



Awareness and use of Safety Glasses for the Prevention of Eye Injuries among Motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria

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Abstract

This study examined awareness and use of safety glasses for the prevention of eye injuries among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria. In this study, four research questions with two hypotheses guided the study. A descriptive survey research design was used for the study. The population of this study was estimated to be 5,518 motorcyclists yielding a 357 sample size, A structured questionnaire on four points Likert scale was used for data collection. The instrument was validated with a reliability coefficient of 0.68. Frequencies and percentages, mean (\bar{x}) and the Chi-squared test were used to analyse information generated in this study. The findings of this study showed that: there was inadequate awareness ($\bar{x} = 2.12 < 2.50$) and there was adequate use of safety glasses among motorcyclists in Dutsin-ma, Metropolis & ($\bar{x} = 2.63 > 2.50$). Awareness of safety glasses did not influence their use ($\bar{x} = 1.30 < 2.50$). Awareness of safety glasses did not influence the use of safety glasses ($1.10 > 2.50$). Commercial motorcyclists had more awareness and use of safety glasses than private motorcyclists in Dutsin-Ma Metropolis (193 [54.06%] > [164 [45.94%]]). There was no significant awareness of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria ($\chi^2 = 0.360$, $df = 1$, p -value = 0.549). There was significant use of safety glasses among respondents ($\chi^2 = 29.777$, $df = 1$, p -value = 0.001). The authors concluded that respondents used safety glasses irrespective of their poor level of awareness. The authors recommended among others that motorcyclists should improve their level of awareness of safety glasses, therefore, calling on health educators for quality health education on safety glasses.

Keywords: Appraisal, Safety glasses, Eye challenges, Motorcyclists

Introduction

Emphasis is much on preventive health for holistic healthy living for all. Safety glasses, of course, take from the above statement in protecting the eyes by preventing flying particles such as dust, sand dust and liquid splashes from entering the eyes. According to Anthony (2020), safety glasses resist heat, intense light, dust, impacts, liquid drops/droplets, insects and the effects of a moving vehicle from getting into the eyes. Consequently, safety glasses are an essential part of personal protective tools among workers, especially welders. Safety glasses could be used by a person in any occupation and there are kinds of safety glasses such



as tinted, light tinted and transparent glasses with a variety of lenses with or without a side shield RS Components Ltd., 2021).

Studies have shown that safety glasses are good and effective in saving the eyes from eye injuries. For example, safety glasses had proved 90 per cent effective in protecting and preventing the eyes from injuries if properly worn (Boyd, 2016; Eyecare NG, 2019; All About Vision, 2021). According to Mitch (2021), safety glasses are designed to resist an impact of up to 150 feet per second.

Following the relevance of safety glasses in preventing eye injuries, their appraisal is an area of interest and importance too. Therefore, appraisal in the context of this study is delimited to awareness and use of safety glasses among motorcyclists that comprise both private and commercial riders who travel or move from one place to another by operating a motorcycle. Awareness is a state of being conscious or having sensory patterns or imagery of something like safety glasses (Hasa, 2016). Farlex (2021), defined use as an act of making effective use of something such as safety glasses. In all, this lies in the feeling and purposeful application of the safety glasses by motorcyclists both private and commercial riders to prevent eye injuries.

Health Safety and Environment (HSE) Solution (2017), reported that eye injuries and disease can occur once the eyes are exposed to a powerful breeze, irritants and contaminants such as droplets from cough and sneezing and contaminated finger, objects and flying debris. Besides, All About Vision (2021) stated that besides puncture and wounds, the eyes can suffer bruises and abrasion and other eye injuries such as optical radiation injuries, heat-related injuries, impact injuries, hot steam burns, mucous membrane and even blindness in absence of safety glasses.

On this fact, Construction Fasteners and Tool (2018), reported that eye injuries made up 45 per cent of head injuries and about 700 eye injuries, happen every day in Canada. Also, over 1000 cases of eye injuries occur daily in the United States of America (USA). All About Vision (2021), estimated that roughly 2000 American employees sustain work-related eye injuries daily. Tetteh, Owusu, and Axame (2020), stated that the prevalence of work-related eye injuries in Africa particularly among welders in Accra, Ghana was 47.90 per cent. Ademola-Popoola, Popoola, and Olafimihan (2014) stated that 37 (25.90%) commercial motorcyclists in Ilorin, Nigeria had eye problems due to inadequate use of eye protective shields as 19 (13.30%) of them had an eye check in the time past and 24.50 per cent of them had visual acuity worse than 6/9 from uncorrected refractive errors. Technically, the reports show that awareness and use of safety glasses vary among countries of the world and even within a country.

