

Occupational Hazards and Risks of Automobile Mechanics in Port Harcourt Metropolis, Rivers State, Nigeria

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This study examined the occupational hazards and risks of automobile mechanics in Port Harcourt Metropolis, Rivers State Nigeria. The method of study was cross sectional survey, data collection was by means of primary and secondary sources. A total of (400) mechanics were sampled. Taro Yamane's formula was used to determine sample size. Analysis and interpretation was done using descriptive statistics and statistical package for social sciences (SPSS). From the study, about 57% of respondents had secondary education. More so, 75.4% are not aware that their job was a hazardous one. In the same vein, 73.9% were not aware that they were supposed to use personal protective equipment, but about 59.7% used one type of personnel protective equipment or the other. The health conditions reported included back pain (18%), (16%) burns, (15%) headaches and (13%) dizziness etc. Automobile mechanics need to be properly trained the use of protective equipment and encouraged to use them while working. Training could be acquired through adult literacy programmes, health education and skills acquisition programmes for the automobile mechanics. The study recommends enforcement and compliance to occupational health and safety rules by automobile mechanics so as to avoid the hazards and risks associated with their occupation.

Key-words: Occupational, Hazards, Risks, Automobile-Mechanics, Port Harcourt.

INTRODUCTION

Occupational health and safety is very essential in all works of life in order to avoid hazards and risks. The first session of International Labour Organization (ILO) and World Health Organization joint committee on occupational health safety held in 1950 as reported by, (Park, 2009) gave the following insights about occupational health and safety.

Occupational health and safety is concerned with the promotion, sustenance and preservation of the total wellbeing of the workers in all occupations. It entails the prevention of diseases associated with the work environment and prevention of the worker from unsafe work environment, ensuring that the workers are physiologically and psychologically

adapted to the work environment, in order to achieve high productivity,(USEPA,1991). Some decades ago, occupational health and safety was not considered as important in relation to work place, hence the use of industrial health problems, until early 70's when it was seen as an important factor to be recognized in the work environment such as mercantile, forestry, trades and mechanics, (Park, 2009). It is very important to note that health and safety hazards in the work place are critical, if workers are to maintain safe work environment culture and also to avoid possible outcomes that occur in course of carry out specific tasks. Occupational health illnesses takes place in a work place as a result of physical, chemical, social, biological, mechanical and psychological factors prevalent while discharging various duties at work place, (OSHA, 2008). Most occupations involve direct or indirect health and safety risks; in this regard, occupational health and safety is geared towards achieving reduction of risks to its barest minimum and equally advancing the information on health and safety in the work place (Elenwo, 2014). Occupational health and safety is associated with all aspects of health and safety in a workplace devoid of injuries and diseases, it focuses on the prevention of hazards and risk in the workplace. The health and safety of the workers have numerous determinants, in the workplace, which could lead to health risks such as accidents, injuries, musculoskeletal diseases, deafness, circulatory disease, constant irritation, headache, respiratory diseases, and lack of coordination due to stress,(WHO, 2017).

According to (Jain and Rao, 2011), occupational health and safety primarily focuses on wellbeing of all workers and persons in the workplace. An occupational hazard is something that is capable of causing harm, injury or ill-health or disease to person(s), it could be an object, material, situation or condition which when one is exposed to can cause harm. Occupational hazard is a condition existing in the workplace, or can be as a result of workers activities which are capable of causing serious accidents, injuries, diseases or property damage in a work place environment, (Jain and Rao, 2011).

The apparent insensitivity to occupational health, safety and ignorance to occupational hazards has caused some negative health impacts on artisans in Nigeria, most especially in Port Harcourt Local Government Area in Rivers State. The effect of occupational hazards and risks are on the increase

due to lack of awareness and improper education of the artisans, who are low class individual, and who do not take into cognizance the effects of their exposure to the different hazards associated with the kind of work they are engaged in (Goel, 2006). Nigeria is a developing country that places little importance on occupational health and safety incidents. As a result of this, some of the automobile mechanics are not fully aware of the effects of the work environment and the type of substances used on their jobs and their implications to their health. Hence, there is need to examine the effect of hazard and risks associated with automobile mechanics in the study area. The essence is to elicit the inherent danger associated with their jobs and to educate them on the best and safe way to use or handle their tools and other equipment including chemicals to prevent adverse health effects which could lead to death or extreme health conditions. Automobile mechanic services add to the State and national economic activity and indeed add to the Gross Domestic Product (GDP) and as well provides livelihood to the families of those engaged in such jobs. In United States, 3.9 out of every 100 full-time workers employed in the automobile repair and maintenance sector in 2011 suffered some type of non-fatal occupational hazards or accidents according to data from (UNSBLS, 2015). Hence to educate and train them on occupational health and safety courses designed according to their job profile is of utmost importance. If they are affected by these health hazards whether biological, chemical, mechanical, physical and psychological, inadvertently, it affects both their immediate and extended families. Workers predisposed to Polycyclic Aromatic Hydrocarbons (PAH) are at increased risk for lung, urinary tract, brain and skin cancer (Boffetta et al., 2007).

