Hazard Control Needs Assessment of Roadside Welders in Rivers East Senatorial District Rivers State

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Abstract
The purpose of the study is to assess the hazard control needs assessment of roadside Welders in Rivers East Senatorial District, Rivers State. The population of the study comprises all Road Side Welders in the LGAs in Rivers East Senatorial District. To achieve this purpose descriptive survey design was employed and self structured validated questionnaire was used to collect data from 912 Roadside welders from Rivers East Senatorial District, Rivers State. The instrument for data collection was tagged Hazard Control Needs Assessment of Roadside Welders Questionnaire (HCNARWQ) with a reliability index of 0.76. This was modified to suit the study. The data collected were analyzed using Simple percentages and frequency tables for the research questions, while Chi-square (χ^2), and was used to test the hypotheses at 0.5 alpha level of significance. The findings of the study showed that Roadside welders in Rivers East Senatorial District, Rivers State have equipment, knowledge and hazard control practice needs. More so, demographic variables such as age, educational status, training and location of workshop had influence on hazard control measures used by roadside welders. Finally it was concluded that knowledge on hazard of Roadside welders has influenced on hazard control equipment and practices. It was recommended that periodic inspection of the roadside welder's workplace by the Ministry of Labour and productivity through its agencies will build consciousness on the welders, reduce the impact of hazards, enhance performance, prevent accident and injury hence maintain longevity of life while at workplace.

***Key words**: Hazard control, needs, assessment, road side welders*

Introduction

Work is the key elements to progress and achievement in human beings. Productive life is extremely important for every individual, not only in the income it brings essentially to maintain a reasonable standard of living but also makes them happy and feel fulfilled and enjoy most aspect of it (Asogwa, 2000). Hence, involuntary cessation of work through injury, illness or disabilities acquired from the work comes as a great shock and may cause considerable distress and anxiety. Government's institutions and organizations including occupational health practitioners worldwide are not relenting over the issue of occupational health and safety however. International Labour Organization (ILO) (2003) postulated that in spite of policies, technologies and scientific

development to solve the menace of workplace hazards, many have continued to record high rate of work related injuries and diseases. It was revealed that above 335,000 fatalities are recorded averagely in a year out of about 250 million industries worldwide.

Hazard is anything, condition or situation that has the potential to cause accident, injury, illness or even death. An occupational hazard is seen as a work substance process or situation that predisposes to or itself causes accident or diseases (Asuzu, 1994 in Achalu, 2000). Occupational health hazard accounts for the causes of occupational diseases and accident. Tripathy, Panda and Sunakar (2008) defined hazards as a situation which poses a level of threat to life, health, property or environment" it is also describe as something that can cause harm if not controlled. Moore (2006), opines that it is a substance or material including a hazardous substance which is capable of poisoning an unreasonable risk to health, safety and properly.

Oluwagbemi (2003) perceived hazard as a substance, objects and arts such as emission or commission and situation that poses human being to dangers within the environment. Workplace hazards are common in all parts of the world, most especially in the developing countries like Nigeria where there is in adequate recognition of causes of hazards poor record keeping and reporting mechanism.

Every occupation has it's own hazard and they are responsible for most cases of accidents, illness and disease in many work places. Sabitu, Illiyasu and Dauda (2009) stated that by WHO (1998) report about 250 million cases of work –related injuries per year worldwide are being contributed by non-industrial welding especially in developing countries including Nigeria.

Welding work involves cutting and joining metal parts using flame or electric arc and other sources of heat. There are varieties of these processes but the commonest types in Nigeria are the gas welding by the use of oxyacetylene flame the product of a reaction between calcium carbide and water and pure Oxygen). The two gases are combined in a nozzle and ignited, producing a flame reaching temperatures of $3100^{o}C$ which is then used for cutting and welding. The electric arc welding involves the use of electricity (WHO, 2008). Occupational hazards involved in the gas welding process include fire explosion and personal injury. If proper precautions are not taken such hazards, can cause injuries to the face, eyes and could lead to life-long disability, knowledge of occupational health problems is important in its existent since majority of them are self – employed without formal education.

A welder or welder operator is a tradesman who specializes in welding materials together. The term welder refers to the operator; the machine is referred to as the welding power supply. The material to be joined can be metals (such as steel, aluminum, brass, stainless) or varieties of plastic or polymer. Welders typically need to have good dexterity and attention to detail as well as some technical knowledge about material being joined and best practices in the field (Aguma- Acon, 1999).

