the prevalence of occupational hazards among truck drivers in Rivers State.

8. RECOMMENDATIONS

Base on the findings of the study, the following recommendations were made:

1. Employers and Managers should ensure all relevant safe work procedures (SWP) are in place and provide the training and information necessary for the employees to work safely and healthily, communicate with employees on the hazards involved and the precautionary measures to take if they are exposed to hazardous chemicals. Such hazard communication can be done through safety data sheets (SDS) and container labels of the chemicals.

2. Industries and Managers should improve work policies and procedures, and provide personal protective equipment for truck drivers. Often the best solution involves a combination of approaches

3. Industries should utilize engineering controls for psychosocial hazards which include workplace design to affect the amount, type, and level of personal control of work, as well as access controls and alarms, the risk of workplace violence can be reduced through physical design of the workplace or by cameras.

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