

PREVALENCE OF OCULAR FOREIGN BODIES AMONG PATIENTS RECEIVING HEALTH CARE SERVICES AT JINJA REGIONAL REFERRAL HOSPITAL EYE CLINIC JINJA, UGANDA. A CROSS-SECTIONAL STUDY.

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Page | 1

ABSTRACT

Purpose of the study

The purpose of the study was to determine the prevalence of ocular foreign bodies among patients receiving health care services at JRRH to provide a baseline source of data for public education.

Objectives

The general objective was to determine the prevalence of OFBs among patients receiving health care services seen at the eye department of JRRH and the specific objectives were to determine the predisposing causes to OFBs, the possible treatment, and the complications of OFBs among patients receiving health care services at JRRH.

Study methodology

The study adopted a cross-sectional quantitative research design. Simple random sampling methods were used to select respondents who participated in the study and a total of 40 respondents were interviewed. Self-administered questionnaires were used to collect data from the respondents.

Results

During the study, it was found that farming was the most common activity carried out by respondents at the time they sustained ocular foreign body constituting 30% (12/40) of all activities resulting to the vegetative type of foreign body on lead, 55%. The majority of the respondents were from the rural 65% and 35% from urban settings, with the most affected age being 20-25 years.

Conclusions

In JRRH, the prevalence of OFB among patients is high with the majority of the cases being easily treatable with good prognosis.

Recommendation

The study recommends using eye protective gear by people involved in activities where OFBs may traumatize their eyes.

Health education on OFBs should be adopted by the relevant authorities that is the DHECT.

Training of more eye health workers should be done by the Government to technically manage OFBs.

Keywords: *Ocular Foreign Bodies, Jinja Regional Referral Hospital, Eye Clinic.*

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Background to the study

According to Achyut, 2017, An ocular foreign body (OFB) is any abnormal substance or object that does not belong to the eye. Foreign bodies in the eye can be extraocular FB or intraocular.

Globally, in a study done in the USA, according to a report by the World Health Organization (WHO), the incidence of ocular injuries is 2.4 million cases. IOFBs account for 17 to 41% of open injuries. The majority of IOFBs occur in young working males. Home-related works account for only a minority of 13% of injuries. According to Gupta & Tripathy, 2024 Workers, and farmers are the two most common occupations because they are involved in hammering, drilling, chiseling, and shoveling. These activities generate more ocular foreign bodies. (Gupta & Tripathy, 2024a) The annual incidence rate of IOFBs is

approximately 0.16 per 100,000 in the United Kingdom. Thus adequate safety measures at work should be taken (Canner et al, 2020).

In China, some studies show that intraocular foreign bodies (IOFBs) account for 18–41% of all open-globe injuries seen in eye care clinics.

In Africa, a study carried out among industrial welders in Port Harcourt, Nigeria, records the prevalence of work Three hundred and one welders (60.2%) had either a history or evidence of ocular FB, the chief source of FB as reported by the welders were metal chips and arch rays. Of the 40 welders who had physical evidence of FB, the commonest ocular FB, in decreasing frequency, included corneal opacities (n=25, 62%), corneal foreign body (n=9, 22%), traumatic mydriasis (n=1, 3%). There was a high level of awareness of the risk of sustaining an injury from

welding (n=490, 98%), but only 46(15.3%) of the welders were using protective eyewear at the time of injury.

In East Africa, a study in Tanzania in comparison to other countries like Croatia and Scotland, the prevalence of extraocular foreign bodies varies considerably. About 55 million ocular injuries with ocular FB inclusive occur annually, resulting in 16 million cases of bilateral blindness and 19 million cases of unilateral blindness. It has also been calculated that the annual rates are from 490 to 975 per 100,000 persons. The yearly incidence of cases requiring hospital admission is 8-57 cases per 100,000, and it has been estimated to be high at 12.6 in Singapore, 8.1 in Scotland, 8.3 in Tanzania, and 23.9 in Croatia.

In Uganda, a study was carried out on small-scale welders in Katwe, Kampala, and Atukunda, (2019) Welders are at high risk of eye injuries such as ocular foreign bodies, traumatic iritis due to flying metal chips, and thermal burns.

In JRRH, records obtained from HMIS in January, (2019), show an increase in ocular FB cases from 152 in 2018 to 187 in 2019.

Thus this study contributes to adding that the prevalence of ocular foreign bodies among patients carries a common understanding of health. The general objective of the study was to determine the prevalence of OFB among patients receiving health care services at JRRH eye clinics.

Specific objectives.

1. To find out the predisposing causes of ocular foreign bodies among patients receiving healthcare services at JRRH eye clinic.
2. To find out the possible treatment of ocular FBs among patients receiving healthcare services at JRRH eye clinic.
3. To find out possible complications of ocular foreign bodies among patients receiving healthcare services at JRRH eye clinic.

METHODOLOGY

Study design

A cross-sectional quantitative study was conducted because data was collected at one point in time. Cross-sectional studies were also relatively expensive and took up little time to conduct. (Thomas, 2020)

Study area.