The majority of urban informal sector workers in Nigeria live in slums, and they lack basic health and welfare services and social protection. They work in an unhealthy and unsafe work environment. For most informal sector operators, their home and workplace are one and the same place. Vulnerability to diseases and poor health result from a combination of undesirable living and working conditions. Many of the small-scale enterprises like the welders operate in ramshackle structures, lack sanitary facilities or potable water, and have poor waste disposals.

Park (2011) stated that an industrial worker may be exposed to five types of hazards, depending upon his occupation, these includes the followings; Physical hazards, Chemical hazards, Biological hazards, Mechanical hazards and Psychosocial hazards. However, Achalu (2002) and Oluwagbemi (2007) are in agreement that hazards can be classified into; Physical hazard, Biological hazard, Ergonomical and Psychological hazard. In their views, physical hazard are those hazards that can be felt or perceived on exposure. The common example includes heat; noise light, high and low

pressure, medical vibration, x-rays ionizing radiations.

Park (2009) submitted that needs assessment is carried out when there is a deficiency in health of person's community, group of persons or organization for preventive, curative, maintenance or for eradication measures to improve the wellbeing of such group or persons. Needs assessment as seen by Kizlik (2010) is a systematic process for determining and addressing needs or "gap" between current conditions and desired conditions or "wants". The discrepancy between the current condition and wanted condition must be measured to appropriately identify the need. The need can be a desire to improve current performance or to correct a deficiency.

Fulgham and Shaughnessy (2008) asserted that a needs assessment is a part of planning processes, often used for improvement in individuals education, training, organization or communities, it can be an effective tool to clarify problems so that and identity appropriate interventions or solution, by clearly identifying the problem finite resources can be directed towards developing and implementing a feasible and applicable solutions.

Welders are exposed to excessive noise levels excessive heat and cold, electromagnetic fields, laser light and radiation (Park, 2011). Canadian Center for occupational Health and Safety (2011) stated that welding arc give off radiation over a broad range of wave length from 200-1400mm. This includes ultraviolet radiation (200-400mm), visible light (400-700nm) and infrared radiation (200-140nm), certain types of ultraviolet radiation can produce an injury to the surface and mucus membrane of the eye called 'arc eye', welder's eye arc 'arc flash'.

Also the brightness of the weld arc can also lead to the optic condition, arc eye or photokeratitis in which ultraviolet light causes the inflammation of the cornea and can burn the retina of the eyes. Apart from producing arc eye, long term exposure to ultraviolet light can produce cataracts. Visible light from welding processes can overwhelm the ability of the Iris of the eye to close sufficiently and rapidly enough to limit the brightness of the light reaching the retina the result is that the light is temporarily blinding and fatiguing to the eye. Blunt and Balchin (2005) submitted that many processes produce fumes and various gases most commonly carbondioxide and ozone that can prove dangers if ventilation is inadequate and breathing in those gases and fumes is very dangerous.

Chemical substances from fumes that affect welders, welding can create fumes which are a complex mixture of metallic oxides, silicates and fluorides. Fumes are formed when metals or other materials such as flux or solvents are heated above its boiling point and its vapours condense into very fine particles (solid particulates). Welding fume normally contain oxides of the materials being welded and of the electrodes being used. If the metal has a coating or point, these too can be combined with the heat and become part of the fumes. Sometimes it may be flammable and combustible liquids, compressed gases and asbestos (Prabbakara, 2002).

Ergonomic Hazards result from carrying some equipment. Many injuries to welders are the result of strains, sprains and work-related musculoskeletal disorders. Welders often have to: lift or move heavy objects, work in awkward positions for long periods of time handle and hold heavy welding guns and perform repetitive motions.

Biological hazards are living organisms which poses danger in the work environment and result to disease when workers are exposed to them. They include bacteria, viruses, protozoa, helminthes, fungi and toxins of certain plants and animals some of the diseases associated with biological hazards includes tuberculosis, hepatitis B, antrax, tetanus, cholera worm, infestation, to mention but a few (Park, 2011). Welders are exposed to these biological hazards when there is poor housekeeping or hygiene e.g. not cutting of grasses and sweeping of the workshop.

Mechanical Hazards are hazards resulting from the use of machineries and appliances in the cause of production in the working environment e.g. producing of pointed objects, welding, electric

shock, trips and falls. Also this result from consistent contact with material used in welding that causes injury or wound as a result of not using personal protective equipment (PPE), faulty machine, wrong use of equipment and unguarded machine.

