



Safety Attitude Towards Personal Protective Eyewear among Metal Workers: A Mini-Review

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KEYWORDS

Occupational health and safety, personal protective eyewear, metal workers, safety attitude

ABSTRACT:

Introduction: Ocular injury is one of the causes of blindness. It is a significant health disability that affects every age group. It may happen at any workplace when workers working on any hazardous activities without maintaining any safety protocol. There are various types of eye injuries like eye contusion, corneal laceration, and open penetrated and perforated eye injury.

Objectives: Asses the evidence about safety attitudes towards personal protective eyewear among metal workers to prevent eye Injuries.

Methods: This review was conducted systematically with occupational health hazards and safety published between January 2001 and January 2020.

Data collection and analysis: We assessed and screened data and extracted by electronic search. We have reviewed and analyzed the all results descriptively.

Results: This review assessed 100 studies. Among these 100 studies, 20 articles were included. Study shows that Metalworkers are exposed to hazards such as dust, particle materials, and explosions. The study also shows that a major part of the population had a significant awareness level about eye injury. A few Studies also show that metal workers had a negative attitude toward protective eyewear at the time of eye injury. The study revealed that workers' experience was significantly correlated with awareness of hazards. Few Researchers recommended that appropriate preventive measures and regular eye screening are necessary for metal workers.

Conclusions: Eye injury is one of the types of preventable blindness. Most Researchers recommended strategies in their study to prevent eye injuries from high-risk hazardous situations.

1. Introduction

Eye injury is one of the types of preventable blindness which cause of blindness, which affects every age group. Ocular Injuries may happen at home, in the place of work, or during any hazardous activities. Types of injuries vary from open foreign body penetration in the eyeball or closed globe injuries like eye contusion or corneal lamellar laceration which results in rupture, corneal perforation, and retinal detachment of the eyeball. The main approach should be to avoid these eye injuries is to educate workers to aware of their high-risk hazardous situations and to take preventive measures to avoid complications. World Health Organization (WHO) suggested that every year, fifty-five million eye injuries occur in the workplace throughout the world⁽¹⁷⁾. As per the United States Eye Injury Register (USEIR), fifty-seven percent of eye injuries occur in young people who have age under 30 years. As per the Occupational Safety

and Health Act (OSHA), Protective eye and face wear has been needed when there are chances of eye injury

We found very little evidence that assessed safety attitudes towards personal protective eyewear among metal workers to prevent eye injuries.

2. Objectives

The objective of this review is to assess the evidence about safety attitudes towards personal protective eyewear among metal workers to prevent eye injuries. The target population involved those directly employed in metallic article production, metal workers who directly support metal production (e.g. metal workers) their co-workers, and other family members of employees who were possibly exposed to work-related hazards and risks in these sectors.



Types of outcomes measured

Primary outcomes

- Eye injuries of any severity.

Secondary outcomes

- Workers Safety attitude.
- Worker's knowledge about Occupational hazards.

3. Methods

Eligibility Criteria: A critical review protocol was used to write this review. Included Studies conducted between January 2001 and December 2020. The following keywords were used: metalworkers, personal protective eyewear, safety attitude, and occupational eye health hazards.

Electronic searches: We searched the following electronic databases:

- Google Scholar
- Web of Science

Other resources: We searched for relevant information on the Internet. We documented published articles by checking references of relevant papers reviewing the article and communicating with authors.

Inclusion & Exclusion Criteria: We applied Boolean logic to the search string to assure specificity and exclude other unrelated studies. An important number of articles (n initial =100) has been obtained. However, a total 20 number of articles were included in this study. There were 20 articles on Occupational Health Safety, occupational hazards, and metal workers. Figure 1 shows a flow chart illustrating the process of analyzing and screening all articles, as well as the explanation for inclusion and exclusion.

Data Extraction: We assessed literature reliability and validity, based on types of bias. We performed a significant appraisal for all included studies. Validity and reliability were ensured by selecting only potential studies in which hazardous exposure and outcomes were documented under the organization of extraneous factors. Our final assessment centered on the validity of the research and also the generalizability of the outcome.

Data Synthesis: In this synthesis, we summarized, interpreted, graded, and integrated the literature in tabular form. After that, we portrayed it in tabular order with its statistical data.