The study was carried out in the Jinja Regional Referral Hospital Eye Clinic because it had more eye patients. Jinja Regional Referral Hospital receives many patients from different areas of Busoga and the area is easily accessible. The study was carried out in JRRH located in the heart of Jinja city, not far from the source of the Nile. The hospital is located approximately 84km East of Mulago Referral Hospital. The coordinates of JRRH are: latitudes 0.431111; and longitude: 33.205000. The study was carried out from June 2023 to December 2023.

Study population.

The study was carried out among patients diagnosed with ocular foreign bodies receiving healthcare services at

JRRH eye clinic and only those who had consented to the study.

Sample size determination.

The sample size was determined using the method below; Sample size, $S = GR/O$ (Button's 1995).

Where S = sample size,

G = Number of people interviewed per day,

R = Maximum number of days for the data collection,

O = Maximum time an interview spends on each patient,

$G = 4$ people

$R = 5$ days

$O = (30/60) = 0.5$ hours

Therefore, $S = (4 \times 5) / 0.5 = 40$ respondents.

Sampling technique.

A simple random sampling was used because each member in the sample group had an equal chance of being selected.

Sampling procedure.

A simple random sampling technique was used to pick 40 respondents. Because everyone in the target group had equal chances of being included in the study, 8 small papers bearing yes or no were distributed to them in the eye clinic each day for 5 days. Only 4 respondents were picked each day making a total of 40 respondents who picked yes papers were included in the study in 5 days.

Data collection method.

A survey method was used, and data was collected using a quantitative method specifically through the use of questionnaires. The study employed questionnaires because they have equal chances to respondents and results can be generated.

Data collection tool.

Pre-tested structured Questionnaires were used. The questionnaires were written in English and constructed along with the specific objectives of the study. Questionnaires were specifically chosen because of their ability to collect data quickly, keep respondents anonymous, collect accurate data and it is also cost-saving (Stefan, 2022).

Data collection procedure.

The researcher started by creating rapport with the respondents and reassuring them about confidentiality. The questions from the questionnaires were read and interpreted for the respondents to understand. Answers were given by respondents at the end the respondents were thanked for their cooperation.

Independent variable

Prevalence of ocular foreign bodies.

Dependent variable

Ocular foreign bodies in patients.

Quality control.

To ensure quality in this study the researcher’s instruments were pretested to predict its accuracy, reliability, and consistency. The instruments were also looked at by other research experts.

Pretesting of research tools.

The study tool was tested on a few patients attending the eye clinic and necessary adjustments were made to ensure validity and reliability. The patients included in the study consented, those excluded were those without ocular foreign bodies and those who did not consent to participate in the study.

Training of research assistants

A research assistant was trained, questionnaires were translated into Luganda and pretested and patients confidentially was kept.

Piloting the study.

I visited the eye clinic at JRRH to obtain permission from the head of the department. I introduced myself to the staff and relevant authorities to ascertain the relevance of the study. I was assured of the presence of ocular foreign

bodies and that my designed objectives were realized depending on the information and results I got.

Inclusion criteria.

Only patients with ocular foreign bodies receiving healthcare services in the eye clinic at JRRH who had consented to participate in the study were included.

Data analysis and presentation

Completed questionnaires were edited for accuracy, and consistency, and analyzed using Microsoft Excel and Microsoft Word, the data collected was presented in tables and figures using frequencies and percentages and some pie charts.

Ethical considerations

The study was approved by the school research committee, a letter of introduction was provided by the principal ophthalmic clinical officer’s school and it was delivered to the hospital Director who introduced me to different in-charges of the ophthalmic unit.

He introduced the researcher to the respondents to get their consent. The respondents were assured of absolute confidentiality.

RESULTS

Table 1: Socio-demographic characteristics of the respondents (n=40)

Responses	Frequency (n=40)	Percentage %
Age(years)		
20-25	20	50
26-30	12	30
31-35	6	15
36years and above	2	5
Total	40	100
Sex		
Male	28	70
Female	12	30
Total	40	100
Residential Area		
Rural	26	65
Urban	14	35
Total	40	100
Education level		
Primary	14	35
Secondary	8	20
Certificate	6	15
Diploma	5	12.5
Degree	2	5
Nil	5	12.5
Total	40	100
Occupation		
Civil servant	-	0
Business person	7	17.5
Peasant	12	30
Housewife	-	0
Builder	4	10
Factory worker	4	10

Welder	8	20
Carpenter	3	7.5
Saw miller	2	5
Total	40	100

From the table above, 15 (50%) of the respondents were between 20-25 years, 12 (30%) were between 26-30 years, 6 (15%) were between 31-35 years while the minority 2 (5%) were 36 and above years.

The majority of respondents were males 28 (70%) and 12 (30%) were females.

On residential, most of the respondents 26 (65%) were from rural settings while the least 14 (35%) were from urban settings.

Education level of the respondents established that 14 (35%) of the respondents were primary school dropouts, 8 (20%) had attained secondary, 6 (15%) were of certificate level, 5 (12.5%) were of diploma level, 2 (5%) were of degree level of education while 5 (12.5%) had not attained any level of education.

On occupation, None of the respondents was a civil servant or housewife, 7 (17.5%) were business people, 12

(30%) were peasants, 4 (10%) were builders, 3 (7.5%) were carpenters while 2 (5%) were saw millers.

