

STUDY OF THE PRACTICE OF EYE PROTECTION AT WORK AMONG AHOGBOHOU WELDERS (COTONOU, BENIN REPUBLIC)

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ABSTRACT

This research aims to study the protection of eye by welders during their professional practice. It is a cross-sectional descriptive study that took place in October 2018 in the district of Ahogbohou in Cotonou. An exhaustive sampling enabled 44 welders to be surveyed, having given free and informed consent, using a questionnaire and an observation grid. The informed consent of the respondents was obtained verbally. Data processing and analysis was done using Epi Data software, version 2.2.3.187. All surveyed welders knew that the eyes are at risk during their work. The main factors quoted by welders were: flame (100%); dust (65.9%) and metal breakage (36.3%). The well-known protective equipment was mainly: smoked glass 100%; mask 93.1%; visor 61.3%; welding helmet 25%. Wearing smoked glasses was the predominant practice (69.2%). The surveyed welders (92.3%) did not wear eye protection equipment during grinding and cutting metals. Welders' eye protection recommendations were weakly applied by welders in Ahogbohou district, both during welding and grinding. Then, it urges to organize Information Education and Communication sessions for Behavior Change among these welders in order to guarantee their safety at work.

Keywords: Eye protection, welders, safety, work.

INTRODUCTION

A trauma is a damage to a person, tissue or organ, such as the eye; caused by energy transfer and mainly in one of the following forms of energy: mechanical, thermal, electrical and radiant (1).

Indeed, eye problems include all damage to the eye and its appendices by direct contact with hot objects, prickly objects, chemicals, electrical sources, ultraviolet radiation, X-rays or microwaves (2). In addition, unlike other causes of blindness such as cataracts, trachoma, xerophthalmia, where epidemiological studies have largely contributed to better define the profile of these pathologies, in the case of eye injuries, epidemiological data are scarce or less documented in some countries (3) including Benin.

Eye injuries have long been considered as purely clinical problem. However, like any eye problem, eye injuries do not occur as an epiphenomenon; there is evidence that some socio-professional groups have a higher risk of exposure to these injuries. For instance, this is the case of welders who are more exposed to UV and radiation during the practice of their profession. Welders are workers who use specialized equipment to weld, i.e. ensure the continuity of the material between metal parts to be assembled. They also cut or cut metal objects (4) and grind them. Many of these professional exercises are risks, that's why they should know the safe use of their equipment and the necessary eye protection measures (3). It is noticed that protective equipment is not used. It is therefore important to know that wearing the protective glasses or welding helmet is fundamental. While many protective measures are taken to preserve the physical integrity of workers, it is also important to ensure that eye protection is practiced and that the risks of welding work among welders are well understood. This research aims to study the practice of eye protection by welders in Ahogbohouè district during their professional activities.

Method

This is a descriptive cross-sectional study that took place in October 2018 in Ahogbohouè district in the commune of Cotonou, Littoral Department in the Republic of Benin.

An exhaustive sampling allowed to identify 44 welders who each willingly and verbally gave free, informed consent without tip. Thus, all arc and autogenous welders operating their professional activities in the Ahogbohouè district are also included.



Figure 1: study area

The welders who participated in the pre-survey phase and those who made themselves unavailable successively after three visits were not included in the sample. Data were collected using a questionnaire and an observation grid. First, the respondents were observed in the midst of welding, cutting and grinding or metal- trimming; then, they were asked to complete the questionnaire.

The questionnaire was anonymous and known to the respondent, and the objectives of the study are explained to them. The questionnaire consists of thirteen open-ended questions. Apart from the multiple-choice questions, no suggested answer was made to the respondent. The answers were faithfully transcribed on the form. An audit is then carried out at the end of the interview by reading the answers given by the respondent in order to limit hearing errors. No comment was made by the interviewer when the questionnaire was administered.

The judgment criteria were established on the basis of recommendations from INRS and CNAMTS: Prevention of Occupational Risks 2008. These are:

- knowledge of protective equipment;
- the use of standard-compliant eye protection equipment;
- the use of adequate eye protection equipment for cutting metals;
- the frequency of eye injuries that occur during the practice of the profession;
- the delay in seeking treatment in the event of eye trauma;
- the disuse of protective glasses for welding and metal cutting at work;
- the value of visual acuity from afar.

At the end of the investigation, the forms were subjected to a manual examination in order to check the completeness of the filling and the consistency of the data. The processing and analysis of the collected data was done using the Epi Data version 3.1 software.

RESULTS

➤ Seniority in the practice of the welding profession, practice sector and affiliation with a workers' organization

The majority of respondents (84.09%) have at least 5 years of seniority. However, only 29.55% of respondents work in the formal sector against 70.45% working in the informal sector. In fact, 95.4% of welders are not affiliated with a workers' organization.

➤ Knowledge of eye protection equipment

All respondents claim to know about the eye hazard protection equipment to which they are exposed.

➤ Knowledge of the risk factors associated with the welder's profession

All of the surveyed welders knew that their eyes were exposed to risk factors when exercising their profession.

Table I: Breakdown of respondents based on eye risk factors they believe they are exposed to in Ahogbohouè district in 2018

Eye risk factors cited	n=44	(%)
Flame	44	100
Dust	29	65,9
Light rays	5	11,36
Metal cut	16	36,36

➤ Eye protection

All the surveyed welders claim to know all the means of eye protection and have cited the smoked glasses (glasses); Masks, welding helmets; the visor; the flexible frame.