For example, Boyd (2016) reported that only 10 per cent of workers in America used safety glasses while doing home projects despite their good knowledge of safety glasses. The finding of SafetyGlassesUSA.com (2021), revealed that 65 per cent of Americans used safety glasses when at work. Meanwhile, AlMahmoud, Elkonaisi, Grivna, and Abu-Zidan (2020), reported that 80 per cent of the respondents were aware of safety glasses and none of them used the safety glasses. In Nigeria, Eze, Okoye and Aguwa (2015), reported that 75.20-98.30 per cent of the respondents were aware of safety glasses, yet their use was very poor and low. Similarly, Sabitu, Iliyasu, and Dauda (2009), reported that 60.90 per cent of the respondents used safety glasses.

In Nigeria, the majority of motorcyclists bought the motorcycle with safety glasses and head protective helmets as recommended for safety. Many industrial advertisements carry and disseminate information about the importance of safety glasses for workers such as



motorcyclists. Besides these opportunities, safety glasses and even goggles are sold in most of the shops in Nigeria. Eye protective equipment such as safety glasses is even sold on the roadsides apart from being hawked by some male young youths. Safety glasses are commonly found everywhere and they are affordable. Some of the motorcyclists pasted sticker of speedy bike men with safety glasses covering their eyes on their motorcycles to do the same.

Yet, awareness and use of safety glasses are significantly low among motorcyclists in Nigeria despite, the efforts and provisions of information on safety glasses for healthy living across all occupations that required the use of safety glasses in the country. For example, Eze et al. (2015), reported that the use of safety glasses was significantly low among welders. The low use of safety glasses among participants in Eze et al.'s study may suggest that motorcyclists in the Northwest States, Nigeria especially Katsina State are not exempt from this unsafe practice. Hence, it is noticed that motorcyclists in Katsina State do not wear safety glasses probably because they did not have the awareness of them. They often visit hospitals due to eye injuries. It is in this context that this study investigated awareness and use of safety glasses for the prevention of eye injuries among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria.

Research Questions

1. What is the level of awareness of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria?
2. What is the level of use of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria?
3. What is the influence of awareness on the use of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria?
4. What is the difference between private and commercial motorcyclists in the awareness and use of safety glasses motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria?

Hypotheses

The following hypotheses are formulated to guide this study:

1. There is no significant awareness of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria.
2. There is no significant use of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria.

Materials and Methods

A descriptive cross sectional survey research design was used in this study. The population comprised all motorcyclists in Dutsin-Ma Metropolis. The population of this study was estimated to be 5,518; as of 28th May -30th May, 2021 (State Licence Office, Dutsin-Ma Branch). The sample of this study was 357, using the Research Advisors (2006), sample size estimation which estimated that a 357 sample size is appropriate for a population of 5000-6000. An accidental sampling technique was used to reach the respondents. The sampling method helped the researchers to sample their respondents anywhere they meet them.

The researchers used a self-constructed Questionnaire on Awareness and Use of Safety Glasses among Motorcyclists (QAU-SGM) to collect data. The instrument was assigned four points Likert-type response option. It has three sections; A-C. Section A sought information on the demographic profile of the respondents such as motorcycle classification (private and commercial motorcycle). Section B sought information on awareness of safety glasses and



section C sought information on the use of the safety glasses. Both face and content validity were done by four lecturers from Physical and Health Education, School of Science, Isa Kaita College of Education, Dutsin-Ma of Katsina State, Nigeria. Meanwhile, a reliability coefficient of 0.68 was obtained, using Cronbach alpha after a pilot study in Kankia Local Government Area of Katsina State.

In this study, ten male youths were used as research assistants who, administered the questionnaire, did follow up and collected the duly filled copies within four weeks. Frequencies and percentages were used to present the demographic information of the respondents and to answer research questions 4. Mean (\bar{x}) was used to answer research questions 1-3. A mean (\bar{x}) criterion of 2.50 was set for analysis in this study: $\frac{4+3+2+1}{4} = \frac{10}{4} = 2.50$. Therefore, mean scores of 2.50 and above indicated adequate awareness, use and influence of awareness on the use of safety glasses, while mean scores below the \bar{x} criterion of 2.50 indicated inadequate awareness, use and no influence of awareness on the use of safety glasses. Chi-squared test was used to test hypotheses I and 2 at 0.05 level of significance.

