

Evaluation of Safety Compliance of Nigerian Small Scale Metal Fabrication Workshops

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Abstract

This study assessed the level of compliance of Nigerian small-scale metal fabrication workshops to the provisions of Occupational Health and Safety Regulations in order to ascertain the major causes of incessant accidents in this sector. Descriptive statistical tools were used to compare the safety practices in forty-four small scale metal fabrication workshops sampled from Nigeria to the Occupational Health and Safety Regulations (O.H.S.R) for metal fabrication workplace under the 'FOUR Ps' (Premises, Plant and Materials, Procedures and People). Results revealed 3.86% and 84.09% as the mean availability/usage and non-availability of appropriate protective equipment in these workshops respectively. Also, less than 34% of the workshops sampled were 50% compliant to basic workshop safekeeping practices while none was up to 70% compliant. This shows that the use of protective equipment and adherence to safety precautions in these fabrication workshops is very poor. The nonchalant attitude of the owners of these workshops toward safety practices and inadequate supervision by regulatory agencies constitute the major reasons for this observed practice, hence, the incessant workplace accidents and negative cost-time overrun in this sector.

Keywords: Accident, Fabrication, Precautions, Safety, Workshops

1.0 INTRODUCTION

The recent innovative and entrepreneurial metal fabrication activities in Nigeria have shown that the country is fast becoming an industrialised nation and the prospects of diversifying her economy in this regard should be brought into focus. Touted as the catalyst of industrial revolution in Africa, Nigeria is dominated by small and medium-sized engineering workshops with machines that perform a large range of tasks such as welding, sawing, guillotining, grinding, drilling, painting, radiography, bending, etc. These workshops are potentially hazardous environments and requires an organised approach to health and safety for optimal productivity. According to Umoh and Lezaasi (2013) and Agwu (2000), the consequences of workplace incidents on workers' productivity which invariably affects organizational productivity are so grave that fabrication workshops should be legally, morally and

socially compelled to inculcate safety culture in their workforce. Reports have shown that one worker die every fifteen seconds worldwide, six thousand workers die every day and more than two million workers die annually as a result of work related accidents and diseases (Dickson, 2015). Occupational accidents and diseases result in annual four per cent loss in global Gross Domestic Product (GDP) or about 2.8 trillion US dollars in direct and indirect cost of injuries and diseases (Victor, 2013). In Nigeria, work places are fast becoming dangerous for workers as the issue of safety and health in workplaces is being treated with so much flippancy. Investigations revealed not less than two hundred cases of industrial accidents with high rate of fatalities and billions of capital losses especially from the manufacturing sector (TNV, 2011).

The deductions from these existing records suggests that employees' safety



procedures/safety culture were either inadequate, poorly monitored or poorly communicated to the workers. It has been observed in Nigeria that many workers disregard minimum safety standards, trade unions pay less attention to the safety of their members, employers sometimes do not provide and even when they do, they rarely enforce the use of proper Personal Protective Equipment (PPE). The Ministry of labour and productivity which is saddled with the responsibility of monitoring workers welfare regrettably do not take the issue of safety compliance seriously. This explains why workplace accidents is much higher in Nigeria than other neighbouring countries. Olagbegi *et al.*, (2013) affirms that maintaining a safe working environment requires dedication and attention to safety rules or precautions. According to Umeokafor *et al.*, (2014) and Idubor *et al.*, (2013), political influence, bribery and corruption, insecurity, lack of governmental commitment, low level of education of employees, inadequate legislation, unemployment inter alia are factors responsible for violation of Occupational Safety and Health Regulations (O.S.H.R) in Nigeria.

In order to meet the different needs which are seen in the present day industrial environment which demands increased production, high efficiency, control of costs, etc., as well as compete favourably in metal fabricated projects globally, the subject of

safety, health and environment must come into play; any neglect in these aspect can prove very costly. Neglect of safety at any stage from conceptual stage to design, erection, testing, commissioning operation and maintenance of machines can result to disasters leading to loss of human life and production (Jain and Sunil, 2014). According to Hasle *et al.* (2009), Fabiano *et al.* (2004), Mendeloff and Kagey (1990) small enterprises have a higher injury risk and difficulty in the systematic prevention of accident than larger ones; this study thus assessed the level of compliance to general safety measures by small scale metal fabrication workshops in Nigeria.

