

# Knowledge, Attitude and Use of Eye Protectors by Welders in a Rural Community of Imo State, Nigeria

Chukwuoha Chigozie Mary<sup>1</sup>, Nwoke Eunice Anyalewechi<sup>2</sup>,  
Esenwah Emmanuel Chukwudi<sup>3</sup>, Azuamah Young Christian<sup>3</sup>,  
Nwaigwe Obianuju MaryJane<sup>1</sup>

<sup>1</sup>Mercy Eye Clinic, 29 Wetheral Road, Owerri, Imo State, Nigeria.

<sup>2</sup>Department of Public Health, Federal University of Technology, Owerri, Imo State, Nigeria.

<sup>3</sup>Department of Optometry, Federal University of Technology, Owerri, Imo State, Nigeria.

Corresponding Author: Chukwuoha Chigozie Mary

## ABSTRACT

Knowledge, Attitude and Practice studies can be used for diagnostic purposes for which they describe the population's current knowledge, attitude and practice as well as being implemented to increase insights in a current situation and in appropriate specific interventions.

**Aim:** To assess the knowledge, attitude and use of eye protectors by welders in Umualum, a rural community in Owerri West, Imo State, Nigeria and to assess if there is a relationship between knowledge, attitude and their age, educational attainment and years of service.

**Materials and methods:** Descriptive and cross-sectional survey was used. 260 welders participated in the study. A validated questionnaire was used for data collection and data analysed with descriptive statistics. The research hypotheses were tested using the Chi-square test.

**Result:** There was a relatively high level of knowledge (86.2%) that use of eye protectors prevents work-related ocular hazards/injuries. Generally, the level of attitude of the welders towards use of eye protectors was poor (59.2%) and the constant use of eye protectors was low (34.2%) as compared to the level of knowledge. There was a significant relationship between age, educational attainment and years of service ( $P < 0.001$ ) and the level of knowledge of the use of eye protectors as well as the attitude of the welders towards the use of eye protectors ( $P < 0.001$ ;  $P = 0.036$ ).

**Conclusion:** The attitude of the welders in Umualum should be modified through continuous eye health and occupational health and safety education for health safety and increased productivity.

**Keywords:** knowledge, attitude, practice, eye, protectors, welders

## INTRODUCTION

Knowledge, Attitude and Practice (KAP) model is used to investigate human behaviour concerning a topic<sup>1</sup>. It is known that the triad of knowledge, attitude and practice in combination, govern all aspects of life in human societies, and all three pillars together make up the dynamic system of life itself. It identifies what people know (Knowledge), how they feel (Attitude) and what they do (Practice). KAP studies can be used for diagnostic purposes for which they

describe the population's current knowledge, attitude and practice. Secondly they can be implemented to increase insights in a current situation and help design appropriate specific interventions. Thirdly, they can be used as an evaluation tool to evaluate the effectiveness of certain interventions or programmes. In conducting a KAP study, division of the population into smaller categories is typically desirable as differing groups in the community have different educational, cultural, and

socioeconomic backgrounds and therefore will likely have differing levels of KAP. In practice, this distinction can be made based on geographical characteristics of the group in either rural or urban settings<sup>2</sup>. Also, KAP questions tend to reveal not only characteristic traits in knowledge, attitude and behaviours about health related to religious, social and traditional factors, but also the idea that each person has of the body or of disease. These factors are often the source of misconceptions or misunderstandings that may represent obstacles to the activities to be implemented and potential barriers to behavioural change. The obstacle to change may be a lack of knowledge of the benefits of health, or lack of knowledge of the problem and its severity. It can also reveal sociocultural or religious representations strongly linked to the change in question or a lack of expertise. Finally, the obstacle to change, resistance or refusal may also be an expression of cultural resistance and/or may reveal a political stance. Focusing on knowledge and attitudes of the respondents, these questions are intended to identify key knowledge, social skills and know-how commonly shared by a population or target group about particular issues on which one intends to start a programme and/or activities on health education. A KAP survey can measure the extent of a known situation, to confirm or disprove a hypothesis and provide new tangents of a situation's reality. It can enhance the knowledge, attitude and practices around specific themes, to identify what is known and done about various subjects relating to health. Understanding the level of knowledge, attitude and practice will enable a more efficient process of awareness creation and a programme could be tailored more appropriately to the needs of the community. This study can help to understand what the welders know about the topic: implications, hazards, ability to prevent hazards, risk behaviour, among others. This KAP surveys show how the welders feel towards the research topic: are they willing to protect themselves against

hazards and are they aware of the danger of not doing so? The practice questions give an idea on how they protect themselves against hazards and whether they engage in any risk behaviour. This also gives an idea of the danger of hazards that may occur<sup>2</sup>.