These and other ailments are faced daily by these artisans or the automobile mechanics in the course of their daily activities. Therefore, this research examined the occupational hazards and risks among automobile mechanics in Port Harcourt Metropolis, Rivers State, Nigeria.

Research Questions

1. What are the types of occupational, hazards and risks that automobile mechanics are exposed to in Port Harcourt Metropolis?
2. What is the level of awareness of

hazards and risks amongst automobile mechanics in the study area?

3. What are the types of illness, injuries and other occupational, hazards and risks associated with automobile mechanics?

4. What are the levels of compliance to occupational health and safety laws amongst automobile mechanics in the study area?

5. What measures are to put in place to improve the working conditions of automobile mechanics in the study area?

Aim and Objectives of the study

The aim of this study was to examine the occupational, hazards and risks of automobile mechanics in Port Harcourt Metropolis.

To achieve the aim, the specific objectives were to:

1. Identify the types of occupational hazards and risks that automobile mechanics are exposed to in the study area

2. Assess the level of awareness of automobile mechanics of the occupational hazards and risks that are peculiar to their job.

3. Determine the types of injuries, illness and other occupational hazards that the automobile mechanics are prone to in the study area.

4. Ascertain the level of compliance of automobile mechanics to occupational health, safety rules and regulations as stipulated by the occupational health and safety laws of Nigeria.

5. Suggest ways by which automobile mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries.

Significance of Study

Roadside mechanics or artisans are ignorant of the health and safety hazards they are exposed to while working. For instance, unsafe practices like sucking of fuel with the mouth, using bare hands to loose bolts and spray-painting without goggles to protect the eyes, tightening of bolts without hand gloves etc., are a few of the occupational hazards and risks they are exposed to on a daily basis. Therefore, this study elicited the dangers inherent in their activities and gave suggestion to reduce such hazards and risks, injuries or loss of life and permanent

disabilities on these automobile mechanics.

METHOD OF STUDY

Scope of Study

This study focused on automobile mechanics in Port Harcourt Metropolis, Rivers State. For the purpose of this research work, the map of the study area Port Harcourt Metropolis has been delineated into 13 zones (Figure 1). These zones are Rumukwurushi (Zone 1), Rumuodara (Zone 2), Elekahia (Zone 3), Eligbolo (Zone 4), Bori Camp (Zone 5), Bodo (Zone 6), Orogbum (Zone 7), Golf Course (Zone 8), Mgbuoba (Zone 9), Rumuepirikom (Zone 10), Mgbuosimiri (Zone 11), Amatagwolo (Zone 12), and Port Harcourt township area (Zone13).

Study Area: Location and Extend

Geographical Location

Port Harcourt metropolis is located between Latitude 4°45'N and Latitude 4°55'N, and Longitude 6°55'E and Longitude 7°05'E in Rivers State. It is a city in the Niger Delta region of Nigeria. The city lies at the mouth of River Bonny in Rivers State. It is located at about 25 km from the Atlantic Ocean and is situated between the Dockyard creek/Bonny River and the Amadi creek. It lies at an average altitude of about 12 m above mean sea level. Port Harcourt metropolis is presently composed of two Local Government Areas, which are Port Harcourt and Obio / Akpor Local Government Areas (LGA) respectively. The city is bounded to the north by Oyigbo and Etche LGAs, to the south by Okrika LGA, to the east by Okrika and Eleme LGAs, and to the west by Emohua LGA (See Figure 2, showing the communities in Port Harcourt Metropolis, Rivers State).

