



## ORIGINAL ARTICLE

## Prevalence and Pattern of Ocular Injuries among Ophthalmic Patients in a Referral Centre, Ekiti State, Nigeria

**Olufemi, O. OYEDIRAN<sup>1\*</sup>, Timothy O. OLADOSU<sup>2</sup>, Omobola K. OIWOH<sup>3</sup>, Emmanuel O. AYANDIRAN<sup>1</sup>, and Iyanuoluwa O. OJO<sup>4</sup>**

<sup>1</sup>Lecturer, Department of Nursing Science, Obafemi Awolowo University, Ile-Ife, Nigeria

<sup>2</sup>Lecturer, Department of Nursing Science, Bowen University, Iwo, Nigeria

<sup>3</sup>Clinical Nurse, Department of Nursing Services, Federal Teaching Hospital Ido-Ekiti, Nigeria

<sup>4</sup>Department of Nursing, University of Ibadan, Nigeria

**\*Corresponding author:** Olufemi O. Oyediran, Lecturer, Department of Nursing Science, Obafemi Awolowo University, Ile-Ife, Nigeria



### Abstract

Ocular injuries are a leading cause of monocular loss of vision. This study aimed to determine the pattern of ocular injuries, identify the most common causes of ocular injuries, assess the pattern of treatment and determine the rate of complications of ocular injuries in Federal Teaching Hospital, Ido-Ekiti, Ekiti State.

A retrospective study was conducted in FTH, Ido-Ekiti, Ekiti State. All patients with ocular injuries from January 2014 to June 2019 were used with a total of 616 patients. Data were obtained with the use of checklist and was analyzed using statistical package of social sciences (SPSS) version 20.0 while descriptive and inferential statistics like frequency distribution, charts and chi-square correlation were used to present the data.

The mean age of the respondents  $22.34 \pm 2.34$  and the prevalence was higher among adults while the common causes identified by the patients were occupational activities, herbal medications, assault/abuse, writing materials, broom sticks and road traffic accident. Corneal scar (29.9%) was the most common complications and there was no significant relationship between the mode of treatment and rate of complications ( $p = 0.430$ ).

The study concluded that male had higher prevalence of ocular injuries than female. Prevalence of ocular injuries was higher in adult than children and occupational activities were identified to be the most common causes of ocular injuries.

### Keywords

Prevalence, Pattern, Ocular injures; Ophthalmic patients, Nigeria

### Introduction

Injuries remain a common problem in the world, occurring in both developing and developed countries. Although injuries accounts for 12% of the global disease burden, about 90% of the global injury burden occurs in the developing countries [1]. Nigeria as a developing nation has a high magnitude of injuries which is only surpassed by the burden of poverty and infectious diseases [2], with a prevalence rate ranging between 24.3% and 31.1% [1,3].

The eyes are the window to the human body representing only 0.27% of the total body surface area and 4% of the facial area, yet it is the third most common organ affected by injuries after the hands and feet [4,5]. Ocular injuries are a preventable public health problem globally with a significant socioeconomic impact. It is responsible for total blindness and monocular blindness in 1.6 million people and 19 million people respectively globally [5,6]. In sub-Saharan Africa however, ocular injuries have been recorded as a singular cause of 3.2%-5.5% of bilateral blindness and 20%-50% of monocular blindness cases [7]. While the pattern and epidemiological characteristics of ocular injuries differs across the country, the visual prognosis depend on the type and nature of the causative agent of the injury, the immediate interventions, financial strength and ability, the time interval between the occurrence and commencement of treatment in

**Table 1:** Socio-demographic characteristics of patients with ocular injuries.

Variables	Frequency (n = 616)	Percentage (100%)
<b>Age (years)</b>		
1-10	58	9.4
11-19	126	20.5
20-29	134	21.8
30-39	164	26.6
40-49	103	16.7
50-59	16	2.6
60 and above	15	2.4
<b>Sex</b>		
Male	386	42.2
Female	230	57.8
<b>Religion</b>		
Christian	359	58.3
Muslim	255	41.4
Others	2	0.3
<b>Highest level of education</b>		
No formal education	10	1.6
Primary education	176	28.6
Secondary education	254	41.2
Tertiary education	176	28.6
<b>Marital Status</b>		
Single	279	45.3
Married	302	49.0
Divorced	7	1.1
Widow/widower	16	2.6
Separated	12	1.9
<b>Occupation</b>		
Student	123	19.9
Civil servant	67	10.9
Trader	87	14.1
Artisan	172	28.0
Business	81	13.1
Unemployed	86	14.0
<b>Ethnicity</b>		
Yoruba	424	68.8
Igbo	133	21.6
Hausa	59	9.6
<b>History of herbal treatment</b>		
Yes	319	51.8
No	297	48.2

the hospital, the management protocol instituted in the hospital [8,9]. Certain occupations, school accidents, domestic accidents and cultural practices have been reported to have direct link with some peculiar ocular injuries in Nigeria [9,10].