Empirical evidence has revealed that the health of an individual is related to the working conditions prevailing in his/her work place. Thus, as industries develop and machines replace people, the work force becomes increasingly exposed to conditions which prove to be life threatening at times<sup>3-4</sup>. Work-related injuries account for a substantial percentage of ocular injuries. Workers who have the highest risk of eye injuries include fabricators, laborers, equipment operators, repair workers, production and precision workers. More than half of work-related eye injuries occur in the manufacturing, service and construction industries. Welders belong to the construction industry. The more common welding processes can be classified as arc welding, gas welding, resistance welding, energy beam welding and solid-state welding,<sup>5-6</sup> the former two being most common in Nigeria. Those most at risk for welding-related eye injuries are workers in industries that produce industrial and commercial machinery, computer equipment, and fabricated metal products. As much as majority of work-related injuries are preventable; absent, inadequate or inappropriate use of Personal Protective Equipment (PPE) remains an important risk factor. PPE refers to all the equipment intended to be worn or held by a person at work to protect him or her from risks to his/her health and safety, and these include safety helmets, eye protection devices, gloves, high visibility clothing, safety footwear and safety harness.

Eye injuries account for one-quarter of all welding injuries, making them by far the most common injury for welders, according to research conducted at the Liberty Mutual Research Institute for Safety<sup>7</sup>. Protecting the eyes from injury is one of the most basic things required to

keep vision healthy throughout life. Eye-protectors may be in the form of spectacles, goggles (cup or box), screens or visors supported by a headband or in the form of a helmet<sup>8</sup>. The general PPE requirements mandate that employers should conduct a hazard assessment of their workplaces to determine what hazards that require the use of PPE are present. The use of PPE is often essential, but it is generally the last source of protection when engineering controls, work practices and administrative controls are not effectively mitigating a safe work environment. This concept is supported by the Occupational Safety and Health Administration (OSHA)<sup>9</sup>. Workers should have access to PPE at no cost; including correct sizes and type that take allergic conditions into consideration. PPE can only be an effective control strategy if appropriate and reliable protective equipment is provided and if employees consistently use it<sup>10</sup>. Every worker is responsible for his own safety and the safety of anyone else who may be affected by the work he does<sup>11</sup>.

## **MATERIALS AND METHODS**

Descriptive and cross-sectional survey designs were used to determine the knowledge, attitude and use of eye protectors by welders in Umualum, Owerri West, Imo State. The study population consisted 260 welders between the ages of 11-60years drawn from the population of welders practicing their trade in the government approved mechanic village in Umualum, Owerri West, Imo State and the screening exercise was carried out on agreed dates at the mechanic village. Interviewer administered questionnaire consisting open and closed ended questions was used for collecting data. Questionnaire was preferred in this study because of its suitability for gathering information from a large number of participants. It was also less intrusive; especially for those participants who could read and write. The questionnaire was distributed to the participants after verbal informed consent was obtained from each

participant. Those who could not read or write were assisted by the researcher in completing the questionnaire. However, free eye test and treatment were administered to the welders as a motivation during the data collection exercise. The test-retest method was used to test the reliability of the questionnaire. The questionnaire was initially administered to 10 subjects not inclusive in the study and the process was repeated two weeks later. The results were ranked and compared for consistency through Pearson correlation test. A correlation (reliability) coefficient of 0.80 was obtained. Ethical clearance for this study was obtained from the Department of Public Health, Federal University of Technology, Owerri. Verbal informed consent was obtained from each participant.

## **Statistical Analysis**

The data collected were analysed with the Statistical Package for Social Sciences (SPSS) Version 21 computer software using descriptive statistics. The level of knowledge of the use of eye protectors, attitude towards the use of eye protectors and the use of eye protectors were measured using the Likert scale of measurement. The research hypotheses were tested using the Chi-square test of dependence (2-tailed test), at 0.05 significance level (95% confidence interval). Results were reported in the form of frequency tables and graphs.