Climate

Climatically, Port Harcourt experiences a tropical monsoon climate and humidity with lengthy and heavy rainy seasons and very short dry season. Only the months of December and January truly qualifies as dry season. The harmattan which climatically influences many cities in West Africa is less pronounced in Eleme. Heaviest precipitation

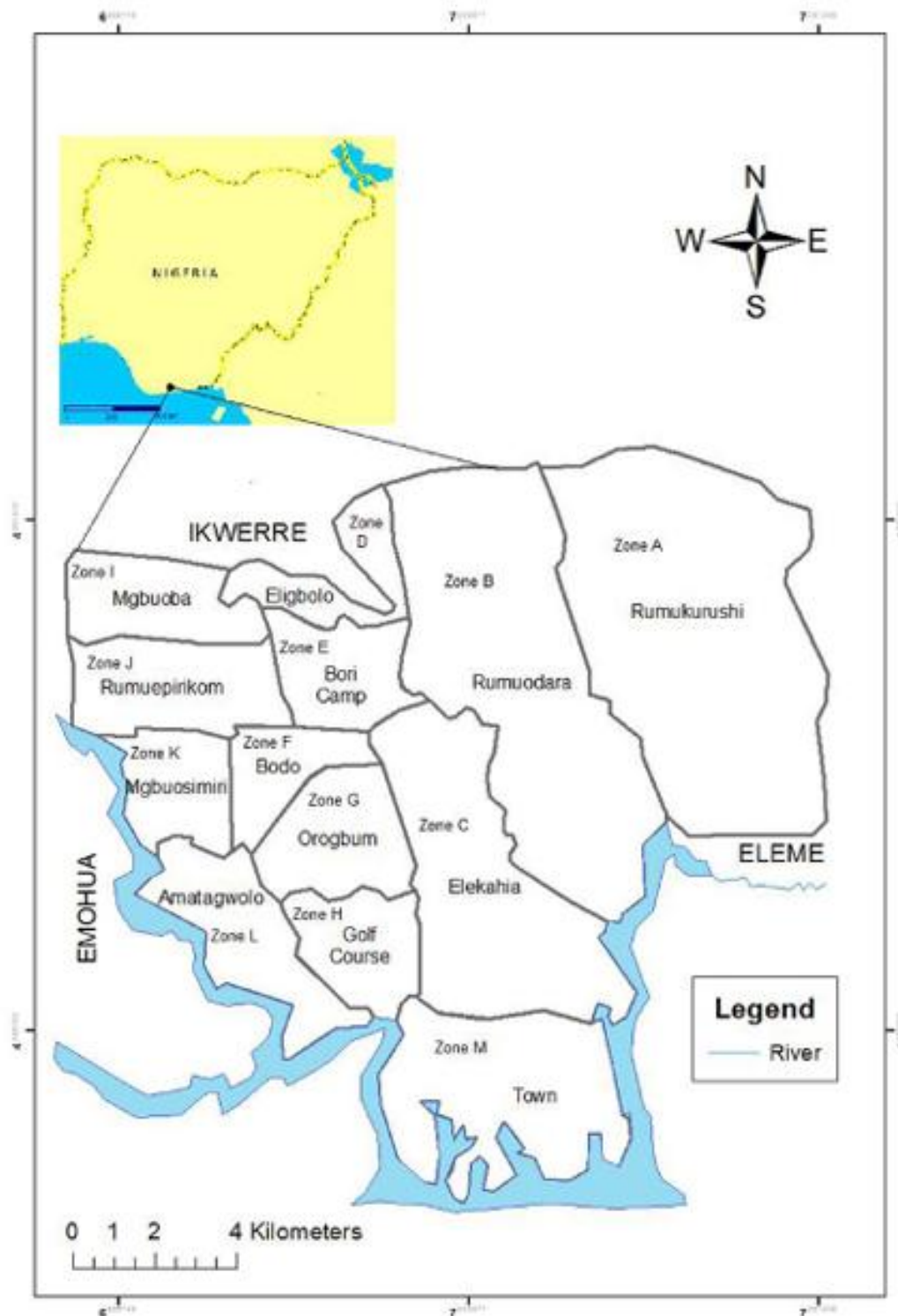


Figure 1. Showing the 13 zones delineated for the study.

occurs during September with an average of 370mm of rain. December on average is the driest month of

the year, with an average rainfall of 20mm. average temperatures throughout the year is relatively