This study retrospectively reviews ocular injuries seen at Federal Teaching Hospital, Ido-Ekiti, Ekiti over a 5-year period and determines the pattern, commonly affected and the most common cause, including pattern of treatment and rate of complications.

## Methods

A retrospective study was conducted in FTH, Ido-Ekiti, Ekiti State to evaluate the prevalence of all cases of ocular injuries. Medical records of all patients who received eye care at the Ophthalmic Complex of the hospital from January 2014 to June 2019 who were fitting our criteria were reviewed. A total of 616 cases of ocular injuries were recorded and retrieved. The record department was approached after due process and protocols were observed, with an assurance that the collected data will be used only for the purpose of the research.

A checklist that was developed from an extensive review of relevant literature was used for data collection. Content and face validity of the instrument was ensured. Reliability was obtained using test-retest method by reviewing the case notes of 30 cases of ocular injury in a similar setting, where a reliability coefficient of 0.70 was obtained.

Permission was obtained from the Chief Medical Advisory Committee of the Hospital and ethical approval was also obtained from Human Research and Ethics Committee of FTH, Ido-Ekiti with the approval number ERC/2020/01/08/321A. All the information was kept confidential, and no individual identifiers were collected. The collected data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 (Armonk, NY: IBM Corp). Results were presented using percentages, frequency and tables.

## Results

Table 1 shows the socio-demographic characteristics of patients with ocular injuries in FTH, Ido-Ekiti. 57.8% were females while about half (49%) of the population were married. More than half of the population (51.8%) had a history of use of herbal treatment. Most of the patients were artisan 172 (28.0%), students 123 (19.9%) and traders 87 (14.1%).

Figure 1 shows the prevalence of ocular injuries among respondents. In 2014 the prevalence of ocular among adult affected was substantially high at 21.2% while in 2015 drop marginally by few percentages. However, in 2016 further dropped to 15.3% while in 2017 the prevalence among adult affected went back up after which in 2018 and 2019 the prevalence dropped drastically. Inherently, the prevalence of ocular among children as at 2014 was substantially high even against adult.

Table 2 shows month-wise distribution of the occurrence of ocular injuries. A bimodal distribution of the occurrence of ocular injuries was observed with the first spike between January and March and the second between October and December. Year 2014 recorded the highest occurrence of ocular injuries.

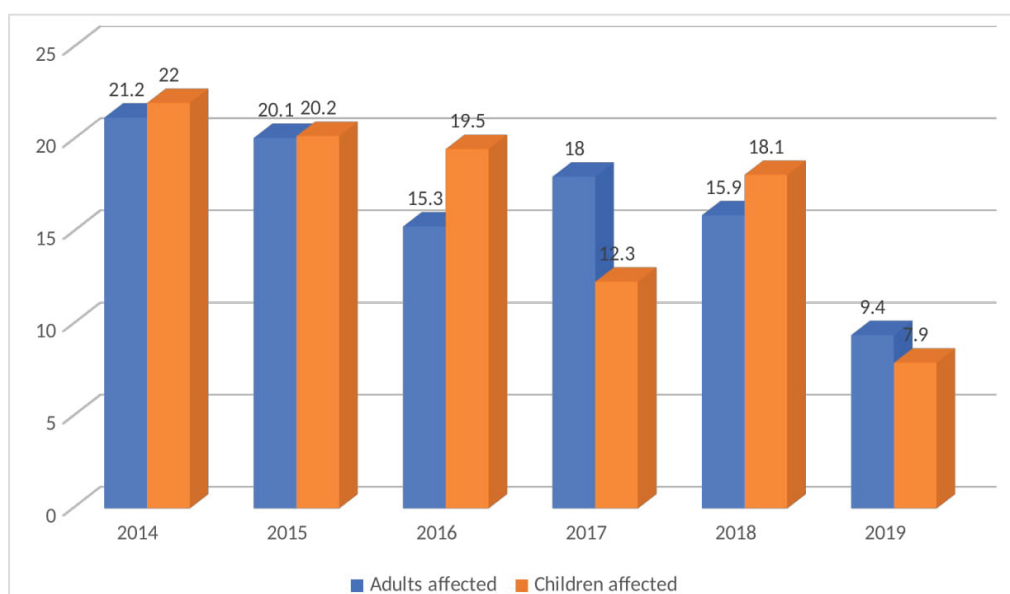
Table 3 shows the common causes of ocular