Common causes of ocular foreign bodies among patients receiving health care services at Jinja Referral Hospital.

The first objective was to determine the possible causes of ocular foreign bodies among patients receiving health care services at JRRH. The aim of the principal investigator was interested in finding and determine what was causing ocular foreign bodies.

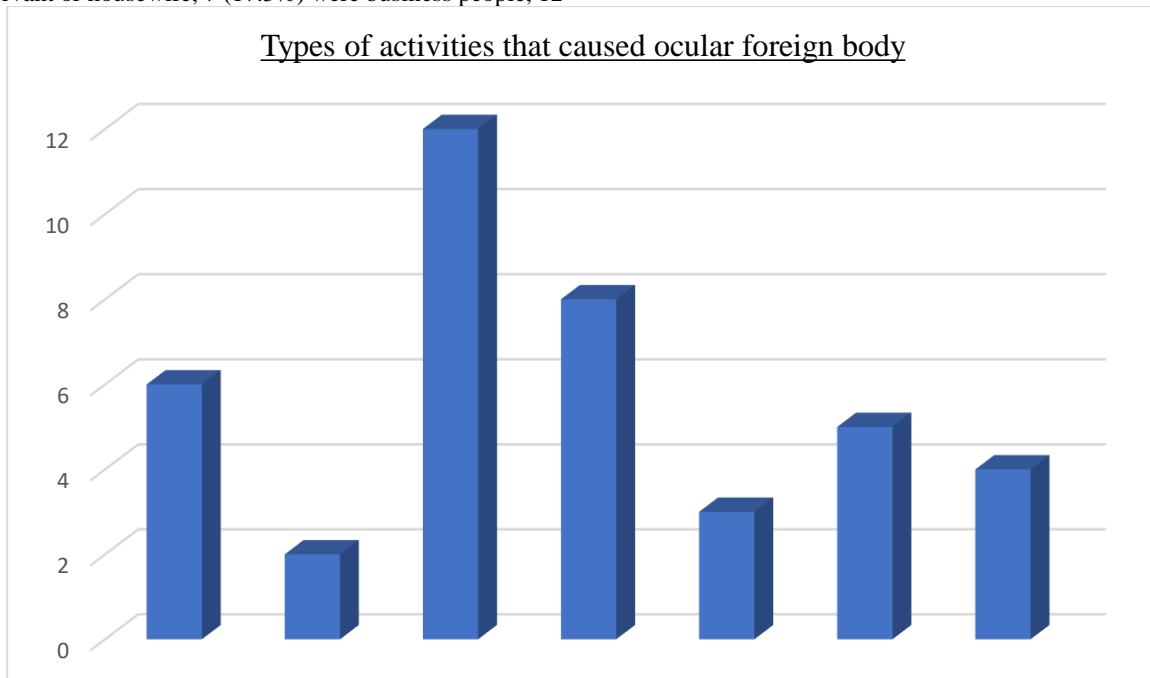


Figure 1 shows the type of activities that caused ocular foreign bodies among Patients who presented to the eye clinic during the study.

Patients took different activities at the time they sustained ocular foreign body, majority carried out farming 12

(30%) some were carrying out hammering 6 (15%), those who carried out chiseling were 2 (5%), 8 (20%) carried out welding, 3 (7.5%) carried out the drilling activity, 5 (12.5%) were involved in sawmilling and others that were involved in activities such as working in sugar cane factories were 4 (10%).

