

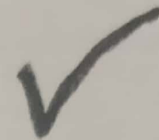
## OCCUPATIONAL HEALTH HAZARDS AMONG ROADSIDE AUTOMOBILE MECHANICS IN MINNA METROPOLIS, NIGER STATE, NIGERIA

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### Abstract

The purpose of the study was to identify the occupational health hazards among roadside automobile mechanics in Minna metropolis. Three research questions and one hypothesis guided the study. The design used was a survey research design. Simple random sampling technique was used to select a sample for the study which composed of 120 roadside mechanics from engine repair shops and 80 roadside mechanics from body repair shops from a total of twenty (20) roadside automobile workshops in Minna. The instrument for data collection was a structured questionnaire on occupational health hazards. Data obtained were analyzed using mean, standard deviation and t-test. The result obtained reveal that auto mechanics are exposed to wide range of hazards, such as: physical, chemical, and human factor. The study also revealed that human and environmental factors as the main causes of occupational health hazards among roadside automobile mechanics in Minna. It was therefore recommended among others, that government at various level should pay more attention to the occupational health safety of roadside automobile mechanics by enforcing the occupational health safety rules and regulations.

### Introduction

Any practice or situation that occurs in an occupational settings and has the potential to cause bodily or mental harm or pose any other risk to the health of one or more workers constitute as workplace hazards. According to Forest (2014), Different occupation pose different types of potential hazards to the employees. Occupational deaths, injuries and work related diseases take a heavy toll in developing country as Nigeria where occupational health issues receive less priority.

Although occupational safety and health is a very important issue at individual, social and national levels, it has not received much or any attention at all. According to Azaroff, Levenstein and Wegman (2002), Poor Occupational Health and Safety (OHS) standards are feature of small scale enterprise. And in developing countries as Nigeria, Automobile Mechanics belongs to the informal sector where high number of Occupational Health Hazards are recorded. This assertion was supported by Oyelarin (1997) in his study of small scale industries of Nnewi and Akinbinu (2001) who studied the informal Small Scale Enterprise cluster in auto mechanic village in Ibadan. Motor vehicle maintenance and repair is, by its nature, a hazardous occupation. Those working in the sector are in daily contact with chemicals and flammable materials, electrical devices, heavy lifting equipment and moving vehicles. Slips and falls (for example into an inspection pit) are common risks. There is also a real risk of potentially fatal accident from working beneath incorrectly or inadequately secured vehicles. Safe working practices are therefore essential. Akple, Turkson, Biscoff and Nayanuame (2013), also supported the assertion that the repairs and maintenance of motor vehicles is considered one of the occupation with high potential health risks. This is because the workers are exposed to various accidents related factors such as load lifting, improper work postures, the use of hazardous chemicals etc, which could easily results into accidents if workers fail to adhere to workshop safety regulations. Peterson (2014), also noted that automobile mechanics are exposed to variety of hazards in the work shop: slip and falls, accidents caused by spilled motor oil, cuts and bruises from mishandling tools and also exposure to asbestos from replacement of car parts. Working under vehicles, using heavy machinery and power tools, plus being on their feet all day and straining their backs and muscles; mechanics face a number of occupational hazards on daily basis. But there is more to their job than just the ordinary physical risk. Bristow (2012), in her work on workshop hazard stressed that auto mechanics are exposed to wide range of chemicals that include heavy metals such as the ones contained in brake fluids, detergents, lubricants, degreasers, paints, metal cleaners, solvents and fluids. Contact exposure to these will lead to chronic poisoning. A report from the International Labor Organization (1999) shows that hundreds of thousands of accidents cases were recorded in workshops including automobile workshops of which the accidents resulted in deaths. Therefore, there is need for health and safety education of these workers for health and increased productivity. Sabitu, Iliyasu and

Dauda (2009), in their work on occupational hazards in Kaduna recommended that adherence to safety rules and regulations can reduce occupational hazards within the automobile repair shop is very important.

### Research Questions

1. What are the occupational health hazards among roadside automobile mechanics in Minna metropolis?
2. What are the causes of occupational health hazards among roadside automobile mechanics in Minna metropolis?
3. What are the preventive measures of occupational health hazards among roadside automobile mechanics in Minna metropolis?

### Research Hypotheses

H<sub>0</sub>: There is significant difference in the mean responses of Automobile Mechanics in the engine repair shops and Automobile Mechanics in the body repair shops on the occupational health hazards in roadside Automobile workshop.

