

Original Research Paper

Practice of Safety Measures by Production Workers in two Nigerian Automobile Assembly Plants

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Background: The practice of safety measures by workers in every industry and in particular automobile assembly industry is paramount to the maintenance of optimal health. Hence the need to study what actually is being practiced by the workers in automobile assembly companies. This study focused on the practice of safety measures by the workers in the 2 automobile assembly plants. **Methods:** All the production staff in two Automobile assembly plants were studied in this cross-sectional descriptive study. Three hundred and eighteen production staff participated in this study. A semi-structured interviewer-administered questionnaire was used. Data collected was analysed with the aid of the computer software: Statistical Package for Social Sciences (SPSS) Version 20. Frequency distributions and percentages of all relevant variables were represented in tables for easy appreciation. **Results:** Three hundred and eighteen production staff of the two automobile plants participated in this study giving a response rate of 100%. There were more males (96.9%), and majority of the respondents were single (72%). The commonest age group was the 26 – 30 years age group (37.4%). Majority of the respondents had secondary education (94%). Only 19.2% of the respondents underwent medical examination before they started working at the companies. Among all the respondents, only 182 (57.2%) agreed that they did go for periodic medical examination. Only 26.1% of the respondents reported that their employer organized occupational health and safety training programme for newly employed workers. Ninety-two (28.9%) of the respondents reported that their employer organized periodic trainings for workers. All the respondents (100.0%) agreed that they were provided PPDs in their workplace. However, only 38.4% of respondents were trained on the use of PPDs and only 14.9% used the PPDs always. **Conclusion:** This study has shown that the workers practice of safety measures was poor. We recommend that managements of the companies provide all the necessary PPDs, organise occupational safety and health trainings for new staff and periodic trainings for old staff and also enforce safety rules.

Keywords: Practice, Safety measures, Production workers, Automobile assembly plant.

INTRODUCTION

Occupational Health is the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention among workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the workers in an occupational environment adapted to his physiological and psychological equipment, and to summarize, the adaptation of work to man and of each man to his job.¹

It is estimated that there are globally about 2.02 million deaths annually caused by diseases due to work, while the annual global number of cases of non-fatal work-related diseases is estimated to be 160 million.² Occupational injuries have been said to account for more than 10 million DALYs and 8% of unintentional injuries worldwide.³ The ILO estimates that

about 4% of Gross Domestic Product (GDP) worldwide is lost because of work-related diseases and injuries.⁴ According to the publication: "Comparative quantification of health risks", occupational risk factors were responsible for 775,000 deaths worldwide in the year 2000.⁵ There are no data on the burden of occupational diseases and injuries in Nigeria and Nigeria is conspicuously absent among the country profiles in the ILO website where countries' occupational safety and health statistics are presented.⁶ Also, Nigeria was not listed in the country index in the occupational safety and world (OSHWORLD) website.⁷

In the automobile industry, workers are exposed to several hazards including: high noise levels, excessive heat, physical injuries like cuts, lacerations and amputations, inhalation of chemicals which cause respiratory problems and cancers,

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chemical burns, inhalation of welding fumes, heavy metals poisoning such as lead, musculoskeletal problems, eye problems from welding, skin problems etc.^{8,9,10} Among other measures to protect the health of the workers, there must be optimal practice of safety measures by the workers themselves.

In Nigeria, there are very few studies on the automobile industry. This is understandable because there are very few automobile assembly plants in the country. After extensive literature search, only one study on occupational hazards in automobile assembly plant in Nigeria was found. This study was done at Peugeot Automobile Nigeria Limited (PAN) Kaduna, Nigeria. The study reported that the workers were exposed to chemical fumes, noise pollution, chemical burns, injury by metal chips, cuts, eye irritation, dry cough etc.¹¹ This justifies our study which was aimed at generating data on the practice of safety measures by production workers in automobile assembly plants in Nigeria.