## **RESULTS**

Assessment of the level of knowledge of welders in Umualum, Owerri West, Imo State, on the use of eye protectors revealed 255(98.1%) of the welders were aware of the activities in their daily work that pose risk of ocular hazard/injury which could be prevented with the use of eye protectors. Among the activities they carry out as welders, most of the welders reported more than one welding activity that poses risk of ocular hazards/injuries. 247(41.9%) of the welders were aware that welding without use of eye

protectors poses risk of ocular hazard/injury, followed by 203(34.4%) who were aware that hammering metal without use of eye protectors also poses risk of ocular hazard/injury. 89 (15.1%) of the welders knew that spray painting without use of eye protectors poses risk of ocular hazard/injury, while 39(6.6%) of the welders knew that sanding without the use of eye protectors poses risk of ocular hazard/injury. The least frequency 7(1.2%), was found among those who knew that soldering without the use of eye protectors poses risk of ocular injury. Two hundred and thirty-four, (234, 90%) knew how the activities they carry out could cause ocular hazard/injury without use of eye protectors while 26 (10%) had no knowledge. Furthermore, 226(86.9%) of the welders were aware of how these ocular hazards/injuries could be prevented but the remaining 34 (13.1%) had no knowledge. Also, 224(86.2%) of the welders knew that work-related ocular hazards/injuries with respect to their jobs as welders could be prevented with the use of eye protectors while 28(10.8%) of the welders had no knowledge of how these ocular injuries could be prevented. 8(3.0%) of them believed that they had adequate protection with safety wears and use of handkerchiefs across their face. On the means of knowledge about eye protectors, 151(58.1%) of the welders first learnt about eye protectors from their trainers/mentors, followed by 79(30.4%) of them who had first learnt about eye protectors from their colleagues, both as co-apprentices and co-workers. 20(7.7%) of the welders first learnt about eye protectors through some other means such as workshops and symposia, while 10(3.8%) of them first learnt about it from health workers. It was also noted that 238(91.5%) of the welders wished they could get more knowledge about eye protectors while 32(8.5%) did not wish to have more knowledge about it. 126(49.9%) of the welders reported that the best means of communication on the knowledge about eye protectors was at the training institutions followed by 126(37.6%) who

reported that the best means of communication about eye protectors was through health workers. 21(6.0%) of the welders reported radio broadcast as the best of communication about eye protectors while 1(0.3%) of them reported newspaper/magazine as the best means of communication and another 1(0.3%) of them reported television programme as the best means. However, many of the welders reported more than one means of communication on the knowledge about eye protectors. On the knowledge about the type of eye protectors that would be most suitable for the job they do, 186(71.5%) had knowledge about safety goggles, 66(25.4%) knew about face shields, 1(0.4%) knew about welding helmets while 7(2.7%) had no knowledge. Overall, 50.4% (131) of all the welders had good knowledge of the use of eye protectors while 49.6% (129) had poor knowledge.

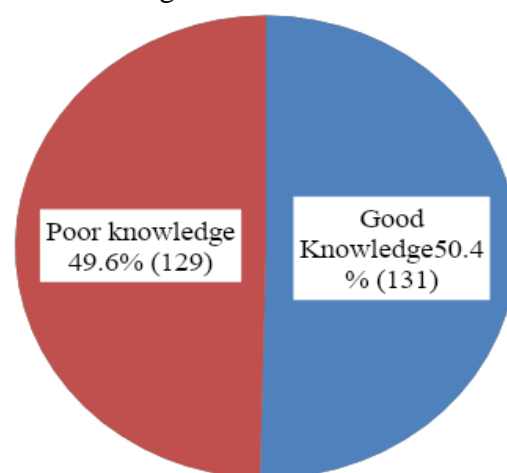


Fig. 1 Overall level of knowledge of Welders in Umualum, Owerri West, Imo State, on the use of eye protectors

While assessing the attitude of welders in towards the use of eye protectors, 231(88.9%) of them strongly agreed that eye protectors should be compulsory items among their welding equipment, 23(8.8%) agreed that eye protectors should be compulsory items among their welding equipment, 1(0.4%) strongly disagreed and 1(0.4%) disagreed that eye protectors should be compulsory items among their welding equipment while 4(1.5%) of the welders had no opinion about eye protectors being compulsory items among their welding

