

Socioeconomic Factors Affecting Attitude Toward Ocular Injuries Among Welders in Owerri, Nigeria

*Azumah Y.C.¹, Osuji C.D.², Esenwah E.C.¹, Agu G.C.³, Nwala O.R.⁴, Bazuaye K.N.⁵

¹Department of Optometry, Federal University of Technology, Owerri, Nigeria

²Department of Optometry, Madonna University Elele, Nigeria

³Department of Optometry, Imo State University, Owerri, Nigeria

⁴Department of Optometry, Abia State University, Uturu, Nigeria

⁵Department of Optometry, University of Benin, Benin-city, Nigeria

*Correspondence Author: youngazuamah@yahoo.com

ABSTRACT

This study was carried out in Owerri municipal, Southeastern Nigeria to determine the socioeconomic factors affecting the attitude of welders toward ocular injuries. One hundred male welders with a mean age of 32.17 ± 9.1 were interviewed with the use of questionnaires. Information obtained from the welders revealed that 48% had primary education, 48% had secondary education and 2% had tertiary education. The income of the welders per week showed 27% earning below ₦2000, 59% earned between ₦2000 and ₦5000, and 14% earned above ₦5000 weekly. Upon occurrence of an ocular injury, 34% of the welders visited the hospital, 50% embarked on self-medication while 16% opted for lay referral. While 22% used protective eye equipment when working, 78% did not. On the impact of ocular injury on their income, 79% said there was a significant financial impact while 21% said there was no impact on their income. Adequate education and enlightenment of welders and the general public toward proper prevention and management measures

of ocular injuries at workplace was recommended.

Keywords:

Ocular injuries; welders; socioeconomic factors; income; education.

INTRODUCTION

Welding is the act of joining materials together by heating the surfaces to the point of melting and pressing or hammering them together. It is the union of pieces of metal at joint faces by various processes such as heat, pressure, or both¹. The materials to be joined can be metals (such as steel, aluminium, brass, stainless steel etc.) or varieties of plastic or polymer. There are 200 types of welding methods some of which include oxy-fuel gas welding, electric welding, resistance welding, plasma arc welding, electron beam welding, and metal arc welding. The most common welding technologies used in industries particularly the small scale industries are oxy-fuel gas welding and

electric arc welding². Welders typically need to have good dexterity and attention to detail, as well as some technical knowledge about the materials being joined and best practices in the field. Welding, without the proper precautions appropriate for the process, can be a dangerous and unhealthy practice. However, with the use of new technology and proper protection, the risks of injury and death associated with welding can be greatly reduced³. Because many common welding procedures involve an open electric arc or flame, the risk of burns is significant. To prevent this, welders wear personal protective equipment in the form of heavy leathergloves and protective long sleeve jackets to avoid exposure to extreme heat and flames. Additionally, the brightness of the weld area leads to a condition called arc eye in which ultraviolet light causes the inflammation of the cornea and can burn the retinas of the eyes. Full face welding helmets with dark face plates are worn to prevent this exposure, and in recent years, new helmet models have been produced that feature a face plate that self-darkens upon exposure to high amounts of UV light⁴. To protect bystanders, opaque welding curtains often surround the welding area. These curtains, made of a polyvinyl chloride plastic film, shield nearby workers from exposure to the UV light from the electric arc, but should not be used to replace the filter glass used in helmets³. Welders are also often exposed to dangerous gases and particulate matters. Processes like flux-cored arc welding and

shielded metal arc welding produce smoke containing particles of various types of oxides, which could lead to the medical condition known as metal fume fever⁵. The size of the particles in question tends to influence the toxicity of the fume. Additionally the processes also produce fumes and various gases, especially carbon dioxide and ozone that can prove dangerous if ventilation is inadequate⁵. Furthermore, because the use of compressed gases and flames in many welding processes pose high risk to explosion, fire precautionary measures which include limiting the amount of oxygen in the air and keeping materials away from the work place may become necessary⁶. Welding fumes have also been reported to affect the kidney and the reproductive organs leading to reduction in sperm count and fertility⁷.