### Methodology

The research design used for this study was the survey research design. Olaitan and Owoke (1999), defined survey research design as one in which a group of people or item is studied by collecting and analysing data from people or items considered to be representative of the entire group. The study was carried out in Minna metropolis, embracing some parts of Chanchaga and Bosso local government, Niger State, Nigeria. The population of the study consist of 120 road side automobile mechanics from engine repair shops and 80 roadside mechanics from body repair shop (panel beaters) from 20 roadside auto-mechanic workshops in Minna metropolis. A sample size of 200 respondents (from road automobile workshops) were selected randomly in Minna metropolis. A well-structured questionnaire designed on 4 points rating scale was used to collect data for the study, items with mean response 2.5 and above are regarded as agreed and below are regarded as disagreed. The questionnaire contained 3 sections, A, B and C respectively. Section A comprises of occupational health hazards in automobile workshops, section B comprises of causes of occupational health hazards and section C comprises the preventive measures of occupational health hazards. The study employed the use of microsoft excel and graph pad t- test calculator as instruments for analyzing the collected data.

### Results

#### Research Question 1

What are the occupational health hazards among roadside automobile mechanics in Minna metropolis?

**Table 1**  
Mean and standard deviation of respondents on the occupational health hazards among roadside automobile mechanics in Minna metropolis

S/N	ITEMS	Auto Mechanics A			Auto Mechanics B		
		$\bar{X}$	SD	DEC	$\bar{X}$	SD	DEC
1.	Falls from ladder, stairs, elevated platforms and falls into inspection pits	3.65	0.56	A	3.52	0.58	A
2.	Falls on the floor especially on wet, slippery or greasy garage floors	3.61	0.51	A	3.46	0.50	A
3.	Injuries due to collapse of jacking or lifting equipments	3.50	0.52	A	3.42	0.55	A
4.	Crushed toes resulting from falls of heavy objects	3.61	0.61	A	3.53	0.59	A
5.	Eye injury from splinters and flying objects	3.55	0.57	A	3.48	0.50	A
6.	Injuries as a result of being caught in or between moving and stationary objects	3.46	0.52	A	3.65	0.62	A
7.	Injuries caused by rotating parts of machine tools	3.43	0.64	A	3.40	0.51	A
8.	Burns due to contact with hot surfaces	3.44	0.61	A	3.39	0.53	A

9. Carbon monoxide poisoning	3.65	0.64	A	3.43	0.51	A
10. Fire and explosion of spilled or leaked flammable/explosives substances	3.57	0.59	A	3.50	0.53	A
11. Acute musculoskeletal injuries (inter vertebral disk rapture, tendon rapture, hernia etc)	3.60	0.68	A	3.49	0.66	A
12. Increased rate of road accidents during test driving	3.44	0.62	A	3.68	0.58	A
13. Punctures and cuts sauced by sharp edges	3.57	0.59	A	3.51	0.71	A
14. Bursting of tyres	2.10	0.49	D	2.48	0.45	D
15. Exposure to direct and reflected ultraviolet and infrared radiations	2.33	0.43	D	3.45	0.67	A
16. Exposure to hand -arm vibration from power driven hand tools	3.48	0.59	A	3.49	0.58	A
17. Exposure to excessive noise	3.58	0.68	A	3.47	0.57	A
18. Exposure to excessive temperatures	3.65	0.62	A	3.54	0.71	A
19. Exposure to chemicals including heavy metals contained in break fluids, egreasers , detergents, lubricants, metal cleaners, paint, fuel, solvent etc	2.70	0.54	A	3.68	0.64	A
20. Skin diseases and conditions (dermatitis, skin sensitization, eczema, oil acne etc)	3.33	0.68	A	3.45	0.67	A
21. Vomiting, as a result of contact with chemicals	2.40	0.53	D	3.67	0.73	A
22. Eye irritation, dizziness, nausea, breathing problems, headaches etc, caused by contact with chemicals	2.39	0.52	D	3.58	0.59	A
23. As betosis and mesothelioma caused by asbestos dust	3.00	0.53	A	2.45	0.55	D
24. Chronic poisoning resulting from exposure to lead	3.00	0.44	A	3.10	0.58	A
25. Increased risk of cancer due to inhalation of diesel exhaust fumes	3.40	0.52	A	3.36	0.59	A
26. Increased risk of organic brain damage due to inhalation of diesel exhaust fumes	3.50	0.62	A	3.38	0.61	A
27. Nuisance due to bad smell when working with certain solvents	2.45	0.67	D	3.64	0.73	A
28. Splash of corrosive and reactive chemicals that may cause eye and skin injuries	2.48	0.54	D	3.61	0.68	A
29. Risk of electrical shock	3.46	0.52	A	3.40	0.51	A
30. Danger of being attack by individuals (including dissatisfied customers)	3.48	0.58	A	3.51	0.60	A
31. Psychological stress when working under time pressure	3.54	0.63	A	3.69	0.69	A