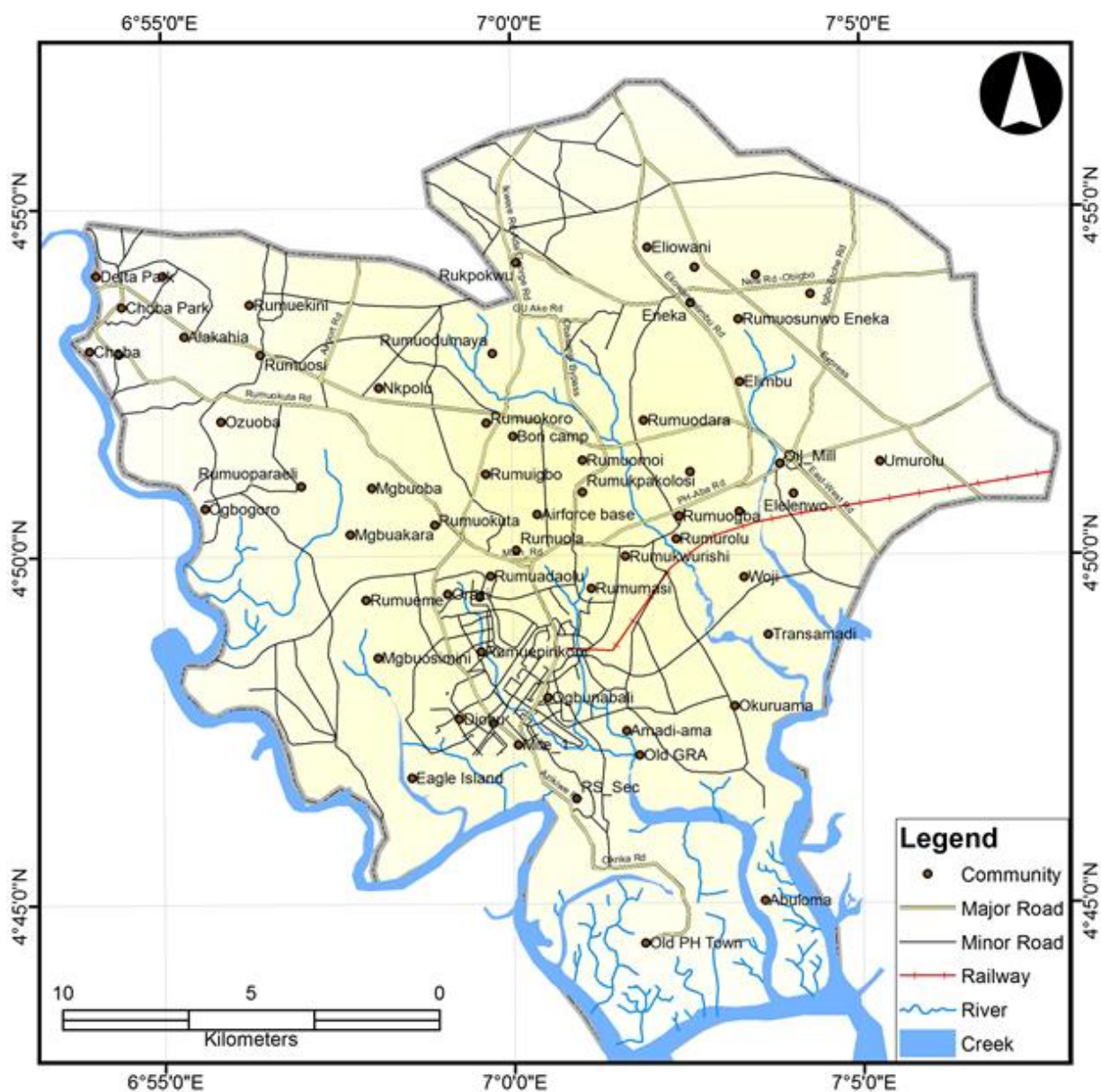


Figure 2. Showing the communities in Port Harcourt Metropolis, Rivers State.

constant, showing little variations throughout the course of the year. Average temperatures are typically between 25°C - 28°C in the city.

Population

Port Harcourt is influenced by urbanization or urban sprawl which is largely due to the expansion of the oil, manufacturing and allied industries. The 2006 Census placed its population at 1,382,592; this

rapid growth in population is attributed to the high influx of people into the city on daily basis (NBSFRNP, 2006).

Industrial Activities

With the discovery of oil in the Niger Delta in the 1958, Port Harcourt is home to oil, manufacturing and allied industries increasing the role of a more industrial economy. Port Harcourt Metropolis is

heavily concentrated with divers industries.

Geology and Drainage

The surface geology consists of fluvial sediments. This includes the recent sediments transported by river Niger distributaries and other rivers, such as Adoni, Bonny and New Calabar. There materials deposits as regolith overburden of 30m thickness are clays, silts, sands and gravels. Drainage is poor, being low lying with much surface water and high rainfall of between 3,420mm and 7,300mm. Thus, almost all riverine LGAs are under water at one time of the year or another. The area is drained by the Bonny New Calabar river systems and by a maze of effluent creeks and streams. River bank levees are prominent and valley side slopes are very gently and experience a great deal of erosion and accretion. All the rivers enter into the sea through wide estuaries.