Psychosocial Hazards are feelings of ill health to shock that result from overworking. Work that demands deadline may contribute to stress as the welder want to conclude the job and handover to the owner. In addition some welders may be required to work shift or extend work days which can have health effects (Gupta, 2013). Psychological problems could be traced from workers home or emanate from the work environment and affect his emotion, these include stress, boredom, insecurity at work, work pressure, underutilization of skills, poor interpersonal communication, violence, poor remuneration, lack of social support at home and in the work place.

In a different view Asuzu (2002) ascertained that the understanding of the practice of hazard control among workers requires adequate knowledge of the relationship and interaction between work and health, however both work and health have negative and positive effect on each other.

Effective hazards control practice endeavours to minimize or even totally eliminate the mutual negative effects while promoting positive effects among workers, the work processes and the environment (Rogers, 2003). Therefore, the need to place focus on the control of workplace hazards and the enrolment as a means of safeguarding workers and conserved natures variable for the benefit of both present and future generations is of necessity and pertinent for enhancement of life of individual in the society.

Statement of the Problem

Welders are particularly observed to be prone to occupational hazards, which cause many health problems like impaired pulmonary functions, chronic bronchitis and intestinal disorder as a result of inhalation of gasses, cancer of the skin lung diseases, musculoskeletal diseases, wounds and burns.

Welding work involves cutting and joining metals parts using flame or electric arc and other sources of heat, this sometimes leads to fire explosion, electrocution, life long disability if proper precautions are not taken, assessment of the hazard control equipment, practice and knowledge of this roadside welders is pertinent in its existence since majority of them are self employed without formal education. Unsafe and unhealthy work practices such as lack of use of PPES have been observed among welders especially roadside welders in Nigeria.

Aims and Objectives of the Study

The aim of this study is to assess the hazards control needs of roadside welders in Rivers East Senatorial District, Rivers State. The study intends to achieve the following objectives.

1. To ascertain the hazard control equipment needs of roadside welders in Rivers East Senatorial District.
2. To identify the hazard control practices of roadside welders.

Research Questions

The following research questions are posed to guide the study.

1. What are the hazard control equipment available to the roadside welders in Rivers East Senatorial District, Rivers State?
2. What are the hazard control practices of the roadside welders?

Research Hypotheses

The following hypotheses are stated to guide the study and were tested at 0.05 alpha level of

significance.

1. There is no significant difference in the hazard control equipment needs of the roadside welders with regard to location of workshop, educational status, age and training.
2. There is no significant difference in the hazard control practices of roadside welders with regard to location of workshop, educational status, age and training.

Methods

Descriptive survey design was used in this study. This design is considered suitable since it involves gathering sample from a large population. Descriptive survey design is concerned with the collection of data for the purpose of interpreting and describing conditions, attitudes and on going process.

A sample size of One Thousand Eight (1008) respondents was used for the study. Non proportionate sampling technique was used to select two wards from each LGAs and 72 roadside welders from each selected ward using accidental sampling techniques.

The instrument for data collection was a self-structured questionnaire titled: Hazard Control Needs Assessment of Roadside Welders questionnaire (H.C.N.A.R.W.Q).The questionnaire comprises section A and B, section A deals with the demographic data of the respondents while section B deals with the variables under study. The instrument was validated by experts in the field of Health Education.

The reliability of the instrument was determined through test-retest, 30 copies of the instrument was administered to 30 welders in Port Harcourt local government area after two weeks the same instrument was re-administered to the same respondents, the result of the two test was correlated using Pearson Product Moment Correlation. A reliability Co-efficient of 0.76 was obtained, the instrument was therefore considered reliable.

Data collected were analyzed using the descriptive statistics of frequency counts and percentages for demographic data and research question while inferential statistics of chi-square (x^2), was used to test the hypotheses at 0.5 alpha level of significance.

Results

Research question 1

What are the hazards control equipment available to roadside welders in Rivers East Senatorial districts?

Table 1: Frequency distributions showing the hazards control equipment available to the roadside welders

Hazards control equipment	Yes Availability	No
	F- Available %	F Not available %
1. Helmet	727 (80.2%)	179(19.8%)
2. Face shield	758(83.5%)	150(16.5%)
3. Nasal mask	653 (72.0%)	254(28.0%)
4. Safety boot	783(86.3%)	124(13.7%)
5. Eye goggle	843(93.0%)	63(7.0%)
6. Coverall	772(85.1%)	135(14.9%)
7. Hand gloves	797 (88.0%)	109(12.0%)
8. Ear plugs and muff	573(63.2%)	333(36.8%)
9. Fire extinguisher	606(68.2%)	283(31.8%)

10. Ladder	431(86.4%)	68(13.6%)
Total	80.59%	16.23%

Table 1 shows the hazards control equipment available to roadside welders in Rivers East Senatorial district. Two hundred and fifty-four representing 28.0% have nasal masks not available, 333 representing 36.8% have ear plugs and muff needs, 283(31.8%) fire extinguisher not available, 135(14.9%) coverall not available, 150(16.5%) face shield not available, 179(19.8%) helmet not available, 109(12.0%) hand gloves not available, 124(13.7%) safety boot needs while 63(7.0%) have eye goggle not available.