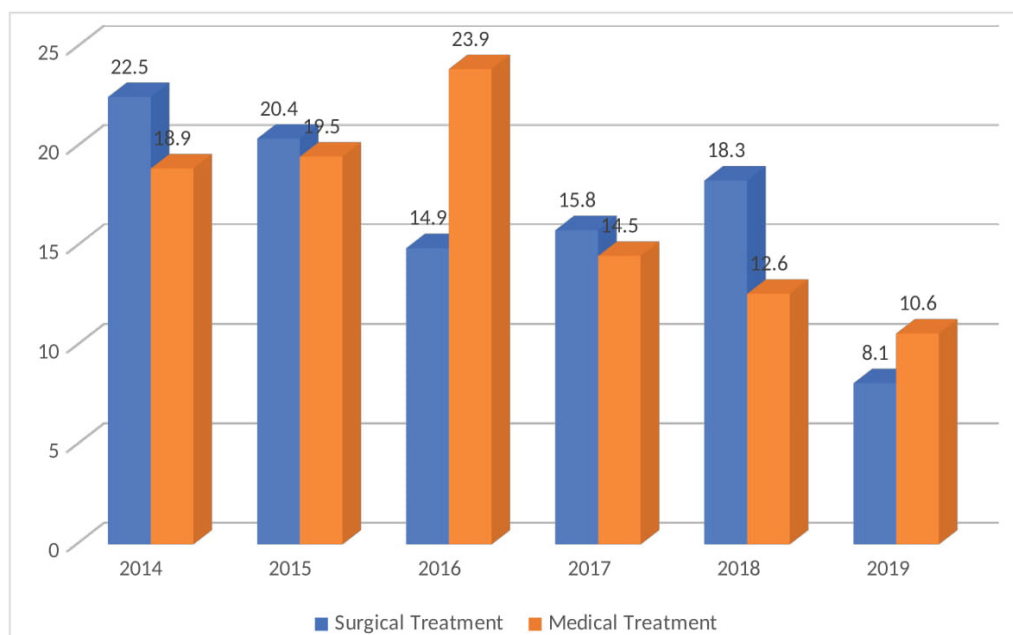
**Table 2:** Month-wise distribution of occurrence of ocular injuries.

S/N	Variables	2014	2015	2016	2017	2018	2019	Total
1	January	15(23.4)	13(20.3)	10(15.6)	7(10.9)	10(15.6)	9(14.1)	64
2	February	13(21.7)	10(16.7)	11(18.3)	10(16.7)	8(13.3)	8(13.3)	60
3	March	16(23.2)	14(20.3)	8(11.6)	10(14.5)	15(21.7)	6(8.7)	69
4	April	6(14.3)	10(23.8)	6(14.3)	8(19)	4(9.5)	8(19)	42
5	May	8(19.5)	7(17.1)	2(4.9)	7(17.1)	7(17.1)	10(24.4)	41
6	June	15(25.9)	9(15.5)	6(10.3)	5(8.6)	10(17.2)	13(22.4)	58
7	July	6(21.4)	4(14.3)	5(17.9)	6(21.4)	7(25)	-(0)	28
8	August	6(15)	10(25)	9(22.5)	10(25)	5(12.5)	-(0)	40
9	September	5(11.9)	12(28.6)	12(28.6)	8(19)	5(11.9)	-(0)	42
10	October	14(24.6)	16(28.1)	12(21.1)	3(5.3)	12(21.1)	-(0)	57
11	November	17(27.9)	10(16.4)	16(26.2)	10(16.4)	8(13.1)	-(0)	61
12	December	12(22.2)	9(16.7)	9(16.7)	11(20.4)	13(24.1)	-(0)	54
<b>Total</b>		<b>133</b>	<b>124</b>	<b>106</b>	<b>95</b>	<b>104</b>	<b>54</b>	<b>616</b>