Ocular injuries which can result from the art of welding include corneal abrasions, cornea foreign bodies, redness of the conjunctiva, contusions, bruises, eyelid lacerations and ecchymosis⁸. These injuries can cause severe pain and discomfort and can lead to total or partial blindness. Socioeconomic factors represent the social and economic experiences and realities that help shape an individual's personality, attitudes and life-style. Some of these factors include education, income, occupation, place of residence, culture, ethnicity and religion⁹. The level of education of a person can contribute to his social growth

and productivity. It can lead to increased earnings, which in turn can contribute to an improved quality of life¹⁰. The welder who is educated is expected to take the necessary precautions at his work place to prevent the occurrence of injuries. In Nigeria, welders are not known to be high income earners when compared to other occupations such as doctors, lawyers and engineers. This puts them in a lower socioeconomic status. However, the place of work residence plays a role on the person's level of income. For example, welders working in urban centers and for big companies tend to have a higher income than those working in the rural centers. His level of education and income can affect his attitude toward treatment of injuries with regards to self-medication and going to a hospital to seek professional treatment. This study was carried out to determine the socioeconomic factors associated with injuries among welders plying their trade in Owerri municipal, an urban center in Southeast Nigeria and how it influences their attitude toward the prevention and management of the injuries. Data generated from this study will help policy makers to develop guidelines on the regulation of welding operations in the country.

MATERIALS AND METHODS

This study was carried out in Owerri municipal, the capital city of Imo state in Southeast Nigeria. The people of Owerri are

Igbo speaking and predominantly Christians. There are also residents from other states of the country who are from other tribes like Yoruba, Ikwerre, Hausa, Efik etc. There are also Muslims living in Owerri, most of whom are from the Northern part of Nigeria. The educational background of the people is quite good as the city has a high number of academic institutions from the nursery/primary level to the tertiary level. The research design of this study was descriptive aimed at ascertaining the socioeconomic status of welders with regards to injury occurrence who operate in the city. Questionnaires were given to the welders at their various workshops to fill out. Only welders who gave an informed consent and satisfied the inclusion and exclusion criteria were used for this study. The results were compiled and represented in tables.

RESULTS

A total of 100 welders all of whom were males were interviewed for this research. From table 1, information received on the age of the welders revealed that 61% were between the ages of 18 to 30 years; 31 to 40 years, 28% and 61 to 70 years, 1%. The marital status of the welders showed that 20% were married, 76% were single and 4% were widowers. The table also showed that 98% were Christians while 2% were Muslims. On educational attainment, the table showed that 48% stopped at primary education, 48% had secondary education and

2% had tertiary education. Table 2 showed that 33% of the welders worked for 8 hours a day, 32% worked for 9 hours a day and 35% worked for 10 hours a day. Also from the table, 31% had between 1 and 5 years working experience; 40% had 6 to 10 years working experience, 14% had 11 to 20 years working experience and 15% had a working experience of above 20 years. The income of the welders per week showed 27% earning below ₦2000, 59% earned between ₦2000 and ₦5000, and 14% earned above ₦5000 weekly. Table 3 showed that 34% of the welders visited the hospital upon occurrence of an ocular injury; 50% embarked on self-medication while 16% opted for lay referral. From the table, while 22% used protective eye equipment when working, 78% did not. When questioned on the impact of ocular injury on their income, 79% said there was a significant financial impact while 21% said there was no impact on their income.

DISCUSSION

Welding in Nigeria is a male dominated profession hence, all the welders interviewed in this study were males as no female welder was found in the course of the study. This is not surprising as the job is physically challenging and can be dangerous. Women generally tend to go for less physically challenging jobs. Majority of the welders (61%) were below 30 years. Only 11% of all

the welders interviewed were above 40 years. This showed that welding is generally a job for the youth who are physically able to carry out the task. As they get older, they retire to supervisory roles and engage younger workers to do most of the work. Similar studies^{8,11,12} have also shown that physically demanding jobs are dominated by males who are below 40 years. In Nigeria, welders learn their trade mainly through apprenticeship and therefore most of them do not go beyond secondary education. Many drop out from school and do not have a strong educational foundation to be able to make wise decisions with regards to prevention and management of injuries at work. Only 22% of the welders wear protective eye equipment when carrying out their work. Some of them have goggles in their work place but most times they find it easier and more convenient to go straight to work unprotected. Isah and Okojie¹³ reported that only 35.9% of welders use personal protective equipment. Sani,*et al.*,¹⁴ reported that 44.2% of construction workers in Northern Nigeria do not wear their protective equipment at work. They tend to take for granted the severity of injuries that can occur when protective eye equipments are not worn. When injuries do occur, only 34% of welders from this study reported that they go to the hospital to seek professional treatment; 50% embark on self-medication which involves going to the pharmacy to buy drugs that they feel will take care of the problem. 16% go through the lay

referral system whereby they will first complain to their family members or neighbors who will tell them to apply one drug or the other. If that doesn't work they will recommend traditional healers or spiritual healers. When the problem has probably become worse, they will then go to the hospital as a last resort. By this time, it might be too late to save the eye from total or partial blindness. Ajayi and Omotoye¹⁵, in their study reported 6 cases of blindness from cornea opacities as a result of injuries at work by welders. These cases of blindness can be prevented if the welders were to seek professional treatment in the hospital or eye clinic. At the early stages of an injury, the severity is less and so will be the financial cost. This would be the best time for the welder to seek medical attention bearing in mind that their income is not quite high. But because they seek medical attention as the last resort after trying out other options, the problem must have gotten worse and the financial cost will increase. This is why 79% of the welders in this study said that the cost of managing ocular injuries have an impact on their income. Education and enlightenment campaigns need to be intensified on welders and the general public on the need for proper attitude toward prevention and management of ocular injuries at work place.