equipment. The results also show that 222(85.4%) of the welders strongly agreed that it is necessary to use eye protectors during work, 30(11.5%) agreed that it is necessary to use eye protectors during work. None of the welders strongly disagreed, 1(0.4%) disagreed that it is necessary to use eye protectors during work while 7(2.7%) of the welders had no opinion about it. Also, 154(59.2%) of the welders strongly agreed that using eye protectors during work protects the eye from work-related ocular hazards/injuries, 76(29.3%) agreed to this, 19(7.3%) strongly disagreed, none disagreed, while 11(4.2%) had no opinion about it. However, 182(70%) of the respondents strongly agreed that it is necessary to always use eye protectors while working, 64(24.6%) agreed to this, 5(1.9%) strongly disagreed, none disagreed while 9(3.5%) had no opinion about it. 113(43.5%) strongly agreed that eye protectors should be chosen based on the type of work being done, 63(24.2%) agreed, 45(17.3%) strongly disagreed, none disagrees while 39(15.0%) had no opinion.

Overall, 40.8% (106) had good attitude towards the use of eye protectors while 59.2% (154) had poor attitude.

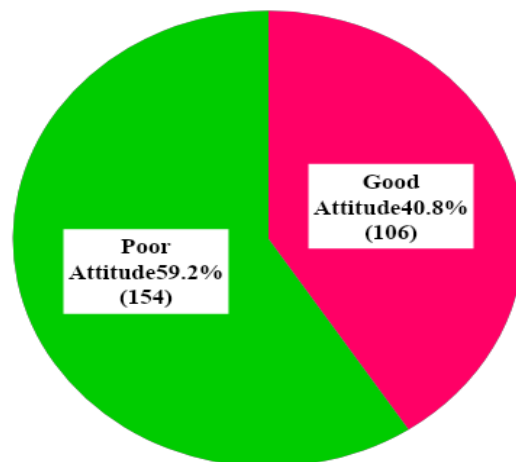


Fig. 2: Overall level of attitude of Welders in Umualum, Owerri West, Imo State, toward the use of eye protectors

Majority of the welders, 183(70.4%), own one or more eye protector(s) while 77(29.6%) own no eye protector. 148(56.9%) of them own safety goggles; 31(12.0%) own face shields and 4(1.5%) own safety spectacles (figure 3).

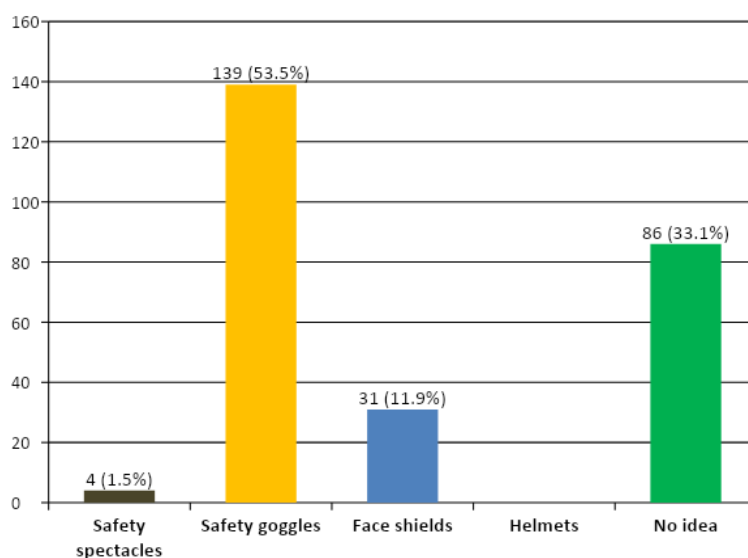


Fig. 3 Types of eye protectors used by Welders in Umualum, Owerri West, Imo State.

Table 1 shows that 188(72.3%) of the welders use eye protectors during work, though some borrowed the eye protectors from their colleagues while 72(27.7%) do not use any eye protector during work. 139(53.5%) of the welders use safety

goggles, 31(11.9%) use face shields and 4(1.5%) use safety spectacles while 86(33.1%) do not use eye protectors. However, only 89(34.2%) use eye protectors always.

The socio-demographic characteristics focused on age, educational attainment and years of service of the participants. The age of participants in this study range from 11 - 60years and above with a mean age of  $\pm 3.5$ years. Majority of the welders 91(35.0%), were in the 41 – 50 years age group followed by 80(30.8%) welders in the 31 – 40 years age group. The least number of welders, 15(6.0%) are in the 11 – 20years age group. All the welders had one form of education or the other, but none had professional training at Polytechnic, College and/or University level. The highest population, 125(37.7%) was seen among those who had secondary education. All participants had put in years of service ranging from 1 – 20 years and above with a mean year of service of  $\pm 4.0$  years (table 2).