METHODS

Setting

This study was carried out in two automobile assembly plants in Nigeria. The names of these plants will not be revealed in this work because the authors reached an agreement with the managements of the two automobile companies that the names of the plants will not be mentioned in the publications. Also, the locations of the plants will not be revealed because they are the only automobile assembly plants in their respective locations, which implies that once their locations are mentioned, the names of the automobile plants can be easily deduced by anybody who knows the locations. The two companies will be designated as Plant A and Plant B.

Plant A produces heavy-duty vehicles, middle-level buses and high-level buses. The production department of the company is made up of the following sections: Body shop, Spray shop, Final finishing, Chassis assembly and Auto electrical section. There are 268 staff in the production department. The breakdown is as follows: Body shop (79), Spray shop (45), Final finishing (82), chassis assembly (40), Auto electrical section (22).

Plant B's main line of business is assembly and production of commercial vehicles including Trucks, buses and utility vehicles. Over the years the company has produced over 30,000 units of commercial vehicles. The production department of plant B is divided into the following sections: Body shop, Trimline, Rectification, Paint Shop and Chassis assembly. There are 50 staff in the production department, broken down as follows: Body Shop(23), Trimline(7), Rectification(9), Paint shop(7), Chassis assembly(4).

Study Design

This study was a Cross-sectional, descriptive study, and was part of a bigger study that was submitted in partial fulfilment of the requirements for the award of the fellowship of the National Postgraduate Medical College of Nigeria.

Study Population

The study population comprises all the staff in the production department of the two companies. This is because the study is interested in the hazards that are experienced in the automobile assembly process such as high temperatures, chemicals, ergonomic on issues, high noise levels, metal

dusts, fumes, electrocution, etc and it is the production staff that are directly exposed to these hazards. This is in tandem with several other studies that studied automobile assembly safety measures.^{11,12,13,14,15,16,17}

Inclusion Criteria

Eligible respondents were workers in the production department of the automobile assembly companies who have worked in the production department for at least 6 months, because they were considered to have had enough exposure to the hazards and also would be able to give information on the situation of things in the companies. Only such workers who gave their consent were administered the questionnaire.

Exclusion Criteria

Production staff who have not worked for at least 6 months, production staff that denied consent, production staff that were on leave during the period of the data collection were all excluded from the study.

Sample Size Determination

Using the formula for determination of minimum sample size in a cross-sectional study.¹⁸

For population > 10,000

$$n = \frac{z^2 pq}{d^2}$$

n = the minimum sample size

z = the standard normal deviate = 1.96

p = the proportion of the target population that has a particular characteristic. In this case p = 0.46 (proportion of workers in an automobile assembly plant in Kaduna that are exposed to the commonest occupational hazard (chemical fumes) in the plant according to the study.¹¹

$$q = 1 - p = 1 - 0.46 = 0.54$$

d = degree of accuracy = 0.05

$$n = \frac{1.96^2 \times 0.46 \times 0.54}{0.05^2}$$

$$n = \frac{3.84 \times 0.25}{0.0025}$$

$$n = \frac{0.96}{0.0025}$$

$$n = 384$$

But the population of the workers is 318 which is less than 10,000, hence a step further is taken to calculate for population less than 10,000 as stated in the formula thus¹⁸:

$$nf = \frac{n}{1 + \frac{(n)}{N}}$$

where nf = minimum sample size when population is less than 10,000

n = minimum sample size when population is greater than 10,000

N = the population size

Applying the respective values:

$$\begin{aligned} nf &= \frac{384}{1 + \frac{(384)}{318}} \\ &= \frac{384}{1 + 1.21} \\ &= \frac{384}{2.21} \end{aligned}$$

$$nf = 174$$

Hence the minimum sample size is 174. But in order to increase the power of the study, all the 318 production workers in the two automobile assembly companies were sampled.

Sampling Technique

Total population sampling was used because all the production staff (318), in the two automobile assembly companies were administered questionnaires.