REFERENCES

1. Lyndon G.S. (1983). Welding and thermal cutting. In: Encyclopedia of Occupational Health and Safety. 3rd ed. Geneva: ILO.
2. Vimesh-Jani T. and Mazumunda V. (2004). Prevalence of respiratory morbidity among welders in unorganized sector of Baroda City. *Indian J Occup Environ Med.*, 8:16–21.
3. Guidotti T.L., Lappi V.G. and Laggard S. (1992). *Environmental and Occupational Medicine; Hazards of welding technologies.* 2nd ed. London: Little Brown and Company.
4. Sjögren B. (1994). *Effects of gases and particles in welding and soldering.* 3rd ed. St Louis: Mosby Year Book Inc.
5. Jafari A.J. and Assari M.J. (2004). Respiratory effects from work-related exposure to welding fumes in Hamadan, Iran. *Arch Environ Health*, 59:116-20.
6. Ibfelt E., Bonde J.P. and Hansen J. (2010). Exposure to metal welding fume particles and risk for cardiovascular disease in Denmark: a prospective cohort study. *Occupational and Environmental Medicine*, 67(11):772–777.
7. Loukzadeh Z., Sharifian S.A., Aminian O. and Shojaoddiny-Ardekani A. (2009). Pulmonary effects of spot welding in automobile assembly. *Occupational Medicine*, 59(4):267–269.

8. Fiebi B. and Awoyesuku E.A. (2011). Ocular injuries among industrial welders in Portharcourt, Nigeria. *Clinical ophthalmology*, 5(4): 261-263.
9. Abanobi O. (2010). *Core Concepts in Epidemiology and Public Health Practice: A Quick Reference Manual*. Owerri: Opinion Research and Communications Inc.
10. Kayode R.A., Ademola O.A., Oluwole A.B., Oladele A.A., Sarafadeen K.S. and Funsho Y. (2014). Effect of health education intervention on the awareness and use of personal protective equipments among small scale electric arc welders in Ilorin, Nigeria. *Indian J Occup Environ Med*, 18(1): 3–8.
11. Davies K.G., Asana U., Nku C.O. and Osim E.E. (2007). Ocular effects of chronic exposure to welding light on Calaber welders. *Nigeria Journal of physiological science*, 12(2): 794-859.
12. Ajayi I.A., Adenike O.A., Charles O.B., Oluwatoyin H.O., and Omotoye O.J. (2011). Awareness and utilization of protective eye device among welders in southern Nigeria Community. *Annals of African medicine*, 10(4): 294-299.
13. Isah E.C. and Okojie O.H. (2006). Occupational health problems of welders in Benin City, Nigeria. *J Med Biomed Res*, 5: 64–69.
14. Sani, S.G., Azuamah Y.C., Amadi A.N., Esenwah E.C., Agu G.C. and Nwala O.R. (2014). An investigation into the personal protective equipment used by construction workers in Northern Nigeria. *International Journal of research*, 1(10): 689-693.
15. Ajayi, I.A. and Omotoye, O.J. (2012). Pattern of eye disease among welders in a Nigeria community. *Africa Health science*, 12(2): 210-216.

TABLES

Table 1: Characteristics of welders

Age Distribution	Frequency	%
18 – 30	61	61
31 – 40	28	28
41- 50	6	6
51 – 60	4	4
61 – 70	1	1
Marital Status		
Married	20	20
Single	76	76
Widower	4	4
Separated	-	-
Religion		
Christian	98	98

Muslim	2	2
Educational Attainment		
Primary	48	48
Secondary	48	48
Tertiary	4	4

Table 2: Work Information of welders

Work duration (hours)	Frequency	%
8am – 4pm (8hrs)	33	33
8am – 5pm (9hrs)	32	32
8am – 6pm (10hrs)	35	35
Years of work experience		
1 – 5	31	31
6 – 10	40	40
11 – 20	14	14
Above 20	15	15
Range of income per week		
<₦ 2000	27	27
₦2000 – ₦5000	59	59
Above ₦5000	14	14

Table 3: Information regarding ocular injuries

Mode of treatment	Frequency	%
Hospital	34	34
Self-medication	50	50
Lay referral	16	16
Use of protective eye equipment		
Yes	22	22
No	78	78
Impact of ocular injury on income		
Yes	79	79
No	21	21