**Table 1: Use of Eye Protectors by Welders in Umualum, Owerri West, Imo State**

Questions	Response	Frequency	% frequency
Do you own any Eye Protector?	No	77	29.6
	Yes	183	70.4
	<b>Total</b>	<b>260</b>	<b>100.0</b>
Do you use any Eye Protector?	No	72	27.7
	Yes	188	72.3
	<b>Total</b>	<b>260</b>	<b>100.0</b>
How often do you use Eye Protector?	Never	72	27.7
	Sometimes	99	38.1
	Always	89	34.2
	<b>Total</b>	<b>260</b>	<b>100.0</b>

**Table 2: Distribution of Welders in Umualum, Owerri West, Imo State according to Socio-demographic characteristics**

Socio-demographics	Frequency (N=260)	Percentage
<b>Age</b>		
11 – 20	15	5.8
21 – 30	32	12.3
31 – 40	80	30.8
41 – 50	91	35.0
51 – 60	26	10.0
Above 60	16	6.1
<b>Educational Attainment</b>		
Primary	86	33.1
Secondary	125	48.1
Vocational	49	18.8
Polytechnic/college/university	0	0.0
<b>Years of service</b>		
1 – 5	12	4.6
6 – 10	30	11.5
11 – 15	37	14.2
16 – 20	51	19.6
Above 20	130	50.0

Testing the research hypotheses, there was significant relationship between the age of the welders and the level of knowledge of the use of eye protectors ( $P < 0.001$ ) (table 3). There was also

significant relationship between the educational attainments of the welders and the level of knowledge of the use of eye protectors ( $P < 0.001$ ) (table 4), as well as a significant relationship between the years of service and their level of knowledge of the use of eye protectors ( $P < 0.001$ ) (table 5).

**Table 3: Level of knowledge of Welders in Umualum, Owerri West, Imo State, on the use of eye protectors according to Age**

Age group (years)	Level of Knowledge of the use of eye protectors		Total
	Good knowledge	Poor knowledge	
11 – 20	3 (2.3%)	12 (9.3%)	15 (5.8%)
21 – 30	8 (6.1%)	24 (18.6%)	32 (12.3%)
31 – 40	45 (34.4%)	35 (27.1%)	80 (30.8%)
41 – 50	60 (45.8%)	31 (24.0%)	91 (35.0%)
51 – 60	10 (7.6%)	16 (12.4%)	26 (10.0%)
Above 60	5 (3.8%)	11 (8.5%)	16 (6.1%)
<b>Total</b>	<b>131 (100.0%)</b>	<b>129 (100.0%)</b>	<b>260 (100.0%)</b>

Chi-square = 27.5126      Df = 5      P-value < 0.001

**Table 4: Level of knowledge of Welders Umualum, Owerri West, Imo State, on the use of eye protectors according to Educational Attainment**

Educational attainment (years)	Level of Knowledge of the use of eye protectors		Total
	Good knowledge	Poor knowledge	
Primary	30 (22.9%)	56 (43.4%)	86
Secondary	80 (61.1%)	45 (34.9%)	125
Vocational	21 (16.0%)	28 (21.7%)	49
<b>Total</b>	<b>131 (100.0%)</b>	<b>129 (100.0%)</b>	<b>260 (100.0%)</b>

Chi-square = 18.6462      Df = 2      P-value < 0.001

**Table 5: Level of knowledge of welders in Umualum, Owerri West, Imo State, on the use of eye protectors according to Years of service**

Years of service	Level of Knowledge of the use of eye protectors		Total
	Good knowledge	Poor knowledge	
1 – 5	3 (2.3%)	9 (7.0%)	12 (4.6%)
6 – 10	6 (4.6%)	24 (18.6%)	30 (11.5%)
11 – 15	14 (10.7%)	23 (17.8%)	37 (14.2%)
16 – 20	20 (15.3%)	31 (24.0%)	51 (19.6%)
Above 20	88 (67.2%)	42 (32.6%)	130
<b>Total</b>	<b>131 (100.0%)</b>	<b>129 (100.0%)</b>	<b>260 (100.0%)</b>

Chi-square = 34.6253      Df = 4      P-value < 0.001

Again, the hypotheses result showed a significant relationship between the age of the welders and their attitude towards the use of eye protectors ( $P < 0.001$ ) (table 6) as well as a significant relationship between the educational attainment of the welders and their attitude towards the use of eye

protectors ( $P < 0.001$ ) (table 7) and a significant relationship between years of service of the welders and their attitude towards the use of eye protectors ( $P = 0.036$ ) (table 8).