2.0 Methodology

This study involved direct observation and assessment of the level of compliance of Nigerian small scale metal fabrication workshops to basic safety regulations specified by the Occupational Health and Safety Act (O.C 2012-005). In each of the states of study (Abia, Bayelsa, Benue, Enugu, Kano, Lagos, Niger, Oyo, Rivers, Kogi and Federal Capital Territory (Abuja)), four workshops were sampled and the availability/usage of ten (10) basic PPE by O.H.S.R for metal fabrication workshops (face shield, hard hat, coveralls, earmuff, eye protectors, earplugs, hand gloves, safety boots, fire extinguishers and mask respirators) were analysed using the ordinal ranking system shown in table 1 below.

Table 1: Ranking system of Appropriate PPE

D (NONE)	C (LOW)	B (AVERAGE)	A (HIGH)
0% or Inappropriate PPE	10% - 39%	40% - 69%	70% - 100%

When the PPE are inappropriate or not available, it is ranked as “D” while 10-39%,

40-69% and 70-100% PPE availability and usage are ranked as “C”, “B” and “A”



respectively. Also, the safety measures and precautions in the workshops studied were compared with thirty-six (36) basic O.H.S.R

for metal fabrication workplace under the 'FOUR Ps'- Premises, Plant and Materials, Procedures and People (Table 2).

Table 2: Basic workshop safekeeping guidelines by O.H.S.R

S/N	Workshop Safekeeping guidelines
1	Is PEP talk given to workers before commencing of work?
2	Are Equipment Screened before work
3	Is floor space clear of objects/debris?
4	Are lighting levels satisfactory/adequate for operators to utilize equipment safely?
5	Does the workshop floor have clearly outlined safe walkways?
6	Is there a preventative maintenance program in place for plant and equipment in the workshop?
7	Are there records of maintenance to plant and equipment?
8	Are there any sources of excessive noise in the immediate work area or from an external source?
9	Are people appropriately trained in plant and equipment?
10	Are all access and egress points clear of obstructions?
11	Are appropriate fire extinguishers available and visible
12	Have fire extinguishers/equipment been serviced in last 6 months?
13	Do workers know how to use fire extinguishers?
14	Are First Aid Kits readily accessible?
15	Are chemicals stored correctly (i.e. only with other compatible chemicals)?
16	Are flammable liquid cabinets at least 3m away from any potential ignition source?
17	Is there security-restricted access to store areas?
18	Are staffs aware of procedures in place for use of chemicals in the workshop?
19	Are all gas cylinders securely chained?
20	Are specialized trolleys available for moving gas cylinders?
21	Are all cylinders at least 3m away from potential ignition sources?
22	Are gas cylinders stored appropriately within the workshop?
23	Are staff appropriately trained in performing welding tasks?
24	Are welding operators provided with the appropriate PPE for the task?
25	Is there adequate ventilation for welding tasks?
26	Are there appropriate warning signs in welding areas?
27	Are there available reliable support for equipment?
28	Is smoking prohibited in the workshop?
29	Are staffs prohibited from working when sick?
30	Is wearing jewellery, loose clothing prohibited In the workshop?
31	Is usage of faulty equipment disallowed in the workshop?
32	Are there benefits for workers who ensure and obey safety measures adequately?
33	Is eating and drinking allowed in the workshop?
34	Is the temperature in the workplace always kept warm?
35	Are there robust systems for collection, handling, storage and disposal of waste available?
36	Are issues reported when they arise?

The overall number of positive remarks recorded for each workshop constitute its safety performance compliance rating. A workshop is termed safety complaint if it complies with all the workshop safekeeping guidelines of O.H.S.R, else it is non-compliant.