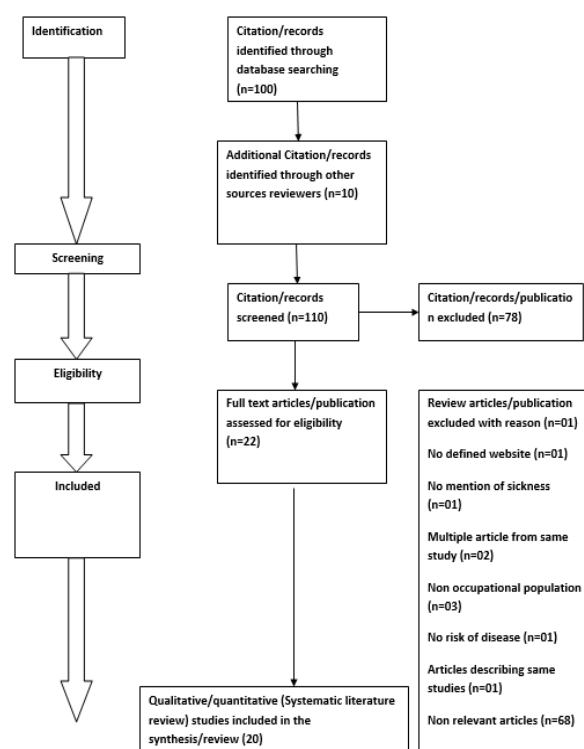


Figure 1. Flowchart diagram of study selection

4. Results and discussion

This review found there are very few studies that used interventions help to prevent eye injuries. Parulekar et al. (2015) found that there are no interventions used to improve worker safety practices.

Study	Type of Study	Study Sample Size	Outcome(s)
Shaikh M (2001)	Cross-sectional	312	Researchers found that 8.7% of welders and 26% of lathe machine workers suffered from injury over six months, while 30.3% of welders and 73.8% of lathe machine workers suffered from injury over the past twelve months. ⁽²²⁾
Parulekar et al. (2015)	Cross-sectional	2886	The ocular injury was in the shipbuilding industry at 2.7% and rubber industry at 2.3%, chemical industry at 1.3%. ⁽²⁰⁾
Dupes D (2005)	Cross-sectional	107	The researcher found that they had uncorrected ametropia (20.6%), uncorrected presbyopia (11.3%), glaucoma (7.5%), and



			pterygium (2.8%). ⁽⁶⁾
Fiebai et al. (2011)	Cross-sectional	500	Metal particles were the chief source of eye injury. 98% population had a high level of awareness of the risk of sustaining an eye injury from welding. ⁽⁹⁾
Mancini G et al. (2005)	Longitudinal Study	237	There was a significant reduction of ocular injury after the “post-intervention reinforcement”, the “late post-intervention”, and the “very late post-intervention” periods. ⁽¹⁵⁾
Karl (2020)	Cross-sectional	382	Half of the metal workers had a history of eye injury. Most of the time it affected both eyes. Attitude towards safety eyewear was very low due to a variety of reasons. ⁽¹¹⁾
Atukunda I et al. (2019)	Cross-sectional	343	There was a high prevalence of ophthalmic disorders among small-scale industry welders. ⁽⁴⁾
Limbu B (2018)	Cross-sectional prospective survey	1236	There was a significant level of work-related eye injury and low PPE usage among the workers. ⁽¹⁴⁾
Norn et al. (1991)	Cross-sectional study	217	Severe impairment of sight due to welding exposure is very little was very less. ⁽¹⁸⁾
Dharani et al. (2014)	Cross-sectional	209	Eye injury is a significant health problem in this area. There is a high prevalence and significant risk of injury in the metal worker population. ⁽¹³⁾
Mary et al. (2020)	Cross-sectional study.	260	The workers had a relatively high level of knowledge (86.2%) regarding eye hazards and ophthalmic safety practices but they had a poor level of attitude (59.2%) towards the use of eye protectors. ⁽¹⁶⁾
AlMahmoud (2020)	Cross-sectional study	384	Workers had a high level of awareness about the safety practice of personal protective eyewear. None of them used
			safety goggles during activities. ⁽³⁾
Kwasi et al. (2018)	Descriptive cross-sectional study	500	Researchers found that 2.1% of visual impairment, and 39.5% of Eye injuries among workers (72.5%) are probably due to their negative attitude towards eye protective devices. ⁽¹⁾
Budhathoki et al. (2014)	Cross-sectional study	300	Researchers found that 90.7% of welders were aware of the hazard and personal protective equipment usage. ⁽⁵⁾
Rasaq et al. (2013)	Cross-sectional study	285	Researchers found that 64.9% of workers had poor attitudes toward the health effects of welding smoke. ⁽¹²⁾
Okeigbemen et al. (2012)	Cross-sectional study	271	Researchers found that 38.4% of workers are exposed to work-related ocular injury. They also found that gas welders were exposed to more work-related injury history compared to electric welders. ⁽¹⁹⁾
Dupes (2005)	Cross-sectional	107	Researchers found that 50% of workers had eye-protective devices but 31.6% of them had a negative attitude to using that device. ⁽⁷⁾
Subramanian et al. (2019)	Longitudinal Study	78	After the intervention, there was a significant improvement in PPE usage among workers from before the intervention. ⁽²³⁾
Prabhu et al. (2017)	Cross-sectional study.	60	Researchers found that 95% of the welders have an awareness of eye hazards and knowledge about personal protective eyewear but only 45% of them used personal protective eyewear daily basis. ⁽²¹⁾
Joseph et al. (2017)	Cross-sectional study.	155	The prevalence of ophthalmic disorders was high among the workers. Negligence and negative attitude towards health hazards and protective equipment which was reported by several workers. ⁽¹⁰⁾