**Table 6: Attitude of Welders in Umualum, Owerri West, Imo State, towards use of eye protectors according to Age**

Age group (years)	Attitude towards use of eye protectors		Total
	Good attitude	Poor attitude	
11 – 20	2 (1.3%)	13 (12.3%)	15 (5.8%)
21 – 30	5 (3.3%)	27 (25.5%)	32 (12.3%)
31 – 40	45 (29.2%)	35 (33.0%)	80 (30.8%)
41 – 50	70 (45.4%)	21 (19.8%)	91 (35.0%)
51 – 60	20 (12.9%)	6 (5.7%)	26 (10.0%)
Above 60	12 (7.8%)	4 (3.8%)	16 (6.1%)
<b>Total</b>	<b>154 (100.0%)</b>	<b>106 (100.0%)</b>	<b>260 (100.0%)</b>
<b>Chi-square = 55.3911      Df = 5      P-value &lt; 0.001</b>			

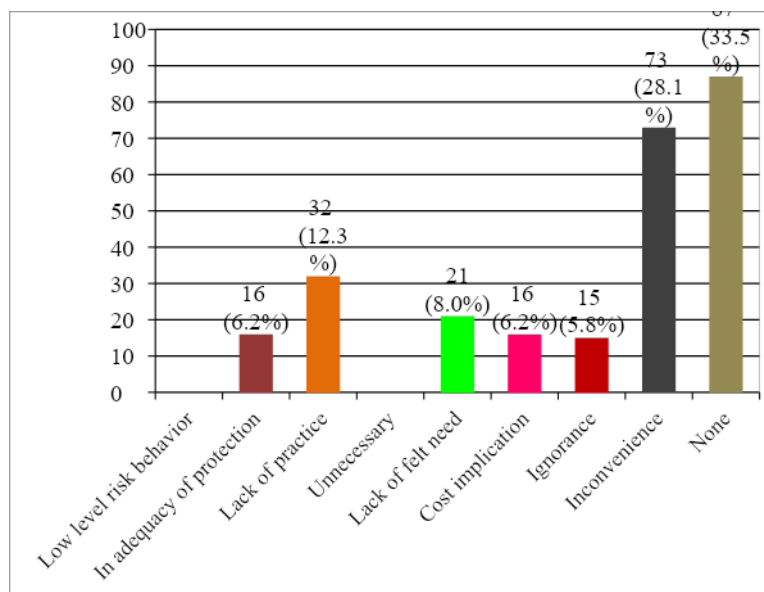
**Table 7: Attitude of Welders in Umualum, Owerri West, Imo State, towards use of eye protectors according to Educational Attainment**

Educational attainment (years)	Attitude towards use of eye protectors		Total
	Good attitude	Poor attitude	
Primary	36 (23.4%)	50 (47.2%)	86 (33.1%)
Secondary	98 (63.6%)	27 (25.4%)	125 (48.1%)
Vocational	20 (13.0%)	29 (27.4%)	49 (18.8%)
<b>Total</b>	<b>154 (100.0%)</b>	<b>106 (100.0%)</b>	<b>260 (100.0%)</b>
<b>Chi-square = 36.6476      Df = 2      P-value &lt; 0.001</b>			

**Table 8: Attitude of Welders in Umualum, Owerri West, Imo State, towards use of eye protectors according to Years of service**

Years of service	Attitude towards use of eye protectors		Total
	Good attitude	Poor attitude	
1 – 5	5 (3.3%)	7 (6.6%)	12 (4.6%)
6 – 10	14 (9.0%)	16 (15.1%)	30 (11.5%)
11 – 15	28 (18.2%)	9 (8.5%)	37 (14.2%)
16 – 20	35 (22.7%)	16 (15.1%)	51 (19.6%)
Above 20	72 (46.8%)	58 (54.7%)	130 (50.0%)
<b>Total</b>	<b>154 (100.0%)</b>	<b>106 (100.0%)</b>	<b>260 (100.0%)</b>
<b>Chi-square = 10.2990      Df = 4      P-value = 0.036</b>			

There were various reasons for non-use of eye protectors by participants in this study. These include inconvenience while using eye protectors, lack of practice, lack of felt need for eye protectors during work and inadequacy of protection from ocular hazards/injuries with the use of eye protectors. Furthermore, some participants said they do not use any eye protector(s) during work due to cost implication of getting an eye protector while others said they were ignorant of the use of eye protectors during work. No reason was reported among 87(33.5%) of the welders (figure 4).