Key: Mechanic A= Mechanics in engine repair shops, Mechanic B= Mechanics in body repair shops,  
 $\bar{X}$ = Mean, SD= Standard Deviation

The result that emerged from Table 1 above revealed that the respondent from engine repair shops agreed with twenty five (25) items and disagreed with six (6) items while respondents from body repair shops agreed with twenty nine (29) items and disagreed with two (2) items regarding the occupational health hazards among roadside automobile mechanics in Minna metropolis, Nigeria.

**Research Question 2**

What are the causes of occupational health hazards among roadside automobile mechanics in Minna metropolis?

**Table 2**  
Mean and Standard deviation of respondents on the causes of occupational Health hazards among roadside automobile mechanics in Minna.

S/N	ITEMS	Auto Mechanics A			Auto mechanics B		
		$\bar{X}$	SD	DEC	$\bar{X}$	SD	DEC
1.	Use of faulty tools and equipments	3.54	0.62	A	3.45	0.59	A
2.	Non compliance to standard safety rules and regulations	3.42	0.54	A	3.33	0.51	A
3.	Lack of experience	3.51	0.63	A	3.59	0.59	A
4.	Improper handling and storage of flammables, explosives and combustibles	3.50	0.63	A	3.43	0.63	A
5.	Improper handling of tools and equipments	3.47	0.56	A	3.56	0.53	A
6.	Work fatigue and boredom	3.51	0.65	A	3.59	0.49	A
7.	Attitude and action of managements towards safety	3.28	0.59	A	3.45	0.71	A
8.	Work operating environment	3.43	0.59	A	3.41	0.53	A
9.	Natural causes	3.45	0.64	A	3.51	0.57	A
10.	Inadequate working environment	3.35	0.51	A	3.42	0.51	A
11.	Workers physical condition	3.30	0.58	A	3.49	0.60	A
12.	Lack of job satisfaction by workers	3.43	0.54	A	3.40	0.51	A
13.	Monotony (constant exposure to a particular job)	3.50	0.61	A	3.49	0.64	A

The result that emerged from Table 2 above revealed that the respondents agreed with all the items regarding the causes of occupational health hazards among roadside automobile mechanics in Minna metropolis, Nigeria.

**Research Question 3**

What are the preventions of occupational health hazards among roadside automobile mechanics in Minna metropolis?

**Table 3**  
Mean and Standard deviation of respondents on the preventive measures of occupational health hazards among roadside automobile mechanics in Minna

S/N	ITEMS	Auto Mechanics A			Auto Mechanics B		
		$\bar{X}$	SD	DEC	$\bar{X}$	SD	DEC
1.	Provision of safe storage of flammables, explosives and combustibles	3.81	0.51	A	3.73	0.47	A
2.	Use of experienced or senior apprentices to enforce safety rules	3.54	0.48	A	3.61	0.45	A
3.	Encouragement of strict compliance to workshop safety rules	3.56	0.62	A	3.53	0.61	A
4.	Conducting of periodic safety seminars	3.45	0.52	A	3.45	0.63	A
5.	Use of safety posters, safety instructional cards, warning signs etc	3.49	0.60	A	3.47	0.53	A
6.	Special safety instructions for particular jobs	3.50	0.49	A	3.56	0.51	A

The result that emerged from Table 2 above revealed that the respondents agreed with all the items regarding the causes of occupational health hazards among roadside automobile mechanics in Minna metropolis, Nigeria.

### Hypothesis Testing

H<sub>11</sub> There is significant difference in the mean responses of Automobile Mechanics in engine repair shops and Automobile mechanics in body repair shops on occupational health hazards among roadside automobile mechanics.

**Table 4**  
T-test analysis of roadside auto mechanics in engine repair shops and auto mechanics in body repair shops on occupational health hazards in Minnametropolis.

Status of Respondents	N	$\bar{X}$	SD	DF	t-cal	Decision
Auto Mechanics A	120	3.23	0.57	198	2.3970	Significant.
Auto Mechanics B	80	3.43	0.59			

The analysis in Table 4 above reveals that the t-cal value is greater than the t-table value. Therefore, the alternative hypothesis was accepted regarding the occupational health hazards among roadside automobile mechanics in Minna metropolis, Nigeria.

