

## Overview of Common Eye Diseases among University Student of Rajshahi city, Bangladesh

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**Received:** April 18, 2019; **Published:** May 13, 2019

### Abstract

**Background:** Eye condition has emerged as potential threats to the status of sight in many low and middle income and industrialized country population. The common eye condition is red eye, Blurred vision, Trachoma, Diabetic Retinopathy, Glaucoma and Cataract etc. In Bangladesh Red eye, Cataract and Blurred vision are major eye condition to look at due to lack of proper education and awareness.

**Aim:** The current study aimed to evaluate the prevalence awareness, and knowledge of common eye diseases among the general population of Rajshahi city in Bangladesh.

**Methods:** A self-designed questionnaire was developed in English and used to interview people in different areas of Rajshahi city. The questionnaire collected information regarding demographics, educational, and socioeconomic status of participants, awareness, and knowledge of common eye disease etc.

**Results:** Our of total 1000 student population male respondents were 53% and female 47%, among 88% student know common eye disease and 12% are not know common eye disease. During the study, the majority of participants had knew definition red eye 61%, blurred vision 81%, trachoma 40%, glaucoma 71%, diabetic retinopathy 62%, and vision loss 74%. Although, major portion of participants were knowledgeable regarding definition of red eye, blurred vision, and trachoma as well but in an average basis higher percentage of respondents did not know that such eye condition could lead to vision loss and be prevented. Most of the participants (13%) replied that they are take part in any eye care campaign.

**Keywords:** Eye Disease; Red Eye; Blurred Vision; Cataract; Glaucoma; Diabetic Retinopathy

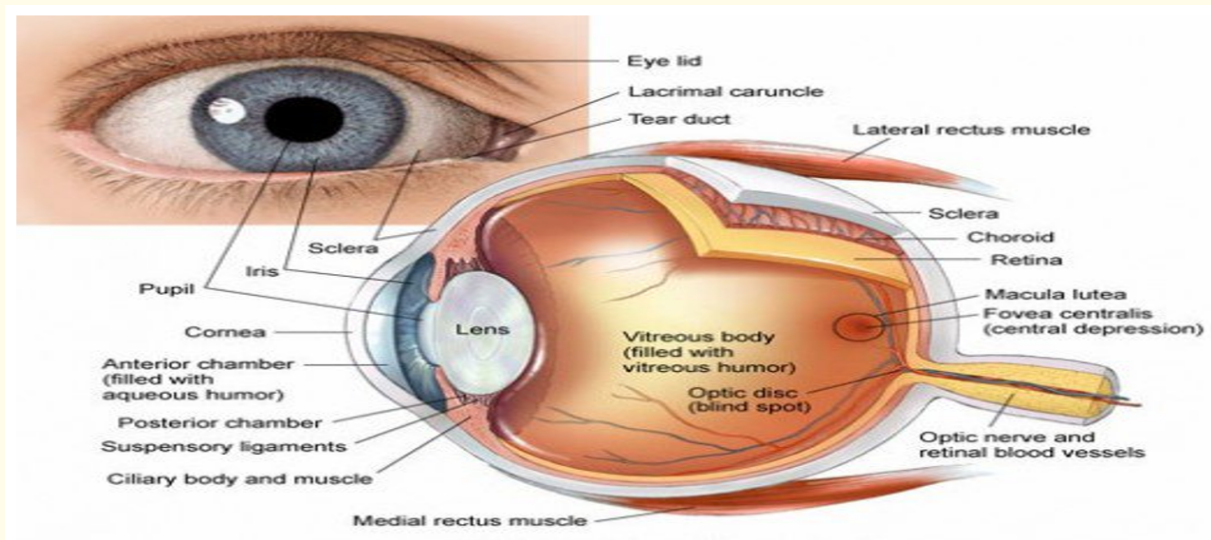
### Introduction

#### Human eye

The human eye is an organ which reacts to light and pressure. As a sense organ, the mammalian eye allows vision. Human eyes help to provide a three dimensional, moving image, normally colored in daylight. Rod and cone cells in the retina allow conscious light perception and vision including color differentiation and the perception of depth. The human eye can differentiate between about 10 million colors [1] and is possibly capable of detecting a single photon [2]. Similar to the eyes of other mammals, the human eye's non-image forming photosensitive ganglion cells in the retina receive light signals which affect adjustment of the size of the pupil, regulation and suppression of the hormone melatonin and entrainment of the body clock.