Ho_1 : There is no significant difference in the hazard control equipment needs of roadside welders with regards to educational status.

Table 2: Chi-square Analysis showing the significant difference in hazards control equipment (HCE) needs of respondents with regards to educational status

Cal χ2-value	P- value	df	Alpha level	Decision
54.806	0.000	3	0.05	significant

The null hypothesis states that there is no significant difference in hazards control equipment need with regards to educational status A chi-square test for independence with Yates continuity correction indicated significant difference between educational status and hazards control equipment needs $p<0.05$ ($\chi2=54.806$; df=3;p=0.000). The null hypothesis is therefore rejected

Research question 2
What are the hazards control practices of road side welder in Rivers East Senatorial district?

Table 3: Frequency distributions showing the hazards control practices of respondents

Hazards control practices*	**Practices**			
	Always F(%)	Occasionally F(%)	Rarely F(%)	Never F(%)
1. Arrangement of material used in the workshop	689(76.4)	171(19.0)	36(4.0%)	6(0.7)
2. Sharp and dangerous materials well-guarded	698(77.2)	163(18.0)	28(3.1)	15(1.7)
3. Use of fire extinguisher, alarm etc	389(43.1)	206(22.8)	151(16.7)	156(17.3)
4. Invite environmental officer for inspection	180(20.1)	269(32.3)	159(17.6)	266(29.8)
5. Monthly general health assessment	210(23.3)	319(35.4)	170(18.9)	202(22.4)
6. Attend health talks on Hazards control	192(21.5)	281(31.5)	183(20.5)	235(26.4)

7. Maintain cleanliness: sweeping and weeding	638(71.0)	188(20.9)	49(5.5)	23(2.6)
8. Correct tool for each work	669(75.0)	126(14.1)	72(8.1)	25(2.8)
9. Display warning signs at restricted areas	436(48.7)	270(30.1)	90(10.0)	100(11.2)
10 Attend hazard control training	271(30.2)	239(26.6)	172(19.2)	216(24.1)
11. Replace faulty equipment	615(68.7)	181(20.2)	76(8.5)	23(2.6)
12. Use waste bin and trash basket	600(67.0)	131(14.6)	69(7.7)	96(10.7)
13. Supervise apprentice	618(69.2)	179(20.0)	66(7.4)	30(3.4)
14. Work in ventilated workshop	654(72.9)	148(16.5)	57(6.4)	38(4.2)
15. Work all days of the week	343(38.2)	256(28.5)	155(17.3)	143(15.9)
16. Use personal protective equipment	628(70.1)	256(28.5)	155(17.3)	143(15.9)
Total	54.5375%	23.6875%	11.7625%	11.98125%