Results

The results of this study were organized and presented in Tables 1-6.

Table 1: Demographic Information of the Respondents

Variables	Number	Percentage
Age		
Below 18 years	92	25.80
18 yrs & above	265	74.20
Total	357	100.00
My motorcycle make		
Baja	50	14.00
Nafang Honda	104	29.10
Qlink	96	26.90
Others	107	30.00
Total	357	100.00
Education qualification		
No formal education	48	13.40
Primary education	70	19.60
Secondary education	86	24.10
Tertiary education	153	42.90
Total	357	100.00
Classification of motorcycle		
Private	164	45.90
Commercial	193	54.10
Total	357	100.00

Table 1 indicates that 92 (25.80%) respondents are below 18 years old and 265 (74.20%) of them are 18 years and above. It indicates that 50 (14.00%) are Baja users, 104 (29.10%) are Nafang Honda users, Qlink is 96 (26.90%) and Other motorcycle users are 107 (30.00%). The Table further shows that respondents with No formal education are 48 (13.40%), Primary Education is 70 (19.60%), Secondary education is 86 (24.10%), and tertiary education is 153



(42.90%) amongst respondents. Finally, it also shows that there are 164 (45.90%) private motorcyclists out of 193 (54.10%) commercial motorcyclists.

Table 2: The Level of Awareness of Safety Glasses among Motorcyclists in Dutsin-Ma (n = 357)

Items on awareness of safety glasses	SA	A	D	SD	X	\bar{x}
I am mindful of safety glasses while travelling.	157	107	66	27	677	1.90
I am conscious of the safety glasses.	115	118	93	31	754	2.11
I have the realization of safety glasses.	137	158	43	19	658	1.84
I have seen and understood the uses of safety glasses.	98	118	109	32	789	2.21
I have the cognizance of safety glasses.	55	142	119	41	860	2.41
I have recommended safety glasses to my colleagues and friends.	115	129	70	43	755	2.11
I have a grasp of safety glasses.	90	154	75	38	775	2.17
Grand \bar{x}						2.12

Key: Strongly agree = SA, Agree = A, Disagree = D, Strongly disagree = SD & Score = X.

Results in Table 2 indicate that awareness of safety glasses among motorcyclists in Dutsin-Ma generated a grand mean (\bar{x}) of 2.12 which is less than the mean criterion of 2.50 set for the decision rule in this study. This implied that there was inadequate awareness of safety glasses among motorcyclists in Dutsin-ma, Metropolis.

Table 3: The Level of use of Safety Glasses among Motorcyclists in Dutsin-Ma

Items on the use of safety glasses	Al	So	Ra	Ne	X	\bar{x}
I have benefited from the use of safety glasses.	70	89	82	116	827	2.32
I use safety glasses.	85	109	99	64	929	2.60
I go along with my safety glass.	91	138	71	57	977	2.74
I use to wear my safety glass.	93	134	70	60	974	2.73
I ply my motorcycle with safety glass.	85	129	81	62	951	2.66
I ride with safety glasses.	74	186	25	72	976	2.73
Dust, flying particles and flies hardly enter my eyes because I use to wear my safety glass.	96	106	78	77	935	2.62
Grand \bar{x}						2.63

Key: Always =Al, Sometimes = So, Rarely = Ra & Never =Ne.

Table 3 indicates that the data in the Table yielded a grand mean (\bar{x}) of 2.63 which is greater than the mean criterion of 2.50 set for this study. This implied that there was adequate use of safety glasses among motorcyclists in Dutsin-Ma Metropolis.



Table 4: Influence of Awareness on the use of Safety Glasses among Motorcyclists in Dutsin-Ma