3.0 RESULTS AND DISCUSSION

The availability/usage of appropriate safety equipment in the metal fabrication workshops studied is shown in figure 1. The figure indicates non-availability of appropriate face shield, hard hat, coveralls, earmuff, eye protectors, earplugs, hand gloves, safety boots, fire extinguishers and mask respirators as 56.82%, 75%, 77.27%,



100%, 86.36%, 95.45%, 81.82%, 79.55%, 95.45% and 100% respectively while the respective average availability/usage of these equipment stood at 15.91%, 6.82%, 4.55%, 0%, 0%, 0% 2.27%, 9.09%, 0% and 0%. This implies a mean availability/usage of appropriate protective equipment is 3.86% while 84.09% constitutes the equipment's average non-availability. Figure 2 revealed that none of the workshops investigated was 100% safety compliant (none had all the 36 O.H.S.R for workshop safekeeping positive), less than 3% was 66.7% complaint (24 positive remarks), approximately 34% of the

workshops was 50% compliant (18 to 24 positive remarks) while no workshop was less than 33% complaint. This clearly shows that the use of protective equipment and adherence to safety precautions in these fabrication workshops is very poor. Almost all the major PPE were found to be available at a low percentage. The nonchalant attitude of the owners of these workshops toward safety and inadequate supervision by the regulatory agencies in Nigeria is responsible for this anomaly. These explains the incessant accident as well as negative cost-time overrun in this sector.