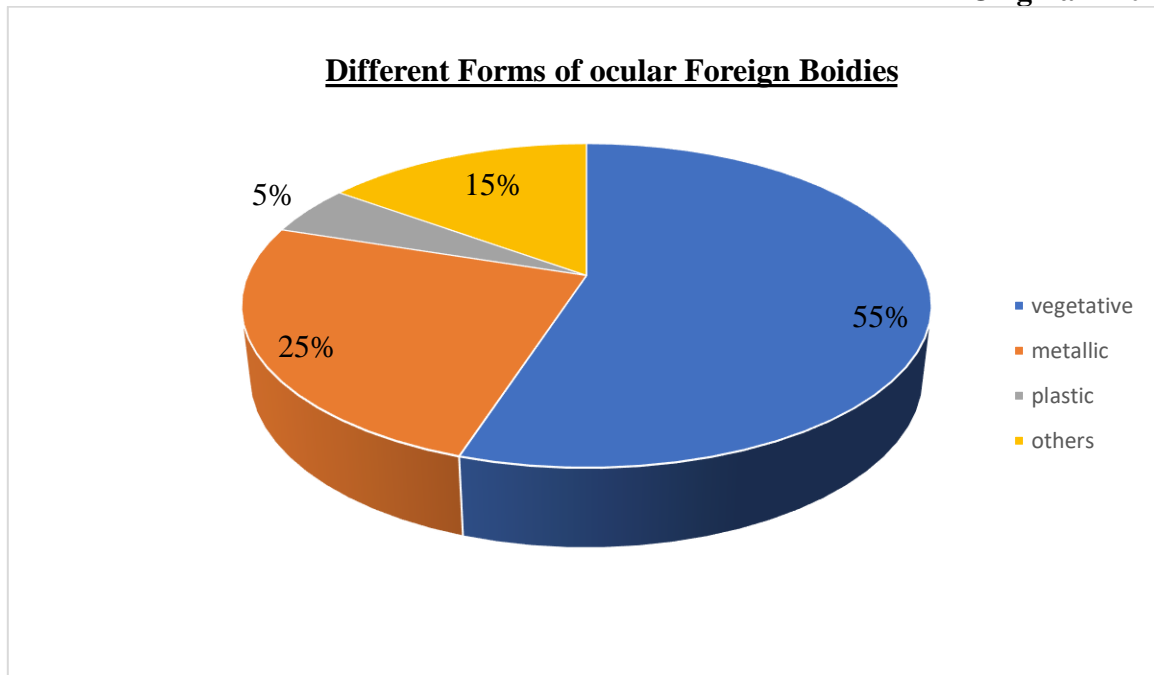


Figure 2 shows the different forms of ocular foreign bodies among patients receiving health care services at Jinja Regional Referral Hospital.

Ocular foreign bodies were caused by a different form of materials, majority were caused by vegetative materials

22 (55%) such as grass, small sticks, banana fiber, and sugar cane materials, 10 (25%) were caused by metallic forms majorly doing welding activities, 2 (5%) were in plastic form got while doing plastic pipe cutting and during factory activities and 6 (15%) were other forms like stones.

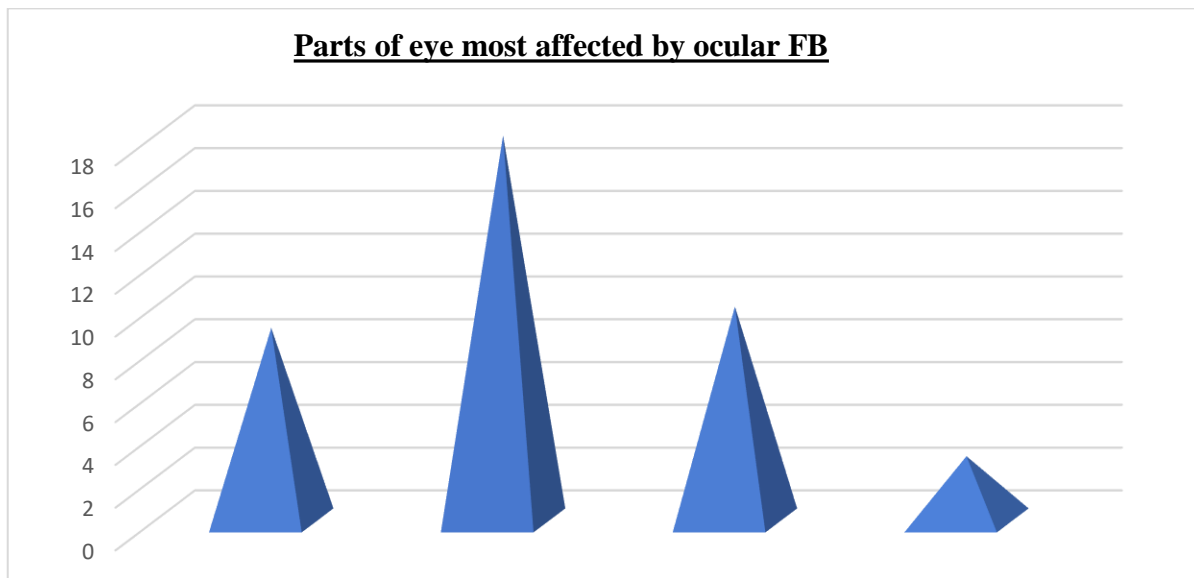


Figure 3 shows the different parts of the eye that are most affected by ocular foreign bodies among patients receiving health care services at Jinja Regional Referral Hospital.