		I am mindful of safety glasses while travelling.					
I have benefited from the use of safety glasses.		SD	D	A	SA	X	\bar{x}
	Ne	14	18	33	51	454	2.27
	Ra	4	20	28	30	324	0.91
	So	5	10	27	47	356	1.00
	Al	4	18	19	29	274	0.77
		I am conscious of the safety glasses.					
	I use safety glasses.	SD	D	A	SA	X	\bar{x}
	Ne	4	21	25	14	286	0.80
	Ra	8	31	32	28	434	1.22
	So	9	28	38	34	460	1.29
	Al	10	13	23	39	328	0.92
		I have the realization of safety glasses.					
	I go along with my safety glass.	SD	D	A	SA	X	\bar{x}
	Ne	3	16	25	13	246	0.69
	Ra	5	10	27	29	266	0.75
	So	4	13	76	45	504	1.41
	Al	7	4	30	50	300	0.84
		I have seen and understood the uses of safety glasses.					
	I use to wear my safety glass.	SD	D	A	SA	X	\bar{x}
	Ne	6	21	18	15	276	0.77
	Ra	4	28	23	15	322	0.90
	So	10	37	50	37	576	1.61
	Al	12	23	27	31	404	1.13
		I have the cognizance of safety glasses.					
	I ply my motorcycle with safety glass.	SD	D	A	SA	X	\bar{x}
	Ne	8	22	23	9	306	0.86
	Ra	13	31	29	8	422	1.18
	So	8	43	57	21	592	1.66
	Al	12	23	33	17	400	1.12
6.	I have recommended safety glasses to my colleagues and friends.						
	I ride with safety glasses.	SD	D	A	SA	X	\bar{x}
	Ne	18	14	19	21	346	0.97
	Ra	0	4	10	14	92	0.26
	So	18	39	77	52	395	1.12
	Al	7	13	23	31	314	0.88
7.	I have a grasp of safety glasses.						
	Dust, flying particles and flies hardly enter my eyes because I use to wear my safety glass.	SD	D	A	SA	X	\bar{x}
	Ne	15	20	29	13	382	1.07
	Ra	6	14	44	14	336	1.94
	So	10	24	41	31	450	1.26
	Al	7	17	40	32	382	1.07
Grand							1.10

\bar{x}



Key: Never = Ne; Rarely = Ra; Sometimes = So; Always = Al

Data in Table 4 generated a grand mean (\bar{x}) of 1.10, on the influence of awareness on the use of safety glasses, which is lower than the criterion mean (\bar{x}) of 2.50 which was established for this study. This implies that awareness of safety glasses did not influence the use of safety glasses among motorcyclists in Dutsin-Ma.

Table 5: Differences in the Awareness and use of Safety Glasses Based on Motorcycle Classification

Variables	Awareness of safety glasses					
	Private motorcyclists	%	Commercial motorcyclists	%	Total	%
Inadequate awareness	86	49.14	89	50.86	175	100.00
Adequate awareness	78	42.86	104	57.14	182	100.00
Total	164	45.94	193	54.06	357	100.00
Variables	Use of safety glasses					
	Private motorcyclists	%	Commercial motorcyclists	%	Total	%
Inadequate use	103	45.37	124	54.63	227	100.00
Adequate use	61	46.92	69	53.08	130	100.00
Total	164	45.94	193	54.06	357	100.00

Table 5 shows that 86 (49.14%) of private motorcyclists are less compared with 89 (50.86%) of commercial motorcyclists, who indicated inadequate awareness of safety glasses. In this order, it also shows that only 78 (42.86%) of private motorcyclists are lower than 104 (57.14%), who indicated adequate awareness of safety glasses. So, this implied that there was a difference in the awareness of safety glasses among motorcyclists based on motorcycle classification. Hence, commercial motorcyclists had more awareness of safety glasses than private motorcyclists in Dutsin-Ma Metropolis (193 [54.06%] > [164 [45.94%]]). It shows that 103 (45.37%) of private motorcyclists is lower than 124 (54.63%) of commercial motorcyclists, who indicated inadequate use of safety glasses in this study. Finally, it shows that 61 (46.92%) of private motorcyclists are less than 69 (53.08%) of commercial motorcyclists, who indicated adequate use of safety glasses. This implied that there was a difference in the use of safety glasses among motorcyclists based on motorcycle classification. Hence, commercial motorcyclists use safety glasses more than private motorcyclists in Dutsin-Ma Metropolis (193 [54.06%] > [164 [45.94%]]).

Table 6: Chi-square test on awareness and use of safety glasses among motorcyclists in Dutsin-Ma Metropolis

Variables	Observed N	Expected N	%	χ^2	Df	p-value
Awareness						
Adequate awareness	175	178.5		.137	1	.711
Inadequate awareness	182	178.5				
Total	357					
Use						
Adequate use	227	178.5		26.356	1	.001
Inadequate use	130	178.5				
Total	357					

Table 6 shows that the p-value of 0.711 is greater than the 0.05 level of significance established for this study. In this sense, the hypothesis which stated that there was no



significant awareness of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria is not rejected. Therefore, there was no significant awareness of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria ($\chi^2 = 0.137$, $df = 1$, p -value = 0.711). Furthermore, it shows that the p -value of 0.001 is less than the 0.05 level of significance set for this study. So, the hypothesis which stated that there was no significant use of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria is rejected. Hence, there was significant use of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria ($\chi^2 = 26.356$, $df = 1$, p -value = 0.001).

