

Determinants of Occupational Health Hazards among Roadside Automobile Mechanics in Zaria, North Western Nigeria.

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ABSTRACT:

Background: In spite of the progress made so far, in occupational health and safety in Nigeria, it is reported that the level of mechanics' knowledge of the hazards of their occupation or of the existing legislation which should contribute to improving occupational health and safety practice is still low and thus predispose them to various types of occupational hazards. **Objectives:** This study is aimed at identifying the determinants of occupational health hazards among road side automobile mechanics in Zaria and to determine the level of their knowledge and practice on the use of personal protective equipment. **Method:** This is a cross sectional descriptive study to identify the pattern of occupational health hazard, knowledge and practice of safety measures amongst roadside automobile mechanics in Zaria using interviewer administered questionnaire. **Results:** Out of the 200 respondents, 53.5% had secondary education, 29.5% had primary education while 3.5% were illiterate and 12.5% had informal education. Full time mechanics constituted 82%. Majority of the mechanics 44.5% were involved in general vehicle repairs, 26.5% were motor engine mechanics, 15% were auto electricians and 9% were welders. The commonest injuries were burns (86%), bruises (64.5%), crushed digits (62%) and cuts (59%). Forty nine percent (49%) had experienced low backaches, 15% had joint pains, and 7% had hernia. Eighty two percent (82%) were aware of protective devices. The commonest known safety devices were overalls (85%), boots (82.5%) and rubber gloves (80%) while the least known type of safety device was earmuff (25.5%) and barrier cream (3.5%). More than 3/4 (77.5%) were trained via apprenticeship and only 28% trained for more than 6 years. Majority (77.5%) worked 6–11 hours daily. **Conclusion:** The study shows that training type, duration of training, years of experience and level of awareness of protective device are the major determinants of occupational hazards among roadside automobile mechanics in Zaria. Also there was high level of awareness but low usage of protective device among respondents. There is need for emphasis on health education through programs promoting work place safety among automobile workers.

Key words: Mechanic, injury, burns, awareness

INTRODUCTION

Occupational diseases and disorders are those associated with a particular occupation or industry.¹ They occur as a result of physical, chemical, social, biological and psychological factors present at work as encountered in the course of employment.¹ Furthermore, occupational hazards and diseases can be ascribed to improper working conditions and their occurrence can be prevented.^{1,2} The control of occupational hazards decreases the incidence of accidents and work related diseases and as

well improves the health and general morale of the labor force.² This in turn leads to increased workers efficiency and decreased absenteeism from work.³ In most cases the economic benefits far outweigh the costs of eliminating hazards.¹ ⁴Alongside the advancement in technology, more risky and fatal work place hazards have developed. Some of these hazards have been recognized while others remain unrecognized. To solve this problem a responsive occupational health service is required.³

Nigeria was a predominantly agricultural country until mining and other manufacturing industries were established, especially with the discovery of oil which led to establishment of refining and petrochemical industries that brought economic prosperity which opened opportunities for many Nigerians to become

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owners of automobile vehicles with consequent increase in the demand for more mechanics who repair these vehicles.^{3,5,7} These repairs are performed by road side mechanics.^{5,7} Mechanics work in roadside garages or workshops where they may fall from elevated platforms, ladders and trip on wet greasy floors.^{5,7} They may be injured by faulty equipment such as jacks or lifts, by moving vehicles in the workshops or from the roadside, by heavy parts falling on their feet or by bursting tires.^{5,6} Vehicle parts such as fan belts could loosen and become projectiles causing injury to any parts of the body.⁶ In addition, since they often handle heavy vehicle parts and work in awkward postures, this may lead to some medical conditions such as hernia, disabling back aches, joints pain and bruise or cuts to the limbs.^{5,9}

Road side automobile mechanics belong to the informal sector of a developing country like Nigeria and the occupational problems and health needs of these workers are mainly not documented.⁷ Therefore, very little is done to cater for their health needs and incorporate them into the scheme of conventional health care delivery system.^{7,10-11} In light of this, our study aimed to assess the pattern of occupational health hazards among roadside automobile mechanics in Zaria – North West Nigeria.