Instrument of Data Collection

A semi-structured interviewer-administered questionnaire was purposely designed for this study. It was pre-tested and appropriate corrections made.

Data Entry and Analysis

Data collected was analysed with the aid of the computer software: Statistical Package for Social Sciences (SPSS) Version 20. Frequency distributions and percentages of all relevant variables were represented in tables and charts for easy appreciation.

Ethical Consideration

Ethical approval was obtained from the Nnamdi Azikiwe University Teaching Hospital Ethical Committee (NAUTHEC). Permission to carry out this study was obtained from the management of the companies. Before the questionnaire was administered to each respondent, the concept and purpose of the study was carefully explained to the respondent. The respondents were also assured of confidentiality. Only consenting workers were administered questionnaires.

RESULTS

Three hundred and eighteen questionnaires were administered and all of them were retrieved, giving a response rate of 100%. Out of the 318 respondents, 268 (84.3%) were Plant A staff, while 50 (15.7%) were Plant B staff. Table 1 shows the socio-demographic characteristics of the respondents. Out of the 318 respondents, 50 (15.7%) were workers in Plant A, while 268 (84.3%) were workers in Plant B. There were 308 (96.9%) males and only 10 (3.1%) females. The commonest age group was the 26-30 years age group, 119 (37.4%) while the least common age group was the 36-40 years age group 5 (1.6%). The mean age was 27.88 years with a standard deviation of ± 7.28 years. There were 229 (72.0%) single respondents, while 86 (27.0%) were married. Majority of the respondents had

secondary education 299 (94.0%), while 19 (6.0%) had tertiary education. None of the respondents had no formal education. The proportion 141 (44.3%) have worked for 3 to 4 years. Only 3 (0.9%) respondents have worked for 5 to 6 years. The mean number of years of working in the companies was 3.62 years (± 4.07 years). The body shop section had the highest number of workers 102 (32.1%), followed by the final finishing section 82 (25.8%), the paint/spray shop section 52 (16.4%), the chassis assembly 44 (13.8%), the auto electricals section 22 (6.9%), the rectification section 9 (2.8%), and finally the trimline section 7 (2.2%).

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Table 3 shows the practice of occupational health and safety by the companies. Two hundred and thirty-five (73.9%) of the respondents reported that their employer did not organize occupational safety and health training for newly employed workers, while 26.1% reported that their employer organized occupational health and safety training programme for newly employed workers. Ninety-two (28.9%) of the respondents reported that their employer organized periodic trainings for workers, while 71.1% reported that their employer did not organize periodic trainings. Among the 92 respondents who reported that their employer organized periodic trainings, 43.5% reported that the trainings were done yearly, while 13.0% 12.0% and 31.5% reported that the trainings were done every two years, every three years and irregularly, respectively.

Table 4 shows availability and use of PPDs by the respondents. All the respondents (100.0%) agreed that they were provided PPDs in their workplace. Two hundred and sixty-six (83.6%) of the respondents reported that hand gloves were provided while 62.2% reported that eye goggles were provided. Aprons/overalls, boots, helmets, ear plugs and respirators were reported provided by 33.6%, 33.0%, 22.6%, 9.1% and 1.6% respectively. Table 4 also shows that 38.4% of respondents were trained on the use of PPDs. Three hundred and seven (96.5%) of the respondents made use of the PPDs. Out of these 307 respondents, 43.0% used the PPDs rarely, 42.0% used the PPDs occasionally, while 14.9% used the PPDs always. Among the 11 respondents who did not make use of PPDs, 10 (90.9%) of them said the PPDs made them feel hot, while 9.1% said that the PPDs were not necessary.

Table 5 shows respondents' opinion about modification of PPDs. Majority of the respondents 231 (73.6%) did not feel that the PPDs needed modification to suit them, while 87 (27.4%) felt there were PPDs that needed to be modified.