○ Welder's eye protection during welding

Table II: Eye protection equipment worn by the welder during welding in the Ahogbohouè district in 2018

Eye protection equipment worn	n=39	(%)
Smoked glass	27	69,23
Mask	4	10,25
None	8	20,51

○ Welder's eye protection during metal cutting and grinding

Table III: Eye protection equipment worn by welders during cutting or grinding (shred) metals in Ahogbohòuè district in 2018

Eye protection equipment worn	(n=39)	(%)
None	36	92,30
Clear glass	3	7,69

➤ **Compliance with eye protection recommendations and justifications**

Table IV: Frequency of respondents who do not use the recommended eye protection equipment in Ahogbohòuè in 2018

The use according to the recommended standards	(n=44)	%
Yes	1	2. 27
No	43	97. 73
Total	44	100

Table V: Reasons put forward by respondents who do not use the recommended eye protection measures in Ahogbohòuè district in 2018

Reasons	n=43	%
Lack of financial means	43	100
Non-availability of quality protective equipment	34	77,27
None	2	4,54

➤ **Eye protection wearing practice and justifications**

All respondents worked at least once without wearing goggles

Table VI: Reasons put forward by respondents to work sometimes without wearing goggles in Ahogbohòuè district in 2018

Reasons	N =44	%
Quick work	17	38,64
Workload	27	61,36
Oblivion/carelessness	14	31,82

DISCUSSION

➤ **Seniority in the practice of the welding profession, practice sector and affiliation with a workers' organization**

The majority of respondents (79.54%) have professional seniority between 5 and 15 years. This seniority can be an asset for learning about the eye risks associated with welding and wearing Ocular Protection Equipment (OPE) to protect against eye injury. However, seniority can lead to routine which becomes a barrier to behavioral change. Therefore, a prolonged exercise in this occupation can increase occupational exposure to risks. For Guenel P. quoted by Ido E. (2004) "exposure to UV radiation from welding arcs has established a dose-effect relationship depending on the duration of exposure." (5)

The majority (70.45%) of the welders surveyed were working in the informal sector (N=31). This proportion is comparable to the 68.9% of informal welders in Cotonou reported by Davodoun in 2007 (6). In Burkina Faso, Ido E. (2004) found that 86.1% of welders are from the informal sector (5). This could be explained by the non-existence of private control and regulatory structures in the municipalities.

Almost all of the welders (95.45%) were not affiliated with an organization or a health structure. This result joins those of Kora O.B. in 2008 (7) who reported a 100% rate of welders not affiliated with an organization. Likewise, in Burkina Faso, Zerbo J. G. (2015) (8) found that 52.5% of welders were unaware of their affiliation to organizations. It appears the fear of paying dues and taxes, but does not promote the practice of the welder with respect for protective measures.

➤ **Knowledge of eye protection equipment**

All the welders claimed to know all the eye protection equipment and advocated the use of masks, welding helmets, visors, flexible mount. In Burkina Faso Kere T. (2000) (10) and Kora O.B. (2008) (7) in Benin, found that 100% of welders respectively in the city of Ouagadougou and Cotonou knew the different means of eye protection in a welding workshop.

In fact, welders have a full knowledge of protective equipment. This could be a factor favoring the prevention of eye risks in the various welding sites. However, citing smoked glasses leads to the fact that welders have little knowledge of eye protection equipment. This is due to a lack of awareness about the importance of eye protection measures that membership in an organization could fill.

➤ **Eye protection for welders**

○ **Welder's eye protection during welding**

The majority (69.23%) of the welders observed during welding had used unsuitable goggle (smokes) which does not provide proper eye protection as they are not suitable for protection against harmful radiation. The WHO reported in 2008 that working conditions in small businesses are generally poor (11).

In addition, 10.2% of the welders wore welding masks. The same was right with Kora O.B. and Somda C. (7, 12) who reported rates of 12.5% and 15.8% respectively. The low rate of wearing protective equipment could be explained by the ignorance and disregard of welders with regard to the risks to which they are exposed on the one hand and by the absence of equipment in the workshops on the other. Welders at work therefore observe very few measures to prevent occupational hazards.

○ **Eye protection of welders during metal cutting and grinding**

Of all welders observed, 7, 6% wore unstained glasses against a rate of 92.3% who did not wear a bezel to protect their eyes when cutting metal. The risk of eye injury is therefore high with these welders. Similar results were found by Hynty D and Sprivulis P in Australia.(13) The low rate of wearing goggles could be explained by the lack of information from welders about the risks associated with such a practice on the one hand, and their carelessness on the other.

➤ **Knowledge of eye protection recommendations**

In our survey, the majority of welders (97.7%) recognize that their protective practices were not in line with the recommended one. All of the welders (100%) argue the lack of financial means as the reason; and 77.2% addressed the unavailability of controlled equipment. This is contrary to the results of Boissin P. et al in Paris, where the majority of welders had recommended protective equipment (14).

This difference could be elucidated by an absence or poor organization of services for monitoring standards and recommendations in terms of occupational safety on the one hand and the unavailability of stores selling quality equipment at affordable prices on the other.

➤ Eye protection wearing practice and justifications

All respondents worked at least once without wearing goggles. The reasons for the irregularity in the use of eye protection equipment (MPO) are: workload (61.3%), time pressure (38.6%) and oblivion (31.8%). In the survey conducted by Kora B. (7), 74.3% mentioned the workload against 25.6% who mentioned oblivion as a reason. This irregularity in the use of MPOs and the reasons given could be related to poor work organization and neglect of the risks to which this practice exposes welders.

CONCLUSION

This study focused on the use of eye protection among welders in Ahogbohoulé district in 2018. The data collection using a questionnaire and an observation grid revealed that most of the respondents have good knowledge of eye risks in workshops but little knowledge about eye protection equipment. Likewise, the eye protection equipment used does not meet the standards and is not regularly used by the surveyed welders. The authorities in charge of health, labor and socio-professional organizations need to do more to improve workplace safety in welding workshops.

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