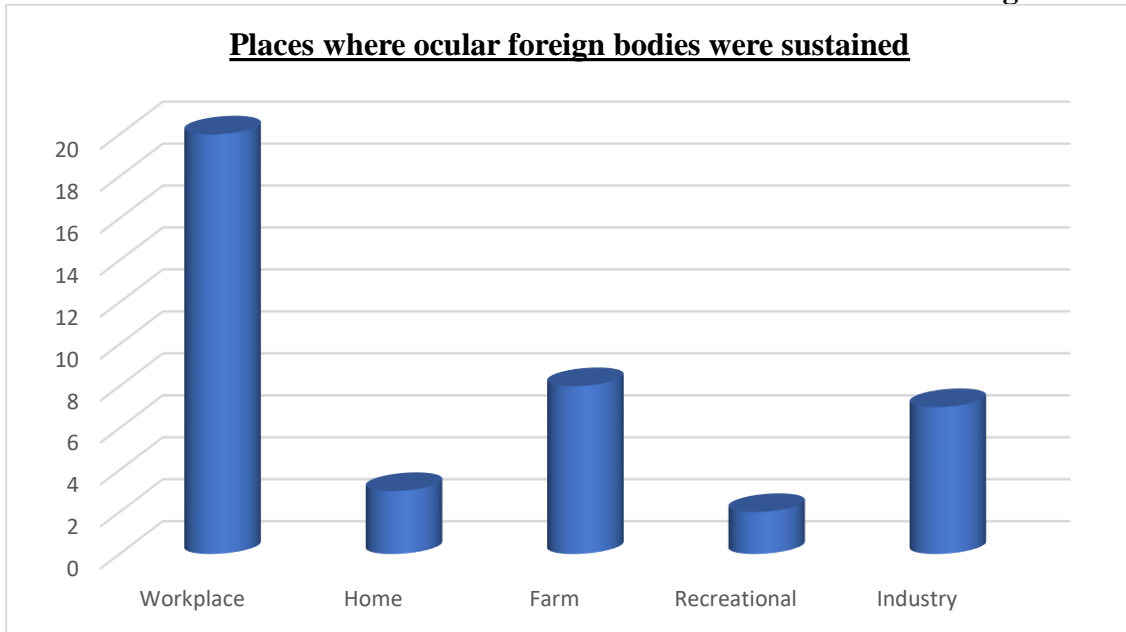


Figure 4 shows the places where different ocular foreign bodies were sustained among Patients who presented to the eye clinic during the study.

Results and evidence from ocular examination show that the majority of foreign bodies were found in conjunctiva 18 (45%), followed by cornea 10 (25%), eyelids 9 (22.5%), and others 3 (7.5%).

Most foreign bodies were sustained in the workplace 20 (50%), 3 (7.5%) were sustained at home, 8 (20%) on the

farm, 7 (17.5) in the industries, and the least were sustained during recreational activities 2 (5%).

Occurrence of ocular foreign body.

The principal investigator was interested in establishing the occurrence of ocular foreign bodies and Table 2 shows the occurrence of ocular foreign bodies to relate to the causes of ocular foreign bodies and their management.

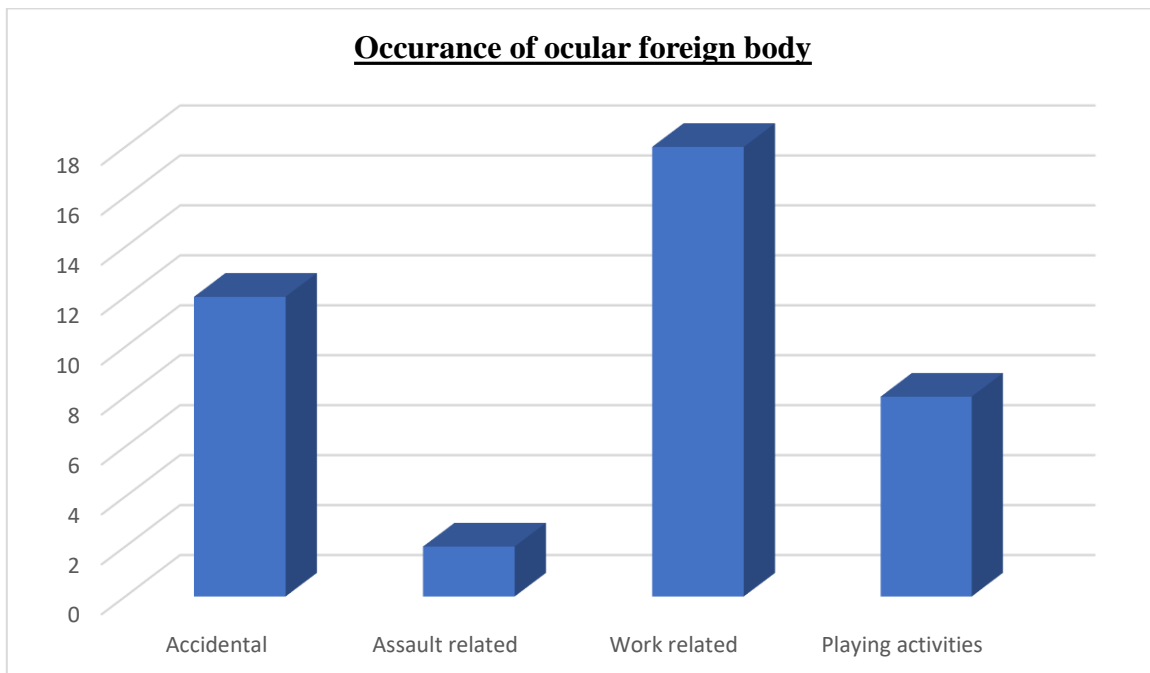


Figure 5 shows the occurrence of ocular foreign bodies among Patients who presented to the eye clinic during the study.

Most foreign bodies during work-related 18 (45%), accidentally 12 (30%), 2 (5%) were assault-related and 8 (20) occurred during playing activities.

Treatments of ocular foreign bodies.

The second objective was to determine the treatment of ocular foreign bodies among patients receiving healthcare services at JRRH

Table 2: Shows the different types of ocular foreign treatment body treatment received by patients getting health care services at JRRH.