**Fig. 4** Reasons for non-use of Eye protectors by Welders in Umualum, Owerri West, Imo State.

## DISCUSSION

All participants in this study were males aged between 11 – 60 years with a mean age of  $\pm 3.5$  years. The highest frequency of welders was among those between 41-50 years which coincides with the best productive years of man. The male

dominated sex distribution is probably due to the fact that welding is high-tech job that deals with heavy working tools and machinery and requires a lot of physical strength which the body build of the female folk may not be able to cope with. There was a high level of knowledge, among the

welders, that their job poses a risk of ocular injuries and/or hazard. On the other hand, majority of the welders, were aware that the use of eye protectors prevents work-related ocular injuries and/or hazards. This result is in line with the study by Chepkener<sup>12</sup> on the knowledge, attitude and practices of eye safety among Jua Kali industry workers in Nairobi, Kenya, where it was found that majority of the participants (86.8%) had knowledge on the risks and mechanisms of work-related eye injuries and 73% had knowledge that these could be prevented through use of personal protective equipment. The result also falls in line with another study by Ajayi et al.<sup>13</sup> to determine the level of awareness and practice of use of protective eye devices among welders in Ile-Ife, where it was found that there was high level of awareness of protective devices among the welders.

On the knowledge about the type of eye protector most suitable for their job, majority had knowledge about safety goggles and others knew about face shields and welding helmets while a few others had no knowledge about it. Most of these welders had first learnt about eye protectors during their apprenticeship, from their colleagues i.e. co- apprentices and co-workers, through self-knowledge and from health workers. Another study with similar result is the study by Adelani et al.<sup>14</sup> on the assessment of the use of safety devices by Welders in Osogbo, Nigeria, where majority of the respondents, 79.1%, had first learnt about eye protectors from their trainers. However, this result is in contrast with the study by Omolase and Mahmoud<sup>15</sup> where majority of the respondents (66.7%) knew of the ocular hazards of their occupation through personal experience.

Generally, the level of attitude of the welders was poor (59.2%). However, majority of them strongly agreed that eye protectors should be compulsory items among their welding equipment. Most of the welders also strongly agreed that it was necessary to always use eye protectors while working as using this protective device

prevents work-related ocular hazards/ injuries. A few of the welders were very positive about eye protectors being chosen based on the type of work being done. This result is in line with the study carried out by Ziauddin et al.<sup>16</sup> amongst steelworkers in India, on the knowledge, attitude and practices about personal protective equipment, where results showed 75% – 97% of the employees responded positively with regard to knowledge and attitude about personal protective equipment.

Majority of the welders owned one or more eye protector(s) though not all of them used it. Safety goggles were the most familiar eye protectors owned and used among the welders, then face shields and safety spectacles. The welding goggles which were the most common eye protectors identified by the welders were the ones mostly within their reach. A good number of the welders use eye protectors during work, though some borrowed the eye protectors from their colleagues but the use of these eye protectors always was unremarkable. From the result, it could be said that the regular use of eye protectors among the welders is low as compared to their level of knowledge about the use of eye protectors. This result is in line with the study by Omolase and Mahmoud<sup>15</sup> in Owo, Ondo State, Nigeria, which was designed to determine the degree of compliance by some Nigerian welders with the usage of protective goggles, in terms of usage of eye protectors. However, the two studies do not tally in terms of magnitude of those that use eye protectors. Omolase and Mahmoud reported that only few respondents (17.5%) use protective goggles always, 30.0% often, 51.3% occasionally and 1.2% rarely. This difference in terms of magnitude of those that use eye protectors may be due to the fact that welders in Umualum, Owerri West, Imo State, are in a better developed socio-demographic zone. Hence, civilization has played a major role in their knowledge and attitude about the use of eye protectors than the welders in Owo, Ondo state. Also, the result of this study on the use of eye



protectors by welders in Umualum, Owerri West, Imo State, does not align with the study conducted by Ajayi et al.<sup>13</sup> where it was reported that less than half of the Welders in Ile-Ife (45.9%) own protective eye devices and only 9.6% made use of the devices always.