Vegetation

The prevailing natural vegetation is the rainforest. Fresh water swamp Mangrove swamp exists in some cases. The study area is rich in Economic tress such as Oil Palm, Raffia tress, Iroko, Mahogany and Obeche tress. These expansive forest areas have been deforested by many industries and many other servicing companies. Other deforestations agents include construction of modern roads these has greatly affected the natural environment.

Research Design and Sampling Techniques

This study was a cross sectional survey research which involved the use of questionnaire. The simple random sampling technique was adopted to select respondents from the study area. The thirteen mechanic zones in Port Harcourt Metropolis were listed. A total of 400 copies of questionnaire were randomly distributed. At the end of the questionnaire administration, only 342 questionnaires were properly filled with the right answers, while about 58 questionnaires was not properly filled and some not returned, this represented about 14.5 % response rate.

Sources of Data

The data for this study was obtained from two main

sources which were; primary and secondary data sources. The primary source comprised of data collection from field observations. The secondary sources involved the use of information from previous works done on the area of study.

Population Sampling

The research population included all the mechanics in Port Harcourt Metropolis in Rivers State. Port Harcourt was delineated into thirteen (13) zones with about 1,070 listed mechanic workshops. Taro Yamane formula was applied to obtain sample size, of 400. About 342 questionnaires were retrieved at the end of the exercise. Random sampling technique was used in the selection of mechanic workshops in the zones where questionnaires were administered. Applying (Yamane, 1964) formula to obtain the sample size for the study is shown thus;

$$n = \frac{N}{1 + N(e)^2}$$

n = the sample size N = the population size

e = the acceptable sampling error = 0.05

$$n = \frac{1070}{1 + 1070(0.05)^2} = 400$$

Data collection and Instrumentation

A well-structured, close-ended questionnaire was designed to obtain information on the socio-demographic status, bio-data, assessment of knowledge, effects and prevention of hazards and workplace environmental hygiene conditions. Administration of questionnaires was done on each of the sampled persons as shown in Table 1. Health problems and hazards were assessed by on the spot simple health fitness check on the automobile mechanics at each zone sampled. A total of (20) twenty research assistants (15, field officers) and (5 health personnel) were engaged. The exercise lasted for five months; it was a one year project. Also visual observations to evaluate workers behaviour; general maintenance and chemical handling, attitude to spills or residues, compliance and use of personal protective equipment like hand gloves, nose masks, eye goggles, etc. and coverall, workshop conditions during performance of routine maintenance and repairs on cars were assessed, (Garg and Dubey, 2015).

Analysis and interpretation of data was done using

Table 1. The number of mechanic workshops in each zone.

Zones in Port Harcourt Metropolis	Number of Mechanic Workshops	Number of Persons Sampled
Rumukwurushi Area	30	20
Rumuodara Area	32	28
Elekahia workshops	680	190
Eligbol/Eliozu Area	50	24
Bori Camp Area	30	20
Bodo	30	15
Orogbum/Ogbunabali Area	31	20
Golf Course Area	32	10
Mgbogba(NTA Road)	50	21
Rumuepirikom	33	10
Mgbuosimiri(Agip Area)	31	16
Amatagwolo Area	31	10
Town(Port-Harcourt Township)	30	16
Total	1,070	400

Table 2. Age of Respondents.

Age [Years]	Frequency	Percentage[%]
<11	6	1.8
11-20	37	10.8
21-30	144	42.1
31-40	129	37.7
>40	26	7.6
Total	342	100

Table 3. Tribe of Respondents.

Tribe	Frequency	Percentage[%]
Yoruba	116	33.9
Igbo	81	23.7
Hausa	27	7.9
Others	118	34.5
Total	342	100

descriptive statistics and relevant statistical tools such as simple percentages, frequency charts, means and standard deviation at 0.005 level of significance.

RESULTS

A total of 342 out of the 400 copies of questionnaire were retrieved giving a response rate of 85.5%.

Personal Characteristics of Respondents

Table 2, shows the age categories of respondents; about 42.1% were between 21-30 years, 37.7% were between 31-40 years and 7.6% were more than 40 years respectively.

Table 3, shows that 33.9% were Yorubas, 23.6% were Igbos, and 34.5% were from other tribes in Nigeria.

Also Table 4 shows that 11.9% of the mechanics had no education, while 57.0% has secondary education. Others are shown in the table.

Table 5, shows that 75.4% of the mechanics were not aware of occupational hazard of their jobs.

Table 6, shows that 73.9% were not aware of use of Personal Protective Equipment on the job while, 26.0 % say they are aware and use Personal Protective Equipment for their job.

Table 7 displays all the personal protective equipment that were used by automobile mechanics. This table explains the level of non-compliance and ignorance about occupational

Table 4. Educational Attainment of Respondents.