### Anatomy, parts and structure

- The eye is the photo-receptor organ.
- Size and shape: Human eye is spherical about 2.5 cm in diameter.
- Location: it is situated on an orbit of skull and is supplied by optic nerve.
- There are 6 sets of muscles attached to outer surface of eye ball which helps to rotate it in different direction.
- Four sets of these muscles are straight muscles; superior, inferior, medial and lateral rectal muscle and two sets are oblique muscles; superior and inferior oblique muscles.
- Structurally two eyes are separated but some of their activities are coordinated so that they functions as a pair.



**Figure 1:** Anatomy of the human eye.

### Anatomical structure of Eye

Eye ball consists of three layers

1. Outer fibrous layer: Sclera, cornea and conjunctiva.
2. Middle vascular layer: ciliary body, choroid and iris.
3. Inner layer: Retina.

#### Outer fibrous layer

- Sclera
- Cornea
- Conjunctiva

#### Middle vascular layer

- Choroid
- Ciliary body
- Iris

### Inner layer

- Retina
- Rod cell
- Cone cell



Figure 2

### Eye diseases

Many diseases affect our eyes without any symptoms or warnings. These diseases can be detected and managed by your eye doctor before they damage your anatomy. Thus, it is essential to have your eyes checked regularly. Your optometrist uncovers the following issues most often:

- Conjunctivitis
- Dry Eye Disease
- Glaucoma
- Age-Related Macular Degeneration
- Cataracts
- Red Eye
- Blurred Vision
- Trachoma
- Diabetic Retinopathy

### Symptoms

- Redness
- Irritation (burn, grit, itch)
- Watering

- Blurry vision
- Light sensitivity
- Eye fatigue
- Cloudy or dim vision
- Poor night vision
- Sensitivity to light or glare
- Frequent eyeglass prescription changes

**Risk factor**

- Allergies
- Thyroid eye conditions
- Eye surgery
- Diabetes
- Vitamin A deficiency
- High eye pressure
- Thin cornea
- Diabetes
- Eye surgery or injury
- High blood pressure

**Literature Review**

Author	Year	Topic	Reference
Joseph Tauber, <i>et al.</i>	2018	Tauber Eye Center, discusses the complexity of dry eye disease (DED) and potential causes. Whilst there are several treatment strategies available for DED there is still an unmet need for patient satisfaction	[3]
Jay Pepose, <i>et al.</i>	2018	The aim of the study was to determine if tear osmolarity might be a leading indicator of patient response to lifitegrast, and whether this could be used to advise patients on continuing treatment options. Most patients showed a response within 2 weeks.	[4]
Islam FMA, <i>et al.</i>	2015	It observed that in rural area of Bangladesh awareness of cataract, trachoma, and pterygium was good but limited in relation to the potentially blinding conditions of glaucoma, DR, and AMD. The Results show a large gap between public awareness and treatment practices about common eye diseases.	[5]
Haddad MF, <i>et al.</i>	2017	Haddad reported that awareness campaigns should be made to target unaware population in a survey conducted in Jordan. Familiarity and knowledge about ocular diseases is essential as it would increase the chance of the subject being tested and thus diagnosed early enough if any problem occurred.	[6]
Habiba U, <i>et al.</i>	2016	Investigated in a survey conducted in Pakistan that there was significant gap among primary school teacher’s knowledge and practices related to student’s eye health. Innovative strategies are needed to improve how teachers address student’s eye health issues in the classroom.	[7]
Alemu DS, <i>et al.</i>	2017	Result show that educational status, eye examination at least once in life are related with better awareness and knowledge regarding exemption of common eye diseases. The study conducted in Ethiopia has indicated higher level awareness and knowledge about glaucoma in urban communities than their previous studies.	[8]
Shrestha MK, <i>et al.</i>	2014	This can be show that low awareness of common ocular conditions in associated with factors as female gender, old age, lower levels of education and rural habitation that was surveyed in Nepal. That would be successful health promotion programs should specifically target health determinants to promote health literacy and to ensure timely utilization of eye care service.	[9]
Fatima K, <i>et al.</i>	2015	Fatima reported that the most common eye problem was conjunctivitis a survey conducted in Karachi Pakistan. Nasolacrimal duct blockage presented the second most common cause of pediatric ophthalmic disorder. males were more affected than females.	[10]
Rosman M, <i>et al.</i>	2012	It provides a summary of the prevalence of common eye diseases among the Singaporean adult male population and provides data useful for public health education and disease prevention.	[11]
Scott AW, <i>et al.</i>	2016	Scott investigation that many Americans were unaware of important eye diseases and their behavioral or familial risk factors. Nearly two thirds of respondents were aware of cataracts (65.8%) or glaucoma (63.4%) only half aware of macular degeneration, 37.3% were aware of diabetic retinopathy and 25% were not aware of any condition in their survey study.	[12]