They recommended that Employers and employees strictly maintain safety regulations to decrease the number of occupational eye injuries⁽²⁰⁾. Subramanian et al. (2019) found that they had not screened the patient after three months to see the benefit of the intervention. They recommended Training programs on the usage of PPE and safety education should be conducted periodically for the workers and to maintain strict regulations for safety practices as well as to dissolve the barriers to behavior change⁽²³⁾. Safety behavior alteration may prevent workers from various types of ocular injuries. The most effective and potential approach is educational interventions when they are implemented in conjunction with legal legislation. Lipscomb (2000) has found that interventions are very effective when implemented in conjunction with safety regulations to prevent ocular injuries. Educational interventions will be focus group discussions, leaflets, role play, Sharing of workers' own stories, and informative presentations:

Prabhu et al. (2017) found that the researcher has not conducted any intervention like safety awareness or safety education program which will improve their safety practice. They recommended that it is not enough that workers have knowledge and attitude towards safety⁽²¹⁾. The appropriate safety practice should be maintained by strict and random monitoring of the working field. They suggested Regular follow-up by mentors and mandatory rules may help the welders improve the use of PPE. Any social welfare organization may conduct a safety education program to reduce serious ocular hazards. The budget of intervention will also matter in low-income countries. A printed intervention such as a pamphlet or leaflet is very effective, cheaper, and easier to circulate when we are conducting any awareness workshop. Broadcasting on electronic media and social media is more effective. Dharanipriya et al. (2014) concluded that the study is cross-sectional study nature and has recall bias⁽¹³⁾. They had not quantified some factors like alcohol and tobacco consumption. They recommended for longitudinal study and the role of associated factors of injury among metal workers. Joseph et al. (2017) found that the researcher had not conducted any intervention strategies. Recall bias may be involved while participants reported morbidities suffered in the past⁽¹⁰⁾.

5. Conclusion

The study review recommended Institutional training which improves the usage of protective gear. Safety policies need to be instituted and employers need to provide ergonomically suitable and affordable PPEs at the work site. The review also recommended that health inspectors should assess efficacy and compliance with safety devices at workplaces periodically. The labor

ministry should also suggest following working guidelines and a safe working environment for metal workers in unorganized sectors. Future research in this area should concentrate on well-conducted longitudinal interventional studies. Studies should have a longer follow-up time to better understand the attitude change through an educational intervention. Hazardous Exposure to risks varies by age, gender, profession, and environmental factors and must be assessed before and after an intervention. Studies need to be conducted in low and middle-income countries where poor work environments and lack of appropriate regulation cause a greater risk of injury.

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7. Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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