### Findings of the Study

1. Occupational health hazards among automobile mechanics in the engine and body repair shops in Minna metropolis includes, falls from elevated platforms, into inspection pits, and on slippery floor, crushed toes, eye injuries and irritation, burns, exposure to noise, vibration and excessive temperature, risk of cancer, risk of brain damage, risk of electrical shocks, psychological stress and danger of being attacked by customers
2. Causes of occupational health hazards among roadside automobile mechanics in Minna metropolis include the use of faulty tools, non-compliance to safety rules, lack of experience, improper handling and storage of flammable, explosives and combustible, improper handling of tools and equipments, work fatigue and boredom, attitudes of management, work operating environment, natural cause, lack of job satisfaction and monotony.
3. Preventive measure of occupational health hazards among roadside automobile mechanic include, provision of safe storage for explosives and flammables, enforcement of safety rules by senior apprentice, periodic safety seminar, use of safety instructional cards and posters, special safety instruction for particular job.
4. There is significant difference in the mean responses of Automobile Mechanics in the engine repair shops and Automobile Mechanics in the Body repair shops on the occupational health hazards in roadside Automobile workshop.

### Discussion of Findings

The findings of this study emerging from Table 1 reveals that occupational health hazards among roadside automobile mechanics in engine repair shops and mechanics in body repair shops in Minna metropolis includes, falls from elevated platforms, into inspection pits, and on slippery floor, crushed toes, eye injuries and irritation, burns, exposure to noise, vibration and excessive temperature, risk of cancer, risk of brain damage, risk of electrical shocks, psychological stress and danger of being attacked by customers. Peterson (2014), also noted that automobile mechanics are exposed to variety of hazards in the work shop: slip and falls, accidents caused by spilled motor oil, cuts and bruises from mishandling tools and also exposure to asbestos from replacement of car parts. The finding also revealed that eye injury, eye irritation, dizziness, breathing problems, headache, vomiting, skin diseases chronic poisoning from exposure to chemicals and heavy metal are occupational health hazards among panel beaters. Bristow (2012), in her work on workshop hazard stressed that auto mechanics in body shop repair are exposed to wide range of chemicals that include heavy metals such as the ones contained in brake fluids, detergents, lubricants, degreasers, paints, metal cleaners, solvents and fluids. Contact exposure to these will lead to chronic poisoning.

The findings from Table 2 revealed that, the causes of occupational health hazards among roadside automobile mechanics in Minna metropolis include the use of faulty tools, non-compliance to safety rules, lack of experience, improper handling and storage of flammable, explosives and combustible, improper handling of tools and equipment, work fatigue and boredom, attitudes of management, work operating environment, natural cause, lack of job satisfaction and monotony. The findings are in concord with the views of Moen and Holland (2000) that, non effective compliance to health and safety regulations amounts to occupational hazards among local mechanics and Hamlett (2014), also revealed that fatigue and stress as a result of exceeding beyond reasonable working limits results often to physical and mental exhaustion which is not only more likely to cause injury but also invites an increased risk of a heart attack, stroke or hypertension.

The findings on Table 3 revealed that the preventive measure of occupational health hazards among roadside automobile mechanic include, provision of safe storage for explosives and flammables, enforcement of safety rules by senior apprentice, periodic safety seminar, use of safety instructional cards and posters, special safety instruction for particular job. Sabitu, Iliyasu and Dauda (2009), in their work on occupational hazards in Kaduna recommended that adherence to safety rules and regulations can reduce occupational hazards within the automobile repair shop is very important.

### Conclusion

Based on the findings of the study, it could be concluded that roadside automobile mechanics are engaged in several occupational health hazards ranging from physical accidents, chemical hazards and human factor that are mainly caused by improper storage of chemicals, materials and equipment, use of faulty tools among others. Nevertheless, enforcement and compliance to workshop safety rules could prevent occupational health hazards among roadside mechanics.

### Recommendations

Based on the findings, the following recommendations were made:

1. The use of safety wears should be encouraged among roadside mechanics to minimize the effects of occupational health hazards in roadside automobile workshops.
2. Adherence to workshop safety rules and regulation should be strictly enforced in the roadside automobile workshops, especially by the senior mechanics.
3. Roadside mechanics should be educated on occupational health hazard through seminars, workshops, conferences and provisions of safety signs.

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