**Table 3:** Common causes of ocular injuries.

S/N	Variables	2014	2015	2016	2017	2018	2019	Total
1	Broken Plates/Glasses	4(16.7)	7(29.2)	2(8.3)	6(25)	5(20.8)	0(0)	24
2	Broom Sticks	17(23)	14(18.9)	10(13.5)	11(14.9)	15(20.3)	7(9.5)	74
3	Road Traffic Accident (RTA)	2(4.2)	7(14.6)	12(25)	6(12.5)	18(37.5)	3(6.3)	48
4	Toys	7(21.2)	3(9.1)	10(30.3)	7(21.2)	2(6.1)	4(12.1)	33
5	Cutleries	3(16.7)	4(22.2)	5(27.8)	3(16.7)	3(16.7)	0(0)	18
6	Writing materials	22(24.2)	15(16.5)	12(13.2)	17(18.7)	15(16.5)	10(11)	91
7	Social/sport events	2(13.3)	5(33.3)	3(20)	0(0)	5(33.3)	10(62.5)	25
8	Fight	2(10.5)	4(21.1)	2(10.5)	5(26.3)	6(31.6)	0(0)	19
9	Assault/Abuse	4(10.9)	4(10.9)	10(21.7)	9(19.6)	10(21.7)	6(15.2)	46
10	Occupational activities	41(28.2)	35(24.2)	20(14.1)	21(14.8)	14(10.1)	12(8.7)	149
11	Gun shot	1(6.3)	0(0)	2(12.5)	0(0)	3(18.8)	0(0)	6
12	Herbal medications	18(27.7)	14(21.5)	11(16.9)	9(13.8)	5(7.7)	8(12.3)	65
13	Fall	8(29.6)	10(37)	6(22.2)	0(0)	2(7.4)	1(3.7)	27
<b>Total</b>		<b>133</b>	<b>124</b>	<b>106</b>	<b>95</b>	<b>104</b>	<b>54</b>	<b>616</b>

**Figure 1:** Age pattern of Ocular injuries among the Respondents.



**Figure 2:** Mode of Treatment for Ocular Injuries.

**Table 4:** Pattern of complications following treatment.

S/N	Variables	2014	2015	2016	2017	2018	2019	Total
1	Sympathetic Ophthalmitis	12(17.4)	8(11.6)	12(17.4)	17(24.6)	13(18.8)	7(10.1)	69
2	Iridodialysis	10(31.3)	11(34.4)	5(15.6)	5(15.6)	8(25.0)	0(0.0)	39
3	Traumatic cataract	21(21.2)	25(25.3)	16(16.2)	12(12.1)	12(12.1)	13(13.1)	99
4	Corneal scars	31(16.8)	39(21.2)	45(24.5)	20(10.9)	29(15.8)	20(10.9)	184
5	Secondary glaucoma	16(34.0)	9(19.1)	8(17.0)	6(12.8)	7(14.9)	1(2.1)	47
6	Endophthalmitis	19(22.6)	17(20.2)	8(9.5)	20(23.8)	16(19.0)	4(4.8)	84
8	Retinal detachment	3(11.5)	5(19.2)	2(7.7)	0(0)	16(61.5)	0(0)	26
9	No complication	21(26.9)	15(19.2)	10(12.8)	7(8.9)	16(20.5)	9(11.5)	78
	Total	133	124	106	95	104	54	616

**Table 5:** Significance relationship between mode of treatment and rate of complications.

Variables		N	$\bar{x}$	SD	Df	t	P-Val
Rate of complication	Surgical treatment	229	116.40	30.02	614	0.626	0.430
	Medical treatment	387	215.18	29.15			

{t (216) = 0.626, p > 0. 05}

injuries. From the table above, in order of magnitude or frequency occupational activities had the highest common causes of ocular injuries, followed by writing material, broom stick, RTA, Assault/Abuse and toys respective were majorly the causes of ocular injuries. Inherently occupational activities were the major causes of ocular injuries from the years 2014 to 2017. In 2018, RTA was the major cause of ocular injuries while in 2019 occupational activities was the major cause of ocular injuries.

Table 4 shows the pattern of complications. In this review, corneal scar was the most common complications with 184 cases (29.9%), followed by traumatic cataract (99 cases). Imperatively, only 78 cases were with no complication.

Figure 2 shows the mode of treatment of ocular injuries. Higher number of ocular injuries in 2014, 2015, 2017 and 2018 were managed by surgical intervention while majority of ocular injuries in 2016 and 2019 were managed medically.

Hypothesis Testing: There is no significance difference between mode of treatment and rate of complication. Table 5 shows that mode of treatment (surgical treatment and medical) have no influence on productivity {t(614) = 0.626, p > 0.05}. Furthermore, medical treatment (N = 387,  $\bar{X}$  = 215.18, SD = 29.15) display significant higher rate of treatment of ocular than surgical treatment (N = 229,  $\bar{X}$  = 116.40, SD = 30.02). Based on this result, there was no significant relationship between the mode of treatment and the rate of complications.