METHODOLOGY

Study design: This cross sectional descriptive study employed quantitative design conducted in May 2009.

Study area and population: The study was carried out among road side mechanics in Zaria located in Kaduna State, northwest Nigeria. The study population includes all roadside mechanics in Zaria.

Sample size calculation: The sample size for the study was calculated using the formula for cross sectional study. Using the assumption that the proportion of those estimated to have necessary knowledge of safety measure to be 85%, 95% confidence interval and 5% marginal error, a total of 200 mechanics were required for the study.¹¹

Data collection: This was done with the assistance of the Automobile Mechanics Trades Union after approval was given by the Department of Community Medicine, Ahmadu Bello University, Zaria. The data

was collected using a 4 – part interviewer administered questionnaire and an assessment schedule of the mechanics' work environment was made based on observation. The pretested questionnaires were both open and closed types and they contained questions on personal and occupational history of these roadside mechanics as well as information on occupational hazards and predisposing factors leading to them and the knowledge, attitude and practice of safety measures. The whole exercise involved recruited assistants trained on the objectives and importance of the questions asked in the study. The questionnaires were checked for completeness and entered into the Statistical Package for Social Science (SPSS) Version 17.0. The data was summarized using frequencies, percentages and presented as contingency tables and charts. Chi square was used as the statistical test of significance and p-value was set at $p < 0.05$.

Ethical considerations: Approval for the study was sought from the Ethical Committee of Ahmadu Bello University Teaching Hospital Zaria. Informed written consent was obtained from each study subject after thorough explanation of the objectives and the procedures of the study. Moreover, the benefit of this study were explained to the study population in that the union and other concerned body can utilize the results in improving occupational health safety. Confidentiality was ensured by making the questionnaire anonymous and avoiding personal identifications.

RESULTS:

Of the 200 mechanics interviewed, more than half (59%) were 30years and above, 31% were between 20 and 29 years. Forty one percent (41%) were Yoruba, 31.5%, Hausa/Fulani, 16% Igbos and other tribes constituted 11.5%. More than half (53.5%) of the respondents had secondary education, 29.5% had primary education while 12.5% and 3.5% had informal and no form of education respectively. More than one third of respondents made daily income of between N1001 – N3000 followed by 30% that made N500 – N1000 daily (Table 1). Majority of the mechanics (82%) worked full

time while less than half (44.5%) were involved in general vehicle repairs (Table 2). More than 3/4 (77.5%) were trained via apprenticeship and only 28% trained for more than 6 years. Majority (77.5%) worked 6–11 hours daily. There was statistically significant association between training type, years of training and years of experience with frequency of accident while that between hour variance was not statistically significant (Tables 3 & 4).

The commonest injuries/complications were burns (86%), bruises (64.5%), crushed digits (62%) and cuts (59%) backaches (49%), joint pains (15%) and 7 % had hernia (Fig 1). More than half (50.5%) of the burns were due to contact with hot surface followed by sudden opening of radiator. On the pattern of ergonomic hazards, less than half (49%) of respondents reported back pains, 15% joints pains, 7% hernia, 5% sprain and 24% reported no ergonomic hazard.

Majority (82%) of the mechanics were aware of protective devices while 36 (18%) had no awareness. Less than 2/3 (64%) of respondents got informed on protective through co-workers, 11.5% had through mass media and only 6.5% had special safety training. Less than half (49%) practice the use of at least one protective device occasionally, 37% do not use protective device while 14% used it regularly. The commonest known safety devices were overall (85%), boots (82.5%), rubber gloves (80%) while the least known type of safety device were barrier cream and earmuffs. More than 2/3 (69%) of respondents had possessed overalls while only 1.5% used barrier creams and earmuffs. There was statistically significant association between awareness and frequency of hazards among the respondents ($X^2=9.61$, p -value= 0.0082).

Less than 3/4 (71%) of the work place were considered to be inadequate, fire extinguishers were absent in 74.5% of workshops and first aid box was absent in 95.5% of the workshops assessed. Surrounding cleanliness was inadequate in 65% of the mechanic workshops assessed while it was adequate in 34.5% of workshops.