Ocular foreign body treatment	n=40	Percentage (%)
Medical treatment	13	32.5
Foreign body removal	17	42.5
Surgical repair	08	20
Debridement	02	5

Results show that the majority of patients who presented to the eye clinic received foreign body removal 17 (42.5%), 13 (32.5%) received medical treatment, 8 (20%) received surgical repair of major eyelids, and the least received 2 (5%) surgical debridement.

Among those that received medical treatment, they were managed as shown in the figure below.

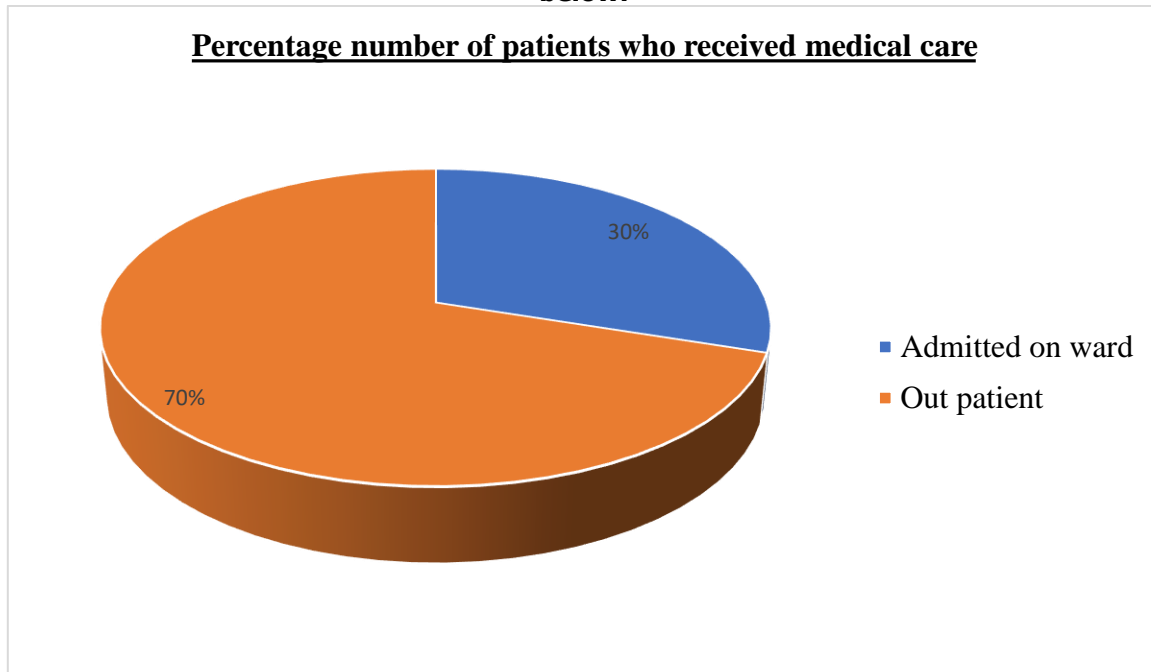


Figure 6 shows the percentage number of patients who receive medical treatment among patients receiving health care services at Jinja Regional Referral Hospital.

Among those who received medical treatment, 12 (30%) were admitted to the eye ward for continuous monitoring, 28 (70%) were treated as outpatient.

Time of presentation to eye clinic.

The principal investigator wanted to determine the time of presentation to the clinic from the time of occurrence of incidence about possible suitable treatment of the ocular foreign body.

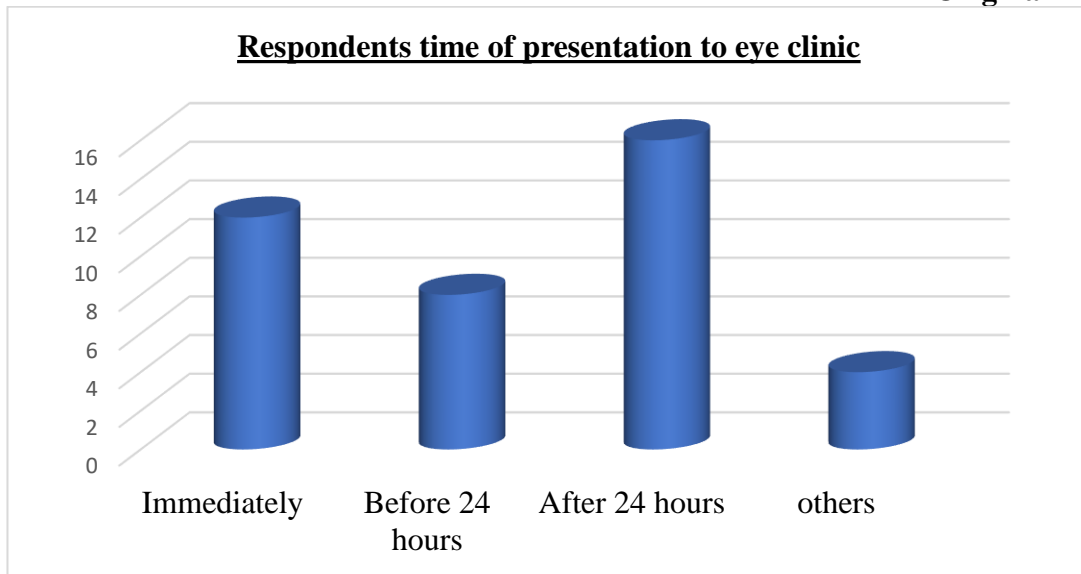


Figure 7 shows the time of presentation to the eye clinic by the respondents.