## Discussion

This study revealed that male 386 (62.7%) had higher prevalence of ocular injuries than their female 230 (37.3%) counterparts with a ratio of 1.7:1. The predominance of males to ocular injuries is similar to report of other studies, such as 1.7:1 in pediatrics and 1.23:1 in geriatrics in Aba State, Nigeria (10); 5.1:1 in Zamfara State, Nigeria (6); 3.4:1 in Ondo State, Nigeria (5). This higher frequency of male gender could be as a result of the adventurous and aggressive nature of male to female gender and the propensity of males to get involve in risky occupational activities.

The occurrence of ocular injuries recorded higher frequency between 11 and 49 years, constituting 85.6% of the subjects. These were the young and active age group and are of great concern as it comprises the active working age group who drives the economy of the society. Our findings were similar to what was reported in other studies [5,6]. The predominance of Yorubas and Christians in this study is a reflection of the predominance in the community. More than half of the respondents (51.8%) had herbal treatment history and majority of the respondents were artisan. This may not be unconnected with the study center which although is a tertiary healthcare facility with referrals from lower cadres of healthcare, is situated in a rural area.

There seem to be a close distribution of ocular injuries across the months of the year. The highest distribution of ocular injuries was found in the month of March with 69 cases which constitutes 11.2% of the total cases. The first quarter (containing January, February and March) had the highest spike with 193 cases with 31.3% of the total cases. Months in the dry season (November-March) appears to having higher occurrences of ocular injuries but actually shared 50% of the distribution, despite having fewer months than the rainy season.

This result is in contrast with a similar result in Northern India who reported a bimodal distribution with first spike between April and June and second between August and October [11]. The year 2014 had the highest occurrence of ocular injuries in the hospital. This finding may be attributed to the fact that the gubernatorial elections in the State in the year.

About a quarter (26.6%) of the patients seen with ocular injuries were in the 30-39 year's age group followed by 20-29 years age group (21.8%) and 11-19 years age group (20.5%). This is in keeping with a Ghanaian study where 27.42% of ocular trauma patients were between 20- and 29-years age bracket and 21.05% were in the 30-38 year's age group [12].

This study identified occupational activities as the overall commonest cause of ocular injuries 149 (24.2%). It was equally the leading cause of ocular injuries from 2014 to 2017 and 2019. This is not too far from the report of Desai, et al. where workplace accounted for 19.6%

of the place of injury occurrence [13]. In a similar study in Singapore, work-related injury accounted for 71.4% cases of ocular trauma [14]. This result draws attention to the need for intense advocacies for occupational safety and health in the catchment areas of the hospital. This is important to forestall the debilitating effect ocular injuries in terms of cost and outcome.

In our review, the most common intervention rendered to patients with ocular injuries was surgical management 457 (74.2%). This is consistent with a study in Hawassa, Ethiopia who reported that 53.17% had ocular surgery secondary to ocular trauma [15]. However, this is in contrast with the study of [11,12] where 243 (64.5%) receive medical treatment only and nearly 50% of patients were medically treated respectively. Corneal scar was the most common complications in the years under review, which account for 184 (29.9%) cases. This is similar to the report of review of ocular trauma in a neighboring country, Ghana where 30% of the cases had corneal opacities/scars following medical interventions following ocular injuries [12]. In this study, only 78 (12.7%) cases were successfully managed without complication, this is at variance with the result of Maurya, et al. where 79.4% of the cases were successfully managed [11]. It is worthy of note that there was no significant relationship between the mode of treatment and rate of complications ( $p = 0.430$ ).

## Conclusion

The study concluded that male had higher prevalence of ocular injuries than female and ocular injuries were higher in adult than children with occupational activities; broken plates or glasses; broom; RTA; toys; cutleries; writing materials; social or sport events; fight; assault or abuse; gunshot; herbal medications as the common causes of ocular injuries. Therefore, there is a need to urgently arrest the alarming increase of ocular injuries by ensuring the use of safety devices like goggles, gloves, etc and also promote occupational safety practices.

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## Conflict of Interest

No any form of conflict of interest regarding this manuscript.

## Authors Contribution

Olufemi, O. OYEDIRAN: Involved in study conceptualization/design, data collection and drafting of the manuscript

Timothy O. OLADOSU: Involved in drafting of manuscript

Omobola K. OIWOH: Involved in involved in data collection and data analysis

Emmanuel O. AYANDIRAN: Involved in critical review of the manuscript and proof reading

Iyanuoluwa O. OJO: Involved in drafting of manuscript and editing

## Authors Statement

This is to state that the manuscript has been read and approved by all the authors and all authors met the requirements for authorship and that each author believes that the manuscript represents honest work of all the contributors.

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