Table 1: Socio-demographic characteristics of respondents

Variables	Frequency (N =318)	Percentage
Company		
Plant A	50	15.7
Plant B	268	84.3
Sex		
Male	308	96.9
Female	10	3.1
Age (years)		
≤20	36	11.3
21-25	96	30.2
26-30	119	37.4
31-35	35	11.0
36-40	5	1.6
>40	27	8.5
Mean (SD)	27.88 (7.28)	
Marital status		
Single	229	72.0
Married	86	27.0
Widowed	2	0.6
Separated	1	0.3
Highest level of Education		
No formal education	0	0
Primary education	0	0
Secondary education	299	94.0
Tertiary education	19	6.0
Duration of employment (yrs)		
1-2	141	44.3
3-4	141	44.3
5-6	3	0.9
7-8	4	1.3
9-10	10	3.1
>10	19	6.0
Mean (SD)	3.62 (4.67)	
Section (Department)		
Body shop	102	32.1
Trimeline	7	2.2
Paint/Spray shop	52	16.4
Chassis assembly	44	13.8
Final finishing	82	25.8
Rectification	9	2.8
Auto electrical	22	6.9

Table 2: Practice of preventive measures of occupational diseases by the respondents Variables

	Frequency (N =318)	Percentage
Respondents that had pre-employment examination		
Yes	61	19.2
No	257	80.8
Medical examinations respondents had		
Chest X-Ray	51	16.0
Blood tests	45	14.2
Urine tests	45	14.2
Physical examination	46	14.5
Respondents that went for periodic medical examination		
Yes	182	57.2
No	136	42.8
Frequency of periodic medical examination (n=182)		
Every 6 months	98	53.8
Only when you feel sick	50	27.5
Every 2 years	18	9.9
Yearly	16	8.9
Reasons for not having periodic medical examinations (n=136)		
Lack of funds	78	57.4
Not necessary	58	42.6

Table 3: Practice of occupational health and safety by the companies

Variables	Frequency (N =318)	Percentage
Respondents whose employer organizes occupational health & safety training programs for newly employed workers		
Yes	83	26.1
No	235	73.9
Respondents whose employer organizes periodic occupational safety & health training programs for workers		
Yes	92	28.9
No	226	71.1
Frequency of periodic trainings (n=92)		
Yearly	40	43.5
Every two years	12	13.0
Every three years	11	12.0
Irregularly	29	31.5

Table 4: Availability and use of personal protective devices

Variables	Frequency (N =318)	Percentage
Respondents provided PPDs in their workplace		
Yes	318	100.0
No	0	0.0
PPDs that were provided (multiples responses)		
Hand gloves	266	83.6
Eye goggles	220	69.2
Face masks	200	62.9
Apron/overall	107	33.6
Boots	105	33.0
Helmets	72	22.6
Ear plugs/muffs	29	9.1
Respirator	5	1.6
Others	2	0.6
Respondents that were trained on the use of PPDs		
Yes	122	38.4
No	196	61.6
Respondents who made use of the PPDs		
Yes	307	96.5
No	11	3.5
Frequency of use of PPDs (n=307)		
Always	46	14.9
Occasionally	129	42.0
Rarely	132	43.0
Reasons for not using PPDs (n=11)		
The PPDs are not necessary	1	9.1
The PPDs make me feel hot	10	90.9
Respondents who thought they needed PPDs but the PPDs were not provided		
Yes	12	3.8
No	306	96.2
PPDs that were not provided (n=12)		
Apron	1	8.3
Boots	11	91.7

Among the 87 respondents who desired some PPDs modified, 70.1% desired the aprons/overalls modified, while 27.6% desired the boots modified. Other PPDs some respondents desired modified were eye goggles (23.0%), ear plugs/muffs (16.1%), helmets (5.7%), gloves (5.7%), face mask (3.4%).