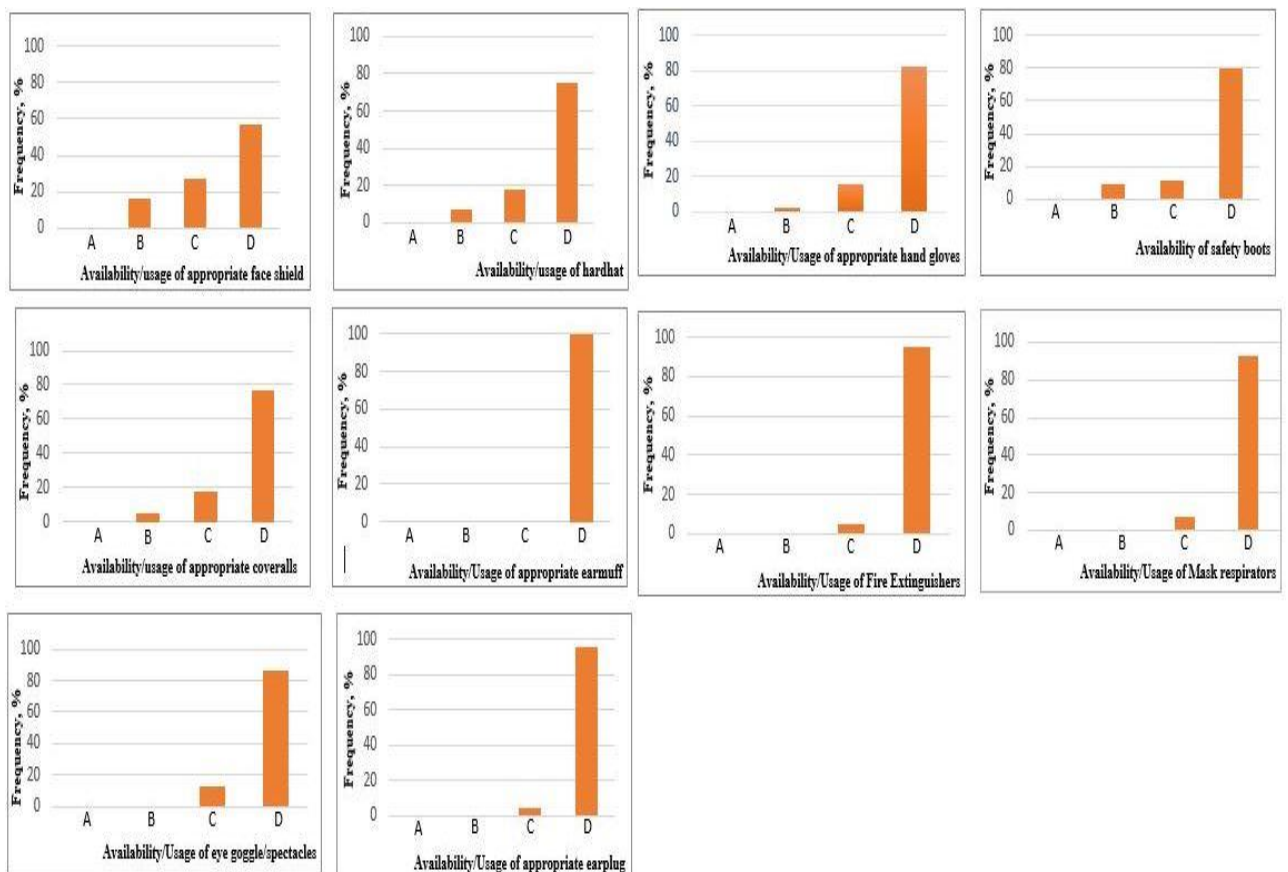


Figure 1: Availability/Usage of Appropriate Personal Protective Equipment (PPE)



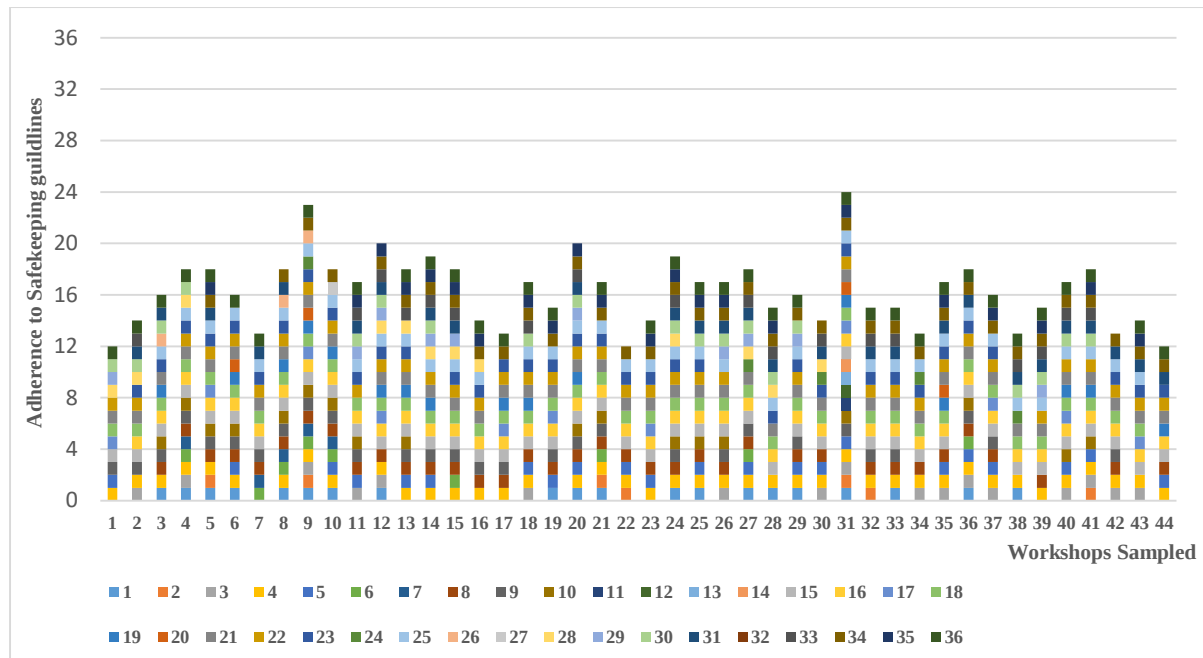


Figure 2: Accumulated performance of the workshops to Safety Precautions

4.0 CONCLUSION

This study revealed 84.09% and 3.86% as the mean availability/usage and non-availability of safety equipment in Nigerian small scale metal fabrication workshops. In addition, less than 35% of workshops sampled were 50% compliant in basic workshop safekeeping practices while none was 70% compliant. This means that safety practices in Nigerian small scale metal fabrication workshops is poor/substandard, hence, the incessant workplace accidents in this sector. Sensitization should be given to workshops on the need to make safety their priority, regular inspection of workshops by regulatory bodies should be improved, also adequate and intensive training should be given to metal fabrication workers so as to help improve the state of safety in these workshops.

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