Burn H., <i>et al.</i>	2017	This reported that podoconiosis, trichomatous trichiasis (both NTDs) and cataract are common cause of morbidity among subsistence farmers in the highland of northern Ethiopia. Further research into environmental and biological reasons for this co-morbidity is required. A shared approach to managing these two NTDs within the same population could be beneficial.	[13]
Bodunde OT, <i>et al.</i>	2016	Report show that the perception and attitude of senior secondary school students in sagamu to red eye is poor. Appropriate eye health education and promotional services, including periodic eye examination of students, should be carried out in school health services. Early presentation to eye care centers for its treatment should be encouraged.	[14]
Katibeh M., <i>et al.</i>	1994	Eye diseases is occur below 15 years age, refractive error, vernal conjunctivitis, associated with malnutrition and those referable to injuries were leading causes of eye problems amongst children.	[15]
Ormsby GM, <i>et al.</i>	2003	This study was carried out to determine the pattern of eye disease presenting to the general outpatient clinic and compare it with those in the ophthalmic clinic.	[16]
Murthy GVS, <i>et al.</i>	2008	This reported that document the results of endoscopic orbital decompression performed in a group of patients with thyroid eye disease in order to improve cosmeses.	[17]
Pokharel GP, <i>et al.</i>	2007	This result show that abnormal angiogenesis and wound healing, often in response to tissue ischemia or inflammation. Disruption of the highly ordered tissue architecture in the eye caused by vascular leakage, hemorrhage.	[18]
Chew Y, <i>et al.</i>	2010	This reported show that the outcomes of orbital surgical decompression in patients affected by thyroid orbitopathy with mild to severe proptosis. The surgical procedure included fat removal alone or combines with orbital bone walls fracture.	[19]
Dineen, <i>et al.</i>	2002	There are an estimated 650000 blind adults aged 30 and over in Bangladesh, the large majority of whom are suffering from operable cataract. This survey indicates the need for the development and implementation of national plan for the delivery of effective eye care services, aimed principally at resolving the large cataract backlog and the inordinate burden of refractive error.	[20]
Dandona, <i>et al.</i>	2001	There is a need for health education in Indian population to increase their level of awareness and knowledge of common eye disease. Such awareness and knowledge could lead to better understanding and acceptance of the importance of routine eye examinations for the early detection and treatment of eye diseases, thereby reducing visual impairment in this population.	[21]
Rutzen AR, <i>et al.</i>	2008	The prevalence of blindness and low vision in Cambodia is relatively high compared to other developing countries. Most of the causes of blindness and low vision are treatable or presentable.	[22]

## Materials and Methods

### Study design

This study was planned to show the Prevalence, knowledge and awareness regarding common Eye diseases among University students of Rajshahi city, Bangladesh. We consulted with our professor and made the decision. We made the questionnaire and visited the students for data. We visited at the University of Rajshahi, Varendra University and Rajshahi College. We asked them some questions related to the Eye diseases and preserved the data for further processing.

**Study area**

We have collected data from Rajshahi city for collecting the data for over three month’s period from April to May 2018. Data were collected from University of Rajshahi, Varendra University and Rajshahi College. The purpose of this study was to find out Prevalence, knowledge and awareness regarding common Eye diseases among University students of Rajshahi city, Bangladesh.

**Study population**

The study population was Bangladeshi patient with Eye problem. We were choosing purposive sampling as a tool of data collection this study. We have selected 1000 students as sample of study by using purposive sampling and data was collected. Purposive sampling is a non-random sampling technique. The purposive sampling can use on survey based research. In this types of sampling, sample know about the purpose of study and provide information about question from their knowledge. Purposive sampling was more appropriate than random sampling. Data was collect by direct interviewing method.

**Statistical analysis**

Descriptive statistics, graphical representation and various charts like column, pie, line and bar were applied to the collected data by using Microsoft Excel 2007 software.

**Data collection instrument**

**Questionnaire:** A self-developed questionnaire used for collecting data from participant. In questionnaire include demographic questionnaire such as age, sex, university type, group, family history, economic condition, knowledge on Eye disease, other disease etc.