Education	Frequency	Percentage[%]
None	41	12.0
Primary	98	28.7
Secondary	195	57.0
Tertiary	8	2.3
Total	342	100

Table 5. Awareness of Occupational Hazards.

Awareness of Occupational Hazards	Frequency	Percentage[%]
No	258	75.4
Yes	84	24.5
Total	342	100

Table 6. Awareness of Use of Protective Equipment.

Awareness of Personal Protective Equipment	Frequency	Percentage[%]
No	253	74.0
Yes	89	26.0
Total	342	100

hazard and safety exhibited by the automobile mechanics in the study area.

The number of working hours attests to the higher risk and hazard exposure of the automobile mechanics and makes them susceptible to occupational health problems (injuries, ailments and diseases etc.) as shown in Table 8.

The health personnel in the team carried out blood pressure and urinalysis test, in-situ on the automobile mechanics at the different sample area as shown in Table 9.

Table 10, shows that only 11.1% of the automobile mechanics had attended occupational health and safety seminars and workshop.

The Figure 3 elicits the automobile mechanics knowledge and use of health and Safety equipment such as fire extinguishers. About 35.9% have and use fire extinguisher. About 20.2% had and used first aid box to treat minor injuries. About, 51.3% had aids, used for instrumentation.

A summary of the different types of hazards that the automobile mechanics are shown in Figure 4. About 43% affirmed they were exposed to chemical hazards, 33% were exposed to mechanical hazards and others as shown in the chart.

The Figure 5 explains the health effects resulting from hazard and risk exposures by automobile mechanics. About 18% had back pains, 16% had fatigue, 16% had burns, 15% had headache, 13% had dizziness, 8% had injuries from fall, 6% had hearing problems, 4% had tetanus and 4% had respiratory problems. This analysis also affirms the type of injuries, ailment and diseases suffered by automobile mechanics.

DISCUSSION

The study revealed that automobile mechanics were mainly young adults with 42.1% of them in the age range of 21-30 years, 37.7% were from age range of 31-40 years. This represents the active age group with males making up a huge percentage of (98.4%) of the population. This can be attributed to the strenuous activity and hazards associated with the occupation. Furthermore, a study carried out by (Sambo et al., 2014), revealed that majority of the mechanics (41%) were from the Yoruba tribe, this corroborates the finding in this study with about 33.9% from same Yoruba tribe. Automobile mechanics are individuals from the low socioeconomic background and this could be evidenced by their educational background as shown in this study. Thus, 57% of the automobile mechanics had only secondary level of education and only 2.3% were degree holders at time of this study. Majority about, (75.4%) of the automobile mechanics did not know about occupational hazard and risks inherent in their jobs. Also, it was discovered that about (26.3%) of the automobile mechanics interviewed had worked for less than 10 years.

This study also revealed that (65.8%) of the automobile mechanics work between 6-10 hours every day. The long exposure period makes them more vulnerable to the illnesses attributed to their job. This agrees with a study by (Sambo et al., 2014) in Zaria where 71.5% of the automobile mechanics worked between 6-11 hours daily. On the hazards affecting the automobile mechanics in this study, it was observed that chemical hazard

Table 7. Types of Personal Protective Equipment used by Automobile Mechanics.

Types of Personal Protective Equipment	Frequency	Percentage[%]
None	130	38.0
Hand Gloves Alone	40	11.7
Hand Gloves and Eye goggles	10	2.9
Hand Gloves and Coverall	5	1.5
Hand Gloves and Boots	20	5.8
Hand Gloves and Face Mask	2	0.6
Face Mask Alone	1	0.3
Eye Goggles	15	4.4
Eye Goggles and Overall	4	1.2
Overall Alone	60	17.5
Invalid	21	16.1
Total	342	100

Table 8. Daily working hours of Automobile Mechanics.

Working Hours Per Day	Frequency	Percentage[%]
< 1	3	0.9
1 -5	90	26.3
6 -10	225	65.8
> 10	22	6.4
Invalid	2	0.6
Total	342	100

Table 9. Health Records of Respondent.

Regular Check Up	Frequency	Percentage[%]
Yes	32	9.3
No	310	90.6
Total	342	100

Table 10. Access to occupational health and safety workshop/seminar.