Table 6 shows the occupational safety and health measures taken by the companies as reported by the respondents. Table 13 shows that 169 (53.1%) of the respondents felt that their employer was taking measures to prevent occupational illnesses/injuries, while 149 (46.9%) felt that their employer was not taking measures to prevent occupational illnesses/injuries. The commonest measure identified by the workers was the provision of medical/first aid services (72.8%), followed by warning signs (37.3%), provision of PPDs (34.9%), periodic medical examination (24.3%) and enforcement of the use of PPDs (23.7%). Other safety measures identified were: periodic workplace inspection (22.5%), good housekeeping (21.3%), periodic training on

occupational safety and health (20.1%) and isolation of dangerous areas (18.3%).

DISCUSSION

This cross-sectional descriptive study was carried out among production workers in two automobile assembly companies in Nigeria. The study aimed to determine the safety measures practiced by the production workers in the two automobile assembly plants.

In this study, there were more male respondents (84.3%) than female respondents (15.7%). This is similar to the sex distribution in a study at a car assembly plant in Kaduna, Nigeria¹¹ where 71.8% were males and 28.2% were females. Also in a petroleum refinery at Kaduna, Nigeria 90% of the workers was males.¹⁹ Also, a study among automobile industry workers in the United States reported 74.1% males and 25.9% females.²⁰

Table 5: Respondents' opinion about modification of PPDs Variables

	Frequency (N =318)	Percentage
Respondents who wanted some PPDs Modified to suit their work		
Yes	87	27.4
No	231	72.6
PPDs respondents felt should be modified (multiple responses) (n=87)		
Apron/overall	61	70.1
Boots	24	27.6
Eye goggles	20	23.0
Ear plugs/muffs	14	16.1
Helmets	5	5.7
Gloves	5	5.7
Face mask	3	3.4

Table 6: Occupational health measures taken by companies as reported by the respondents Variables

	Frequency (N =318)	Percentage
Respondents opinion regarding whether their employer was taking measures to prevent occupational illnesses/injuries		
Yes	169	53.1
No	149	46.9
Measures taken by the companies (n=169)		
Provision of medical/first aid services	123	72.8
Warning signs	63	37.3
Provision of PPDs	59	34.9
Periodic medical exam	45	26.6
Pre-employment medical exam	41	24.3
Enforcement of use of PPDs	40	23.7
Periodic workplace inspection	38	22.5
Good housekeeping	36	21.3
Periodic training on OSH	34	20.1
Isolation of dangerous areas	31	18.3

This male predominance among factory workers may be because factory jobs are physically tasking hence females tend to avoid them. In this study, the commonest age group was the 26-30 years age group (37.4%). This is different from the finding at an automobile assembly company in Kaduna, Nigeria where the commonest age group was the 30-39 years age group.¹¹ Also, a study at a refinery in Kaduna reported that the commonest age group was the 35-39 years age group (24%).¹⁹ However, a similar finding was reported among stone quarry workers in Zaria, Nigeria where the commonest age group was the 25-29 years age group (37.8%).²¹ It must be noted that though there were differences in the commonest age groups, they all fell within the young and productive age groups.

In this study, majority of the respondents were single (72.0%). A study reported that majority of the workers (52.7%) in an automobile assembly plant in Kaduna, Nigeria were married,¹¹ also majority of the workers (72.0%) in a refinery at

Kaduna were married. The preponderance of single respondents in this study may be explained by the fact that majority of the respondents are males and they are in the younger age group compared to the older age groups in the other studies cited.

In this study, majority of the respondents had secondary education (94.0%) similarly majority of the welders in Kaduna (62.7%) had secondary education.²² In contrast, majority (50.0%) of the workers in an automobile assembly plant in Kaduna had tertiary education.¹¹ This is also the situation in a refinery in Kaduna, where majority (78.0%) of the workers had tertiary education.¹⁹ The preponderance of secondary school certificate holders in this study may be because the production workers are semi-skilled staff who are employed with senior school certificate and then trained to work under the supervision of few engineers.