- Paper
- Pen and pencil
- Information sheet

**Data collection format**

The following format was used to collect the data all the questions were translated in Bengali while asking to the participants for their easy understanding.

**“Prevalence, knowledge and awareness regarding common Eye diseases among University students of Rajshahi city”**

1. Name: \_\_\_\_\_ 2. Age: \_\_\_\_\_ 3. Sex:  Male  Female

4. University type:  Public  Private 5. Group:  Science  Others

6. Family History:  Yes  No

7. Economic condition:  Poor  Middle  Rich

8. Have you knowledge on common Eye disease?  Yes  No

Disease	Do you know definition?	Do you know it may cause vision loss?	Do you know, it can be prevented?
Red Eye	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Blurred vision	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Cataract	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trachoma	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Glaucoma	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Diabetic Retinopathy	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
Vision loss	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

9. Have you suffer from any Eye disease? :  Yes  No  
 If yes: Red Eye / Blurred vision / Cataract / Trachoma / Glaucoma/ Diabetic Retinopathy/ Vision loss

10. Other disease?  Yes  No. If yes: \_\_\_\_\_; \_\_\_\_\_;

11. What you do for current Eye problem? Nothing / Home remedy / Go to Eye care providers

12. Have you checked your Eye?  Yes  No.  
 If yes how often – once in a year / 2-3 in a year / When problem faced

13. By whom you checked your Eyes? Ophthalmologist/ MBBS Doctors/Quacks/ Self assessment

14. Do you use spectacles?  Yes  No.

15. Why? Clear vision / Eye protection / Reading / Cover Eye defects / Fashion

16. Have you knowledge about Eye care service?  Yes  No

17. Which you prefer most? Hospital / Chamber / Clinic / Optical shop

18. Source of information:  Internet  Mass media  Family/Relatives  Physicians  Books

19. Knowledge about treatment:  Yes  No. If yes:  Medicine  Surgery

20. Awareness of risk factor (sunlight, smoking, obesity) of Eye disease.  Yes  No

21. Have you take part in any Eye care campaign?  Yes  No

Signature (Participant): \_\_\_\_\_ Signature (Data Collector): \_\_\_\_\_

Figure 3

## Results

### Age range

In this survey study that the range both male and female student was 17-26 years old. A total of 1000 participants were interviewed with asking the question individually.

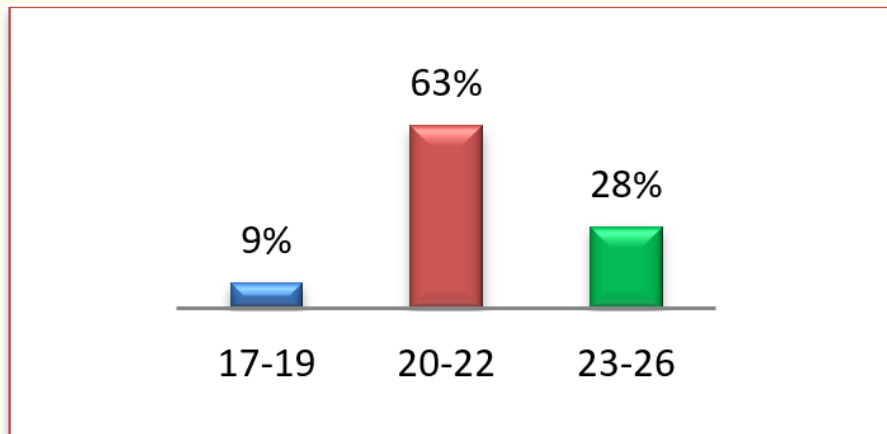


Figure 4: Age distribution.

### Gender

In this survey include total number of sample was 1000; among them 53% are participants male and 47% female.