Table 1: Socio-demographic Characteristic of Respondents

Variables	n(%)
Age Group	
10-14	8 (4)
15-19	12(6)
20-24	40(20)
25-29	22(11)
30-34	37(18.5)
35-39	39(19.5)
40+	42(21)
Ethnicity	
Hausa/Fulani	63(31.5)
Yoruba	82(41)
Igbo	32(16)
Others	23(11.5)
Educational level	
None	7(3.5)
Informal	25(12.5)
Primary	59(29.5)
Secondary	107(53.5)
Daily Income (Naira)	
<500	25(12.5)
500 – 1000	60(30)
1001 – 3000	88(44)
>3000	27(13.5)

Table 2: Work Pattern and Job Description of Respondents

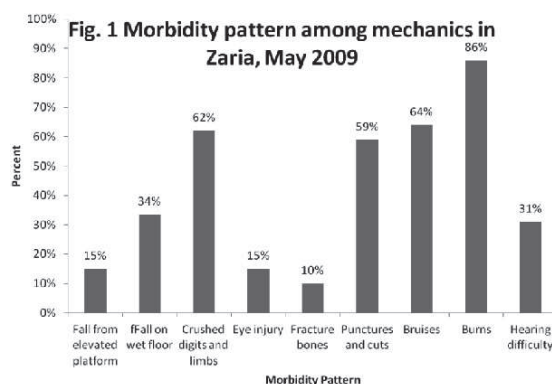
Variables	n(%)
Work Pattern	
Full time	164(82)
Part time	18(36)
Job Description	
General vehicle repairs	89(44.5)
Auto electrician	30(15)
Welder	18(9)
Motor engine repairs	53(26.5)
Panel beater	10(5)

Table 3: Training type and frequency of accident

Variables	Frequency Of Accidents		
	Monthly n (%)	6 Monthly n (%)	Yearly n (%)
Training type			
Apprenticeship	28 (18.1)	37 (23.9)	90 (58.0)
Via a friend	22 (61.1)	8 (22.2)	6 (16.7)
None	5 (55.6)	2 (22.2)	2 (22.2)
	Odd ratio=34.02, df=4, p-value= < 0.0001		
Duration of training			
< 6 years	87 (61.3)	24 (16.9)	31 (21.8)
>6years	21 (37.5)	18 (32.1)	17 (30.4)
	$\chi^2 = 9.76$ df=2 pvalue= 0.0076		

Table 4: Years of experience and work variance

Variables	Frequency Of Accidents		
	Monthly n (%)	6 Monthly	Yearly
Yrs of experience			
< 4	11 (44)	8 (32)	6 (24)
5-9	31 (52.5)	19 (32.2)	9 (15.3)
10-14	14 (28.6)	20 (40.8)	14 (28.6)
15-19	8 (30.8)	7 (26.9)	11 (42.3)
>20	5 (12.2)	14 (34.1)	22 (53.7)
	$\chi^2=26.82, df=8, p\text{-value}= 0.0008$		
Hour variance per day			
< 6	4 (14.3)	6 (21.4)	8 (28.6)
6-11	59 (38.1)	51 (32.9)	45 (29)
12-18	14 (51.9)	6 (22.2)	7 (25.9)
	$\chi^2=4.8, df= 4, p\text{-value}= 0.3084$		



DISCUSSION

Roadside mechanical activities especially in Nigeria are predominantly a masculine job. Majority of these men are young, this study revealed that 59.5% are below the age of 35years. This is in agreement with the findings of Omokhodion that 50% of automobile mechanics are below 35 years of age.⁵⁻⁶ From this study it was observed that Yorubas were more engaged in automobile mechanics (41%). Eighty three (83%) percent of respondents had formal education, 12.5% had informal education, while 3.5% attested to being illiterate. This is similar with Jinadu's work wherein 93.1% had formal education with 6.9% having no education.⁷