Table 3 shows hazards control practices of respondents.689(76.4%) of the respondents always arrange materials to be used very well in the workshop, 171(19.0%) occasionally, 36(3.0%) rarely, 6(0.7%) never arrange material to be used very well in the workshop. 698(77.2%) always ensure that sharp and dangerous machine parts are well guarded, 163(18.0%) occasionally, 28(3.1%) rarely, 15(1.7%) never ensure that sharp and dangerous machine parts are well guarded. 389(43.1%) always use fire extinguisher, alarm etc. in case of fire out breaks, 206(22.8%) occasionally, 151(16.7%) rarely, 156(17.3%) never use fire extinguisher, alarm etc. in case of fire outbreaks.. 180(20.1%) always invite environmental officers for hazards control inspection, 289(32.3%) 0cassionally, 159(17.8%) rarely, 266(29.8%) never invite environmental officers for hazards control inspection. 210(23.2%) always go for monthly general health assessment, 319(35.4%) occasionally, 170(18.9%) rarely, 202(22.4%) never go for monthly general health assessment. 192(21.5%) always go for health talks on hazards control needs, 281(31.5%) occasionally, 183(20.5%) rarely, 235(26.4%) never go for health talks on hazards control needs. 638(71.0%) always maintain cleanliness in the workshop by sweeping and weeding the surrounding, 188(20.9%) occasionally, 49(5.5%) rarely, 23(2.6%) never maintain cleanliness in the workshop by sweeping and weeding the surrounding.669(75.0%) always use correct tool for each work in the workshop, 126(14.1%) occasionally, 72(8.1%) rarely, 25(2.8%) never use correct tool for each work in the workshop. 436(48.8%) always display warning signs at restricted areas in the workshop, 270(30.1%) occasionally, 90(10.0%) rarely, 100(11.2%) never display warning signs at restricted areas in the workshop. 271(30.2%) always attend hazards control training and retraining programmes, 239(26.6%) occasionally, 172(19.2%) rarely, 216(24.1%) never attend hazards control training and retraining programmes. 615(68.7%) always replace faulty equipment in the work place, 181(20.2%) occasionally, 76(8.5%) rarely, 23(2.5%) never replace faulty equipment in the work place. 600(67.0%) always use waste bin trash baskets in the workshop, 131(14.6%) occasionally, 69(7.7%) rarely, 96(10.7%) never use waste bin trash baskets in the workshop. 618(69.2%) always supervise their apprentice in the work shop, 179(20.0%) occasionally, 66(7.4%) rarely, 30(3.4%) never supervise their apprentice in the work

shop. 654(72.9%) always work in ventilated workshop, 148(16.5%) occasionally, 57(6.4%) rarely, 38(4.2%) never work in ventilated workshop. 343(38.2%) always work all the days of the week, 256(28.5%) occasionally, 155(17.3%) rarely, 143(15.9%) never work all the days of the week. 628(70.1%) always use personal protective equipment in the workshop, 180(20.1%) occasionally use personal protective equipment in the workshop, 66(7.4%) rarely, 22(2.5%) never use personal protective equipment in the workshop.

Ho_2: There is no significant difference in the hazard control practices of roadside welders with regards to location of workshop.

Table 4: Chi-square analysis showing difference in hazards control practices with regards to location of workshop.

Cal $\chi 2$-value	P- value	df	Alpha level	Decision
22.05	0.00	3	0.05	significant

A Chi-square test for independence indicated significant difference between location of workshop and hazard control practices ($\chi 2=22.05$, df=3) $p<0.00$. The null hypothesis which states there is no significant difference in hazard control practice of respondents with regards to location of workshop is rejected.

Discussion of findings

The result of findings on hazard control equipment needs of roadside welders with regards to educational status in table 1 and 2 showed that there is difference in hazard control equipment needs of roadside welders with regards to educational status.

This is supported by Achalu (2002) who viewed that workplace education through health education is a panacea to handling of hazards in work processes, he suggested that the use of information to persuade workers employees and management to protect, promote health and prevent diseases is necessary, however when workers have knowledge about the dangers in their work environment, they are less likely to be victims, but beyond that, a positive attitude and productive measures based on pre-knowledge of the workplace hazard will not only protect-them from hazard but minimize their exposure to it.

Furthermore, the data from table 3 and 4 revealed that location of workshop have influence in hazard control practices. This is supported by the idea of Aguma –Acon (1999) that welders belongs to the informal sectors, informal sector workers in Nigeria live in slums and in most rural areas and they lack basic health and welfare services and special protection, they work in an unhealthy and unsafe work environment for most informal sectors operators, their home and work place are one and the same place. Many of the small-scale enterprises like the welders operate in ramshackle structures, where they can afford the payment for rent age of workshops. Also, those in the urban have the opportunity to attend seminars, workshops and retraining programmes from government and NGOs.

Conclusion

Based on the data and the findings, it was concluded that; Roadside welders needs hazard control equipments in their various work shop also demographic characteristics such as age, educational status,

training, location of workshop has influence on knowledge, practice and hazard control equipment of roadside welders in Rivers East Senatorial District, Rivers State.

Recommendations

Based on the findings of this study the following recommendations are hereby made:

1. Ministries in charge of labour and productivity from time to time should go for inspection of the roadside welders workshop to ascertain the equipment available.
2. Through mass media welders should be encourage to go for fresher training to update their knowledge especially those without formal education and those with first school leaving certificate (FSLC).
3. Welders should be encouraged to attend seminars and workshop on the use of tools and equipment in order to prevent accident, injury and even death.
4. The roadside welders are encouraged to use the appropriate personal protective equipment or wears for any job to be perform.
5. Those in rural communities are encouraged to attend training programmes to enhance knowledge and productivity.

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