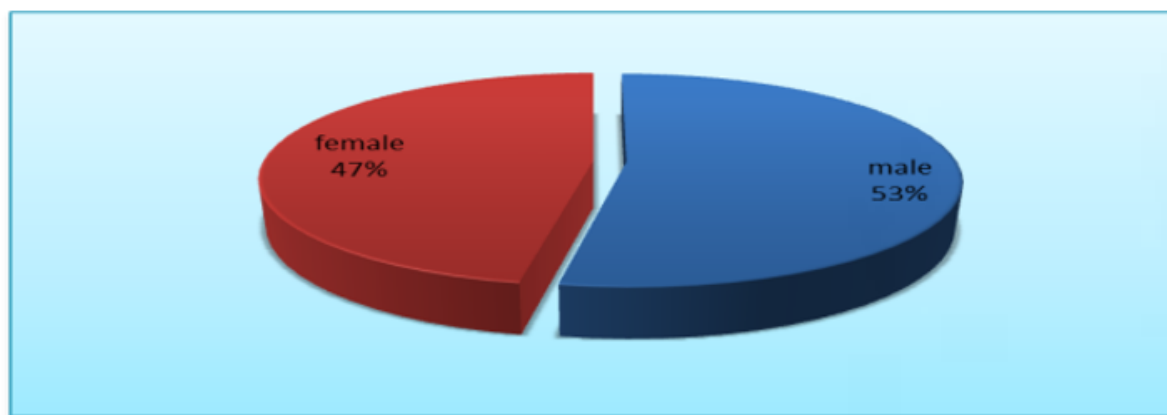


Figure 5: Percentage of gender among the sample participants.

### Family history

In this survey include total number of sample 1000, among them participants are 53% student s family have eye problem and 47% students family have not eye problem.

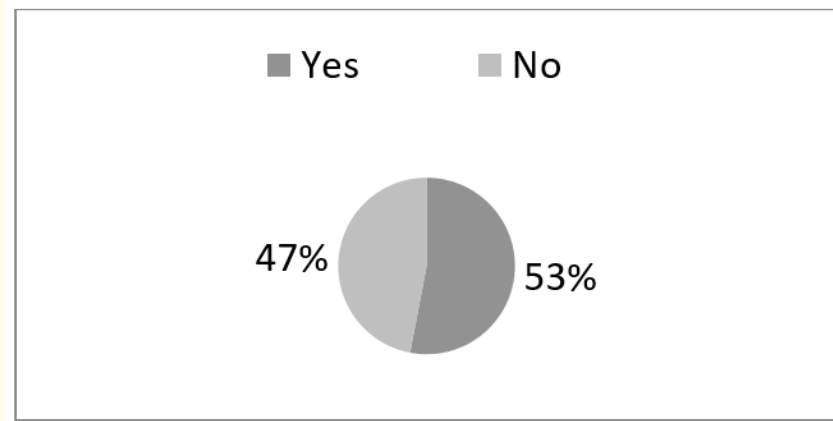


Figure 6: Percentage of family eye problem among the sample participants.

### Knowledge of common eye disease

In this survey include total number of sample 1000, among them participants are 88% students are knowing common eye disease 12% students are not common eye disease.

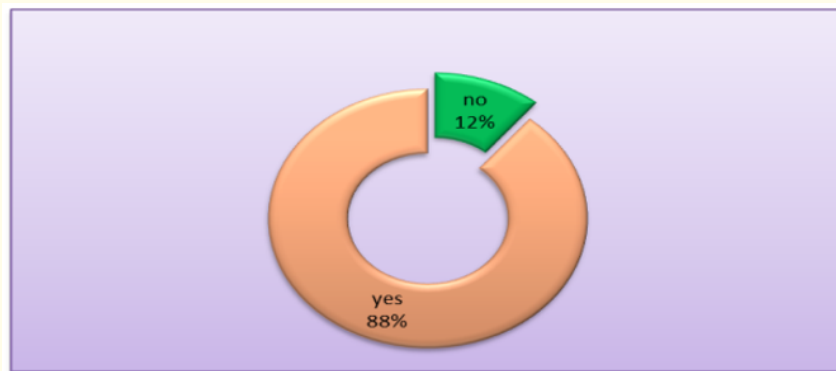


Figure 7: Percentage of knowledge among the sample participants.

### Knowledge about red eye

During the study, 61% answered that have heard about red eye and the remaining 39% said they didn't heard red eye. 36% student knows cause vision loss and 64% students do not know cause vision loss. And others 48% students know can be prevented and 52% students are not know can be prevented among the sample participants.



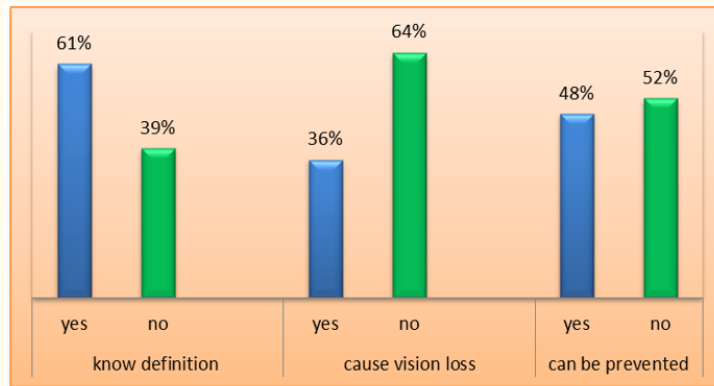


Figure 8: Percentage of knowledge red eye among the sample participants.