Time of presentation to eye clinic after sustaining foreign body were as follows, 12 (30%) presented immediately,

8 (20%) before 24 hours, 16 (40%) after 24 hours and others did not specify how long they took to present to eye clinic 4 (10%)

Complications of ocular foreign bodies.

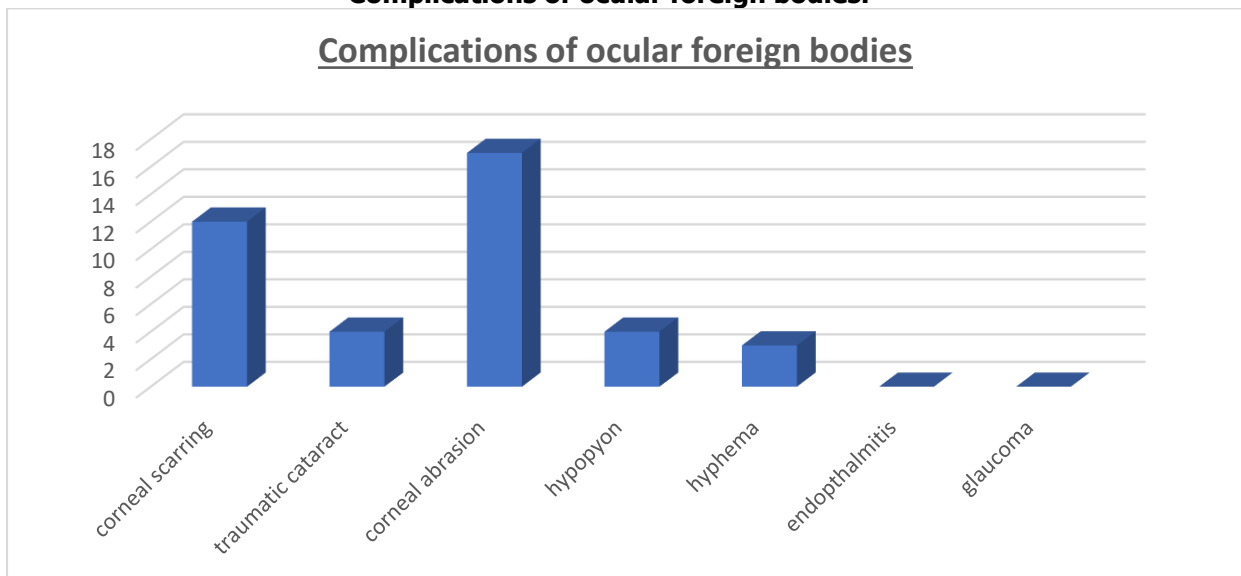


Figure 8 shows the complications of ocular foreign bodies among patients receiving health care services at JRRH.

Most of the patients who participated in the study agreed to have witnessed corneal abrasion as the most common ocular FB complication 17 (42.5%), followed by those that had witnessed corneal scarring 12 (30%), then traumatic cataract 4 (10%), hypopyon was 4 (10%), hyphema was witnessed by 3 (7.5%) and none of participants had witnessed endophthalmitis or glaucoma.

Discussions.

Socio-demographic data

The findings from socio-demographic data revealed that the majority of respondents were between the age group of 20-25 years 20 (50%), followed by those in the age group of 26-30, 12(30%), 31-35 6 (15%) and least number of respondents belonged to the age group of 36 years and above 2 (5%). This is probably because the early youth age tends to take part in many active activities that make them more prone to sustaining ocular foreign bodies.

The results revealed that males accounted for 28 (70%) and females at 12 (30%). This could be probably because most males take part in physical activities like games, welding, and farming making them more prone to ocular

foreign bodies than their female counterparts. In a study conducted by Minjie (2022), these findings do not dissociate much from this study's findings.

The majority of respondents lived in rural areas 26 (65%) and a few lived in urban areas 14 (35%). Living in rural areas predisposes one to ocular trauma as they take part in physical activities like farming, and collecting firewood. Results on education level show that the majority of respondents had only attained primary education 14 (35%) followed by those who had attained secondary education 8 (20%), and the least number of respondents had attained degree level of education 2 (5%).

On occupation, results revealed that the majority of respondents were peasants 12 (30%), followed by those who took part in welding activities 8 (20%), 4 (10%) took part in factory work and building, then 3 (7.5%) took part in carpentry and least number of respondents took part in sawmilling. This is probably because the most common activity carried out in rural areas is farming for food and for sale.

Predisposing causes ocular foreign bodies among patients receiving health care services at JRRH.