Seminars and Workshop	Frequency	Percentage[%]
Yes	38	11.1
No	304	88.9
Total	342	100

constituted the most common hazard (43%) and physical hazard had the least score with 7% .Some of the chemicals included; paints, thinners, rust removers, gasoline, cleansers (Cunningham et al.,

2005). On the issue of most prevalent ailment, this study shows that back pain was the most common ailment, about (18%). This attests to the lack of use of mechanical aid, which reduces dissipation of

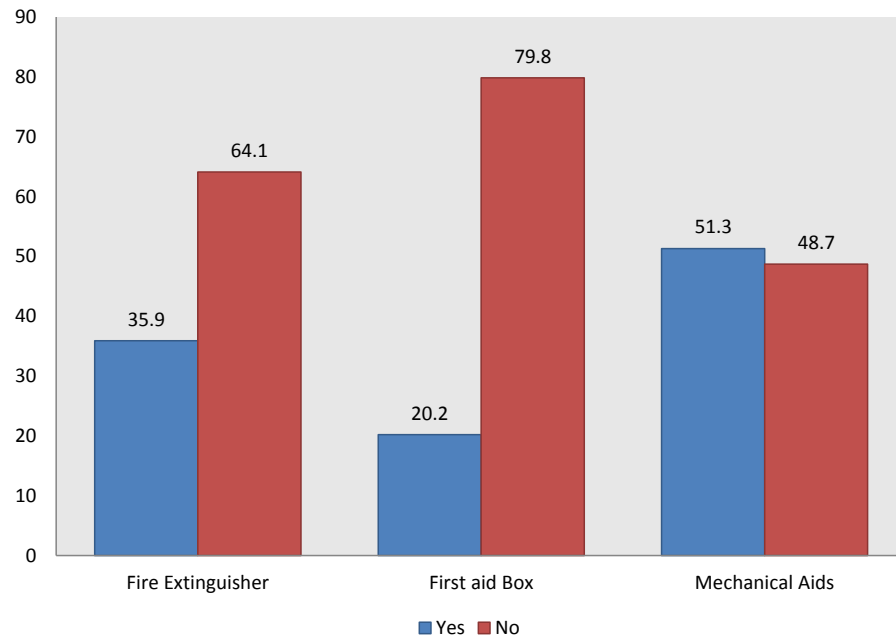


Figure 3. Use of Health and Safety equipment e.g., Fire Extinguisher.

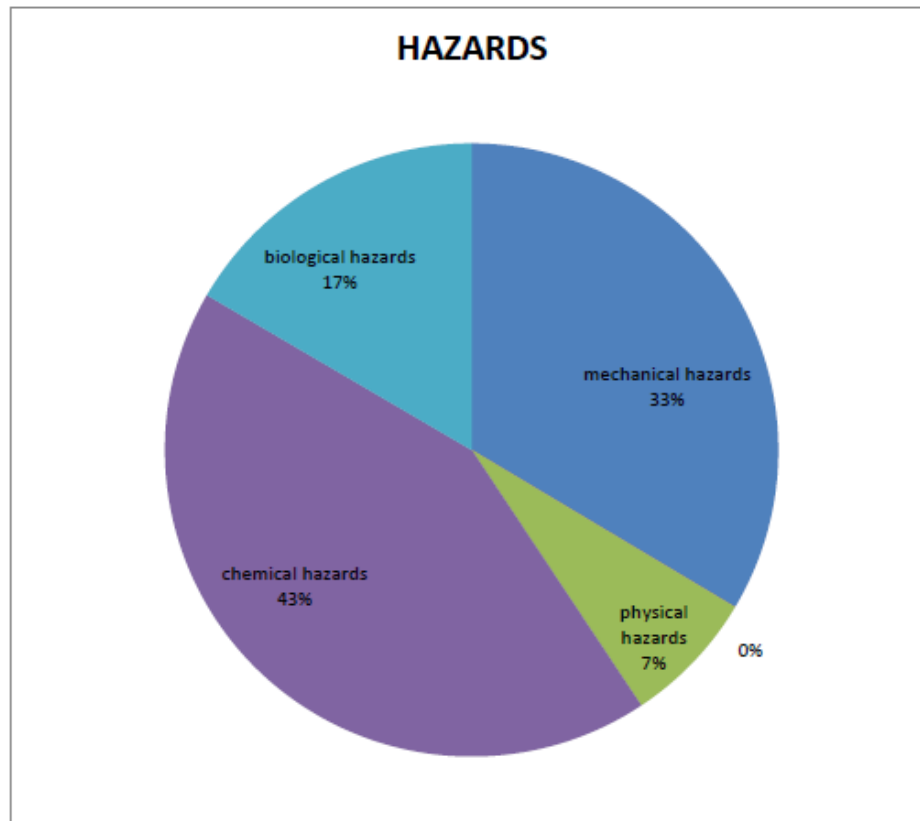


Figure 4. Types of Hazards and Risks Exposed by Automobile Mechanics.