In this study, majority (44.3%) of the respondents had worked for 3-4 years. This contrasts the finding among welders in Kaduna, Nigeria where majority (36.4%) have worked for 5-9 years.²² Also majority (28.6%) of the welders in Benin city Nigeria have worked for 16-20 years.²³ Similarly, majority (47.3%) of the workers in a stone quarry in Kaduna, Nigeria have worked for 12-59 years.²¹ The relatively short duration of service of the respondents in this study is because majority of the workers are employed in a new automobile assembly company which started operations just a few years ago.

In this study majority (32.1%) of the respondents work in the Body shop section. This is unlike the situation at an automobile assembly plant in Kaduna, Nigeria where majority (25.5%) of the respondents was in the assembly unit.¹¹ This difference is probably due to the differences in the organization of the companies and the mix of mechanization of processes.

Safety measures taken in factory settings to protect the health of the workers included but are not limited to: pre-employment examination, periodic medical examinations, use of PPDs, routine medical/first aid services, keeping of health records, supervision of workplace, health education, good housekeeping, health and safety policy formation etc. In this study, only 19.2% of the respondents had pre-employment medical examination when they were newly employed. This is an unacceptable level. Only 57.2% of the respondents went for periodic medical examination. Among the 182 respondents that went for periodic medical examinations, 53.8% went for periodic medical examinations every 6 months, 27.5% went for periodic medical examination only when they fell sick, 9.9% went for periodic medical examination every 2 years, while 8.9% went for periodic medical examination yearly.

From the foregoing it is evident that the practice of periodic medical examination by the workers is poor. Among the 136 respondents who did not go for periodic medical examinations, 57.45% gave their reason as lack of funds, while 42.6% felt it was not necessary. This implies that the workers were not accessing periodic medical examination free, otherwise they would not have presented lack of funds as an excuse for not practising periodic medical examination. The 42.6% of the respondents who felt periodic medical examination is not necessary are probably poorly informed, hence would benefit from more health education.

Only 26.1% of the workers agreed that their employers do organise occupational safety and health programs for newly employed staff, while only 28.9% agreed that their employers do organise periodic occupational safety and health programs for staff. These figures are really low and a lack of the trainings may be the reason the practice of safety measures was poor among the workers.

Though all the respondents agreed that their employer provided PPDs, 96.5% used the PPDs, but only 15.0% of the respondents used the PPDs always. This contrasts the findings among welders in Kaduna where 34.2% used PPDs regularly.²² This low usage of PPDs could be due to several factors such as: the lack of occupational safety and health trainings for newly employed staff, lack of periodic occupational safety and health training for staff, lack of training of staff on the use of PPDs, non-provision of some particular PPDs by the management, and poor enforcement of the use of PPDs.

CONCLUSION AND RECOMMENDATIONS

This study has shown that the workers practice of safety measures was poor. There is need for further research to determine the factors that affect the practice of safety measures by these workers. This study is part of a bigger

study which has taken into cognisance these factors. The aspect of the bigger study which studied these factors is currently in the process of publication. We recommend that managements of the companies provide all the necessary PPDs, organise occupational safety and health trainings for new staff and periodic trainings for old staff and also enforce safety rules.