The objective of the study was to find out the predisposing causes of ocular foreign bodies among patients receiving health care services at JRRH. Data analysis and interpretation revealed the following major findings under the objective. It revealed that majority of foreign bodies were generated during farming activities 12/40 (30%) this is because farming is most common activity carried out in village setting, and then welding activities 8/40 (20%), hammering 6/40 (15%), sawmilling 5/40 (12.5%), others generated 4/40 (10%), drilling 3/40 (7.5%) and chiseling generated least foreign bodies 2/40 (5%). The findings also suggested different forms of material that caused ocular foreign bodies as below, the majority were in vegetative form 22/40 (55%) followed by metallic 10/40 (25%), then plastic 2/40 (5%), and others who were not specified constituted to 6/40 (15%). These ocular foreign bodies were mostly sustained in workplaces at about 50%, followed by those sustained at farms during farming activities at about 20%, then industries which constituted 17.5%, 7.5% were at home doing home activities, and recreational activities contributed about 5% of the foreign bodies. The affected parts of the eye included eyelids at 22.5%, conjunctiva at 45%, cornea at 25%, and others that were not specific constituted 7.5%. The occurrence of ocular foreign body incidence was major work related to about 45%, then accidental 30%, playing activities constituted about 20% and assault-related constituted the least 5%.

This is probably because farming is a major activity done by people in rural areas as a way of earning a living and for the production of food for home consumption constituting to major activity that caused many ocular foreign bodies, these foreign bodies were majorly in vegetative form and other forms that was not easily classified like charcoal particles. welding is also a common activity carried out in both rural and urban settings constituting to second activity that generates more

foreign bodies majorly in metallic form and other activities such as hammering, sawmilling, drilling, and chiseling generate the least ocular foreign bodies this is because these activities are undertaken by list number of people in communities most especially factory workers resulting into plastic, a metallic form of foreign bodies. These findings agree with (Gupta & Tripathy, 2024b) who showed that most ocular foreign bodies were sustained during activities like hammering, and sawmilling.

Treatment of ocular foreign bodies among patients receiving health care services at JRRH.

The second objective of the study was to find out possible treatments for ocular foreign bodies. It revealed that the majority of the patients who presented to the clinic during the study 17 (42.5%) needed foreign body removal followed by those who only needed medical treatment 13 (32.5%) then those who needed surgical repair 8 (20%) and those that needed debridement were 2 (5%). The study finds also the involved time at which the patients presented to the eye clinic and was found that 12 (30%) presented immediately, 8 (20%) before 24 hours, 16 (40%) presented after 24 hours, and 4 (10%) others that were not categorized above. These findings indicated that some patients who required medical treatment were admitted 5 (38.5%) due to the severe damage caused by a foreign body that needed monitoring and some were treated as outpatients 8 (61.5%) since these cases did not require medical follow-up up, those patients that required surgical repair involved those with eyelid tear majorly those who were assaulted and those that required debridement were those that had nonhealing corneal ulcer as a result of foreign body damage. The study findings also revealed that most patients presented to the clinic after 24 hours 16(40%) compared to those that presented immediately 12 (30%) indicating that most of the patients presented late which somehow affected their management keeping in line with the study conducted by Asaminew et al., 2009 in Jimma university in Ghana and showed a delayed presentation of patients to the clinic which affected their management.

As part of the management of the patients who presented to the clinic during health education, most patients showed that they did not have any knowledge of eye protection wears like goggles thus indicating that there is a need for the increased sustention of eye protection wear in the community as one of the preventive management of ocular injuries.

Complications associated with ocular foreign bodies among patients receiving health care services at JRRH.

The objective of the study was to find out complications of ocular foreign body. Data analysis and interpretation revealed the following major findings under objective. It revealed that the majority of patients had witnessed corneal abrasion 17 (42.5%) followed by those that had witnessed corneal scarring 12 (30%), then 4 (10%) had witnessed traumatic cataracts caused by ocular foreign body and 4 (10%) had witnessed hypopyon induced by

foreign body and least had witnessed hyphema 3 (7.5%), Non of patients had witnessed end ophthalmitis and glaucoma. The cornea is very sensitive and more exposed making it more prone to damage by foreign bodies thus more complications were registered in the cornea (corneal abrasion and corneal scarring). These findings agree with(Simakurthy et al., 2024)

EOFB's	Extra Ocular Foreign Bodies
IOFB's	Intra Ocular Foreign Bodies
JRRH	Jinja Regional Referral Hospital
NPL	No Light Perception.
OCO	Ophthalmic Clinical Officer
OFB	Ocular Foreign Body
WHO	World Health Organization

Conclusions

According to the study, ocular foreign body occurrence is a common incidence in Jinja Regional Referral Hospital.

Recommendations

The study recommends that there should be use of protective gear for the people involved in activities where foreign bodies may traumatize their eyes.

The study recommends that health education on OFBs should be given to the risk communities to create awareness by the District Health Education Committee.

The study recommends that there should be training of more health workers by the Government to professionally manage ocular foreign bodies.

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Finally, I would like to express my gratitude to all the researchers whose work I have referenced in this report. Their contributions to the field have been very instrumental in shaping my understanding of the topic.

LIST OF ABBREVIATIONS AND ACRONYMS

DCO	Diploma in Clinical Ophthalmology
DHECT	District Health Education Committee Team

Source of funding

The author declares no source of funding.

Conflict of interest

The author declares no conflict of interest.

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Page | 11

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