In the occupational history, while 38% were the owners of their workshop, 62% were apprentices. Also, 82% of the mechanics worked full time while 18% worked part time since they are engaged in other jobs. Less than half (45.5%) of the respondents earn between N1000-N3000 per day and this could be due to the increase in importation of second hand cars. Majority

(77.5%) of the respondents were trained through the apprenticeship while 18% were trained by friends. Also 71% of the mechanics were trained for less than 6 years. The study found a statistically significant association between training type and duration with frequency of ergonomic hazards. This study showed that 12.5% of the mechanics had less than 5 years working experience while 87.5% had 5 years and above. This agrees with Jinadu where 30.8% of mechanics had 0-5 years experience while 69.2% had 5 years and above experience in the work.⁷ Most of the respondents (97.5%) reported working for between 6-11 hours per day. The findings from this study showed a statistically significant association between years of experience and frequency of ergonomic hazards ($p < 0.05$) but the association between hour variance per day was statistically insignificant.

In the morbidity pattern among the automobile mechanics, the commonest injury was burns. Various reasons had been given for the burns, the highest cause was due to hot surface (50.5%), followed by burns due to sudden opening of radiators (21%), then chemicals and electrocution. Other injuries in order of occurrence were bruises and cuts (64.5% and 59% respectively). The ergonomic hazard experienced by most of the mechanics was low backache accounting for 49% and this could be due to the discomforting positions they are forced to adapt in the process of vehicular repair. The next were joint pains and hernia (15% and 7% respectively) and this could be due to the heavy weights they carry. Among the mechanics sampled, 38% admitted to having had accident with customers' vehicles whereas 62% had not had accident with customers' vehicles. Twenty one (21%) percent had experienced physical assault while 70% had experienced verbal abuse from customers and this in part could be due to the way these workers are being looked down upon. These experiences go a long way to determine the workers attitude to the job. The major cause of absenteeism in the last 3 months was burns accounting for 23.5% followed by fall (11.5%), fever (10.5%), breathing difficulties (9%) and fractures (3%).

In this study, there was high awareness among respondents on protective equipment as

82% were aware of any safety devices. This finding might be related to the high literacy level among respondents, the key to the avoidance of the hazards is to appreciate them and to use the available protective device. There is a gap between awareness and usage as only 14% of the respondents make use of protective devices regularly while 49% use them occasionally and 37% do not use at all. This finding concurred with that of Omokhodion who in her study revealed that of 141 respondents, 47% had overalls and only 25% were actually wearing them⁵⁻⁶. This study found a statistically significant association between awareness of protective device and frequency of ergonomic hazards ($p < 0.05$). Sixty four (64%) percent of respondents learnt about safety devices from their colleagues, 11.5% through mass media (electronic, print or both) and only a little proportion received special training. Previous authors opined that workers should be told of something dangerous to their health which they have to come in contact with and they should not be allowed to find out for themselves as this could lead to loss of lives which could have been prevented.⁹⁻¹⁵

Adequate work space was noted in 29% of the workshops, 71% had inadequate space as the workshop occupied only half of the total land space. In agreement with Jinadu's study, about 75% of workshops have no fire extinguishers, only 1% that had fairly equipped first aid box, it was totally absent in 95.5% and hand wash basin with soap was absent in 72.5% of the workshops assessed.^{7,13} Also more than half of the mechanics operate in unhealthy environment as evidenced by the presence of scrap metals, refuse and dust. Specifically 34.5% had averagely adequate cleanliness while 65.5% had inadequate cleanliness.

In conclusion, the major determinants of hazard among road side mechanics in Zaria are training type, training duration, years of experience and level of awareness of protective device. The commonest injury and ergonomic hazard suffered by mechanics from this study is burns from hot surfaces and back ache respectively. There was high level of awareness but low usage of protective device among respondents. Also most of the workshops have

inadequate work space with no proper safety equipment. Therefore, there is need for emphasis on health education through programs promoting work place safety among automobile workers. In addition the development of multifaceted automobile workers and public health education programs, the intensification of the use of personal protective equipment among workers will go a long way in reducing occupational hazards.

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