REFERENCES

1. Park K. Preventive and Social Medicine. 18th ed. Jabalpur: M/S Barnasidas Bhanot Publishers; 2005: 606.
2. International Labour Organization Governing Body. Decision on the third item on the agenda: Prevention of occupational diseases. Available online at http://www.ilo.org/gb/decisions/Gb17-decision/WCMS_207354/lang-en/index.htm. (Accessed on 25/11/13)
3. Rosenstock L, Cullen M, Fingerhut M. Occupational health . In : Disease Control Priorities in developing countries. 2nd ed. New York: Oxford University Press; 2006: 1127 - 1146.
4. Takala J. "Introductory report: Decent work - safe work". Paper presented at the 16th World Congress on Safety and Health, Vienna. May 27 2002.
5. Ezzati M, Lopez AD, Rodger A, Murray CJ. Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors. 1st ed. Geneva: WHO; 2004: 1651 - 1802.
6. International Labour Organization. Country profiles on occupational safety and health. www.ilo.org/safework/countries/lang-en/index.htm. (Accessed 15/12/13).
7. Occupational Safety and Health World. Country and subject links. www.sheilapantry.com/oshworld/links/index.html (Accessed 15/12/13).
8. Shukor A. An assessment of occupational hazards and ergonomic risk factors on young male workers in Malaysia. *Injury Prevention*, 2010; 16(1): A1-A289.
9. Zhang M, Zheng Y, Du X, Lu Y, Li W, Qi C, Wu Z. Silicosis in automobile foundry workers: a 29-year cohort study. *Biomedical and Environmental Sciences*, 2010; 23(2): 121-129.
10. Lilies R, Valciukas JA; Kon S, Sarkosi L, Campbell C, Selikoff I. Assessment of lead health hazards in a body shop of an automobile assembly plant. *American Journal of Industrial Medicine*, 1982; 3: 33-51.
11. Aliyu AA, Shehu AU, Singha P. Evaluation of occupational health services and hazards in a car assembly plant in Kaduna Nigeria. *Port Harcourt Medical Journal*, 2009; 3(1): 349-353.
12. Malloy EJ, Miller KL, Eisen EA. Rectal cancer and exposure to metalworking fluids in the automobile manufacturing industry. *Occup Environ Med*. 2007; 64: 244-249.
13. Lilies R, Valcinkas JA, Kon S, Sarkosi L, Campbell C, Selikoff IJ. Assessment of lead health hazards in a body shop of an automobile assembly plant. *American Journal of Industrial Medicine*, 1982; 3: 33-51.
14. Sharifian SA, Loukzadeh Z, Shojaodding -Ardekani A, Aminian O. Pulmonary adverse effects of welding fumes in automobile assembly welders. *Acta Medica Iranica*, 2011; 49(2): 98-102.
15. Attarchi M, Golabaldi M, Labbafinejad Y, Mohammadi S. Combined effects of exposure to occupational noise and mixed organic solvents on blood pressure in car manufacturing company workers. *American Journal of Industrial Medicine*, 2013; 56(2): 243-251.
16. Warner M, Baker SP, Li G, Smith GS. Acute traumatic injuries in automobile manufacturing. *American Journal of Industrial Medicine*, 1998; 34: 351-358.
17. Punnett L, Fine LJ, Keyserling WM, Herrin GD, Chaffin D. Shoulder disorders and postural stress in automobile assembly work. *Scandinavian Journal of Work, Environment and Health*, 2000; 26(4): 283-291.
18. Araoye MO, Research methodology with statistics for health and social sciences. 1st ed. Ilorin: Nathadex Publishers; 2003: 117-120.

19. Aliyu AA, Saidu S. Pattern of occupational hazards and provision of occupational health services and safety among workers of Kaduna refinery and petrochemical company limited (KRPC), Kaduna, Nigeria. *Continental Journal of Tropical Medicine*, 2011; 5: 1-5.
20. Kobrosly RW, Meliker JR, Nriagu JO. Automobile industry occupations and bladder cancer: a population based case-control study in Southeastern Michigan, USA. *Occup Environ Med*, 2009; 66: 650-656.
21. Aliyu AA, Shehu AU. Occupational hazards and safety measures among stone quarry workers in Northern Nigeria. *Nigerian Medical Practitioner*, 2006; 50(2): 42-47.
22. Sabitu K, Iliyasu Z, Dauda MM. Awareness of occupational hazards and utilization of safety measures among welders in Kaduna metropolis, Northern Nigeria. *Annals of African Medicine*, 2009; 8(1): 46-51.
23. Isah EC, Okojie OH. Occupational health problems of welders in Benin City, Nigeria. *Journal of Medicine and Biomedical Research*, 2006; 5(1): 64-69.