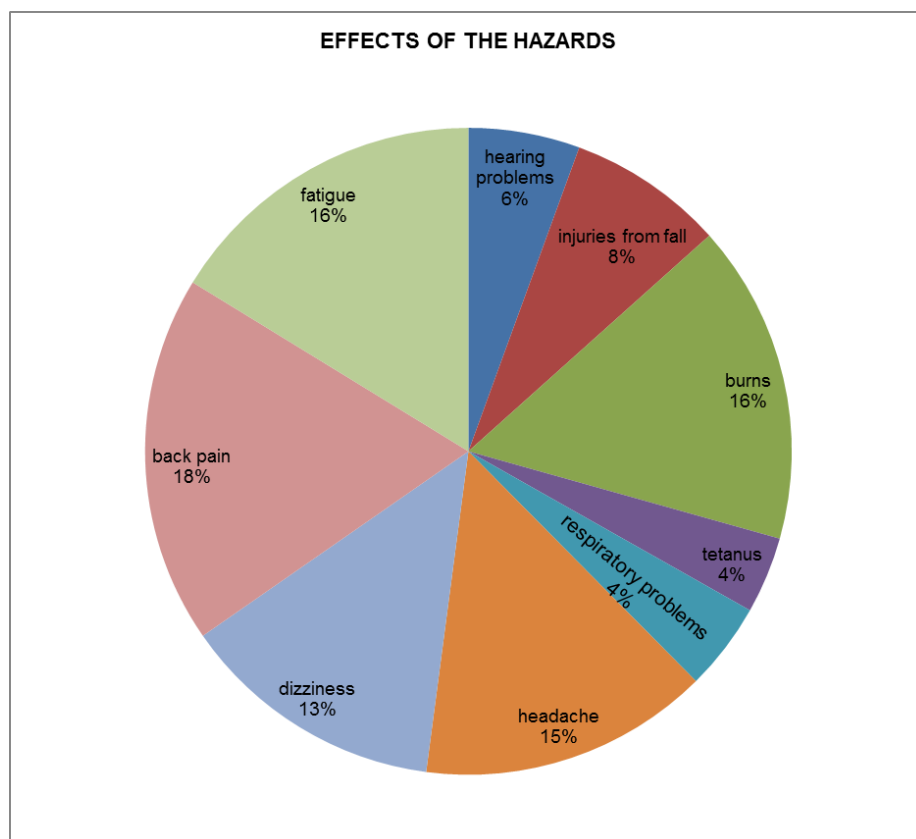


Figure 5. Health effects resulting from exposures to hazards (Injuries, ailments suffered)

energy. They rarely use mechanical aids to assist in lifting heavy objects. This assertion is in line with the findings of (Omokhodion, 2009) on the study of automobile mechanic in Ibadan city, Nigeria. More so, about (73.9%) of the automobile mechanics were not aware of use of personal protective equipment. The most utilized personal protective equipment was hand gloves (14.0%) while (40.3 %) did not use any protective equipment. The possible consequences of lack of use of the different PPE, especially gloves would result to serious injuries, such as serious cut on the fingers or fracture in the case of bolt tightening or loosening, severe burns in case of chemicals handling, and physical contact with germs in case of dirty objects been held etc.

CONCLUSION

The study has shown the different crude ways by

which automobile mechanics carry out their jobs and the dangers inherent as a result of non-compliance to basic occupational safety rules. It is therefore pertinent; to note that those working with chemical substances and around hazardous areas should think Safety first and should be protected from harm by the use of personal protective equipment (PAH/WHO, 2004). From this study it is very germane that the automobile mechanics need to be indoctrinated on how to use protective equipment while working and also to comply with occupational health and safety rules. Furthermore, there is need for a formal training for these groups of persons in the state and the nation at large. This training could be acquired through adult literacy programmes workshops on health safety education and also an aggressive public enlightenment campaign on adequate safety practices by automobile mechanics. The training shall cover safe handling of all equipment, use of mechanical aids to assist in lifting

of heavy loads, and use of a respirator etc. The occupational health and safety administration requires by law that employees establish and implement a written respiratory protection programme to help eliminate harmful substance in the air (Disaster Preparedness- MPA-004, 2004). Automobile mechanic workshops should be well ventilated and should maintain good sanitation habit around the workplace. This study suggests adequate public enlightenment through the social media, electronic and other means by which the automobile mechanics can be reached with emphasis safe on work practices and use of personal protective equipment, compliance to occupational health and safety rules to avoid loss of lives, injuries and other hazards and risks associated with the occupation of automobile mechanics.

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