Discussion

The study has provided insight into the awareness and use of safety glasses among motorcyclists who are susceptible to eye injuries. The finding of this study showed that there was inadequate awareness of safety glasses among motorcyclists in Dutsin-ma, Metropolis ($\bar{x} = 2.12$). Inferentially, the finding of this study still maintain that there was no significant awareness of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria ($\chi^2 = 0.137$, $df = 1$, p -value = 0.711). The researchers attributed this finding to a lack of formal enlightenment through health education on the importance of safety glasses to the health of motorcyclists among others. The finding of this study agrees with the finding of Mu'awiyah and Sagir (2012), which revealed that 89.20 per cent of the motorcyclists were inadequately aware of safety glasses. It is also in line with the finding of Omoseye and Kayode (2019), which revealed that there was a dearth of information on safety glasses and poor compliance by motorcyclists in Ibadan. Yet inferentially, the finding of this study does not collaborate with the finding of Annes, Dewi and Suardana (2018), which revealed that there was significant awareness of face shields among motorcycle taxi drivers in Jakarta.

The finding of this study showed that there was adequate use of safety glasses among motorcyclists in Dutsin-Ma Metropolis ($\bar{x} = 2.63$). In this case, the finding skewed inferentially, hence the hypothesis test showed that there was significant use of safety glasses among motorcyclists in Dutsin-Ma Metropolis, Katsina State, Nigeria ($\chi^2 = 26.356$, $df = 1$, p -value = 0.001). By the look of the p -value of 0.001 which proved that the respondents have significant use of safety glasses, it is noticed to be weak. So, this finding is ascribed to the desire of the motorcyclists to use safety glasses to prevent particles from entering their eyes not that they have formal, in-depth and good awareness through health campaign on the significance and roles of safety glasses in preventing eye injuries. In this sense, the finding of this study is in agreement with the finding of Mangus, Simons, Jacobson, Streib and Gomez (2004), which revealed that there was a poor use of safety glasses as only 45.00 per cent of the respondents used safety glasses. It is also congruent with the finding of Mu'awiyah and Sagir (2012) and Ademola-Popoola et al. (2014), which revealed that 86.40 per cent and 94 (65.70%) of the respondents had inadequate use of safety protective devices respectively. Inferentially, the finding of this study agrees with the finding of Achigbu and Ezepue (2013), which revealed that the use of safety glasses was significant as 453 (73.7%), respondents used safety glasses. The finding of this study also collaborates with the finding of Annes et al. (2018), which revealed that there was significant use of safety glasses among motorcyclists in Jakarta.

The finding of this study showed that awareness of safety glasses did not influence the use of safety glasses among motorcyclists in Dutsin-Ma ($1.10 > 2.50$). This could be attributed to the lack of formal enlightenment on health values and the role of safety glasses on eye injuries for motorcyclists in the area.



The finding of this study showed that there was a difference in the awareness of safety glasses among motorcyclists based on motorcycle classification (i.e. between private and commercial motorcyclists). Hence, commercial motorcyclists had more awareness and use of safety glasses than private motorcyclists (193 [54.06%] > [164 [45.94%]]). The researchers attributed this finding to health as everyone wants healthy living instead of motorcycle classification.

The finding of this study showed that there was a difference in the use of safety glasses among motorcyclists based on motorcycle classification. This is attributed to experiencing the daily occupational hazards the respondents; the commercial motorcyclists are likely to use safety glasses daily as they are more exposed to occupational hazards such as flying debris, droplets and dust than private motorcyclists.

Conclusion

The findings have shown that motorcyclists in Dutsin-ma, Metropolis used safety glasses irrespective of their poor level of awareness. The respondents' level of awareness of safety glasses could not induce the use of the safety glasses among them. Awareness and use of safety glasses differed due to motorcycle classification.

Recommendations

1. Motorcyclists in Dutsin-Ma, Metropolis, Katsina State should improve on their awareness of safety glasses for health sake.
2. They should maintain their use of safety glasses.
3. They should improve their awareness of safety glasses to positively influence their use.
4. Private motorcyclists should improve their awareness level and use safety glasses.

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