Results from the research hypotheses revealed that there was significant relationship on the level of knowledge of the use of eye protectors in terms of the age, educational attainment and years of service ( $P < 0.001$ ) of the welders in Umualum, Owerri West, Imo State. The level of knowledge of the participants on the use of eye protectors was not the same in terms of age, educational attainment and years of service. Also, for attitude, the results showed that there was a significant relationship between the attitude of the welders towards use of eye protectors with respect to their age, educational attainment ( $P < 0.001$  respectively) and years of service ( $P = 0.036$ ). These imply that the age, educational attainment and years of service of the welders played a significant role on their level of knowledge on the use of eye protectors and their attitude towards the use of eye protectors. Those older in age, those with Secondary and Vocational education and those who had put in more years of service had a more positive attitude towards the use of eye protectors. These results are in agreement with the study by Adelani et al.<sup>14</sup>, where they reported that there was significant difference on the knowledge of Welders about the use of safety devices, in terms of their educational attainment and years of service. Also, both studies are in agreement with respect to the Attitude of Welders on the use of eye protectors based on socio-demographic factors. Indeed, Adelani et al.<sup>14</sup> reported that welders with post-secondary education, such as Ordinary National Diploma (OND), Higher National Diploma (HND) and National Certificate in Education (NCE) qualifications, complied much better on the use of eye protectors than those with lower education. Similarly, those with longer years of work experience

were more compliant with the safety rules more than those with lesser years of work experience.

Up to 66.5% of the participants in this study, including those who have eye protectors, gave various reasons for non-use or occasional use of eye protectors during work. These reasons include inconvenience, lack of practice of use of eye protectors, lack of felt need for eye protectors, inadequacy of protection from ocular hazards/injuries with use of eye protectors, cost implication and ignorance. These reasons given by the welders for non-use of eye protectors, especially, inconvenience and inadequacy of protection of eye protectors from ocular hazards/injuries which were the most implicated reasons given, could probably be due to wrong selection of eye protectors for the type of work being done, as the appropriate eye protectors should be comfortable and provide adequate protection during work. These reasons given in this study for non-use of eye protectors tally with those given in the studies carried out by Dupe et al.<sup>17</sup> and Omolase and Mahmoud<sup>15</sup> where results found that those who did not use any eye protective devices though possessed them, reported different reasons such as low level risk believe (12%), discomfort (20%), inadequacy of protection (44%), lack of practice (16%), lack of felt need (35.8%), ignorance (35.8%), inconvenience (28.8%), unnecessary (8%). However, their magnitudes vary. This may also be due to the socio-demographic natures of the zones, as the South East is known for their capitalist tendency, belief in self-employment and have better exposure.

## CONCLUSION

There is a high level of knowledge of the risk of work-related ocular hazards/injuries and the means through which they can occur among welders in Umualum, Owerri West, Imo State, Also, there is a relatively high level of knowledge of the use of eye protectors to prevent work-related ocular hazards/injuries. The positive

response to knowledge of the use of eye protectors was an indication of the participants having a high degree of awareness about eye protectors though generally, attitude towards the use of these eye protectors was poor and constant use of eye protectors was low as compared to the level of knowledge. The attitude of the welders should be continuously modified by continuous eye health, occupational health and safety education and supervision, for health safety and increased productivity. It should be noted that one of the goals of occupational health is to provide a safe 'occupational environment' that will safeguard the health of the worker and consequently, increase industrial productivity. Staff training is an essential part of establishing and maintaining safe working conditions and habits. In this study, it was observed that a good number of the employees and apprentices were less concerned about using eye protectors consistently during work. This was mostly due to the fact that their employers and trainers were also less concerned. Hence, all employees must, in accordance with the Occupational Health and Safety Act 85, be informed about the hazards in their working environment. Also, employers should adopt proper safety measures to eliminate and/or minimise risks of ocular hazards/injuries associated with work as workplace settings vary widely in size, sector, design, location, work processes, workplace culture, and resources. In addition, workers themselves are different in terms of age, gender, training, education, cultural background, health practices, and access to preventive health care. This translates to great diversity in the safety and health risks for each industrial sector and the need for tailored interventions<sup>19</sup>. Staff training is an essential part of establishing and maintaining safe working conditions and habits. All employees must, in accordance with the Occupational Health and Safety Act 85, be informed about the hazards in their working environment and the proper procedures the employer has adopted to eliminate and

minimise the risks. In addition, every individual employee ought to be aware of the broad range of hazardous materials that may cause occupational diseases over a long period and possible physical and psychological harm or injury<sup>19</sup>.

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