### Trachoma

During the study, 40% answered that have heard about trachoma and the remaining 60% said they didn't heard trachoma. 55% student knows cause vision loss and 45% students do not know cause vision loss. And others 36% students know can be prevented and 64% students are not know can be prevented among the sample participants.

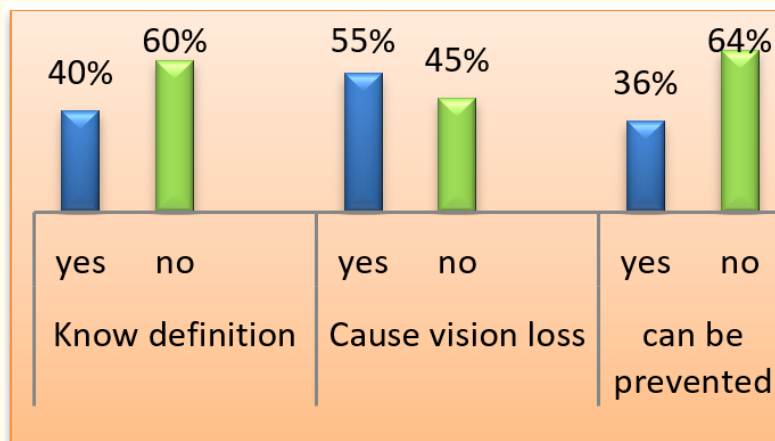


Figure 9: Percentage of knowledge trachoma among the sample participants.

### Glaucoma

During the study, 71% answered that have heard about glaucoma and the remaining 29% said they didn't heard glaucoma. 41% student knows cause vision loss and 59% students do not know cause vision loss. And others 60% students know can be prevented and 40% students are not know can be prevented among the sample participants.

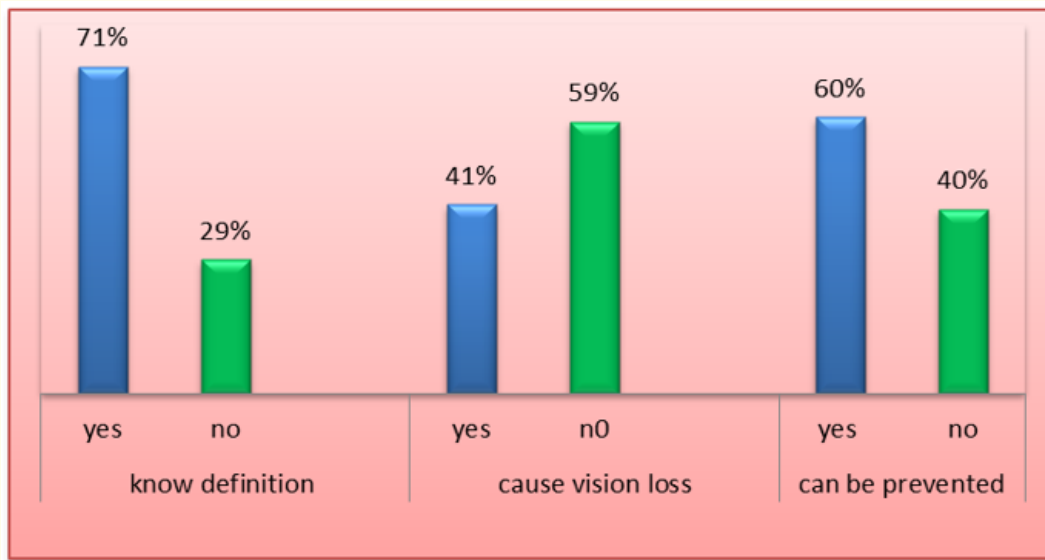


Figure 10: Percentage of knowledge glaucoma among the sample participants.

**Suffer from any eye disease**

In this survey include total number of sample 100, among them participants is 47 % students Suffer from any eye disease and 53% students are not Suffer from any eye disease.

**If yes**

In this survey include total number of sample 100, among them participants is 47 % students Suffer from any eye disease. these are vision loss 9%, red eye/blurred vision loss 2%, blurred vision 34%, cataract 15%, glaucoma 4%, and red eye 36% of the 47% student.

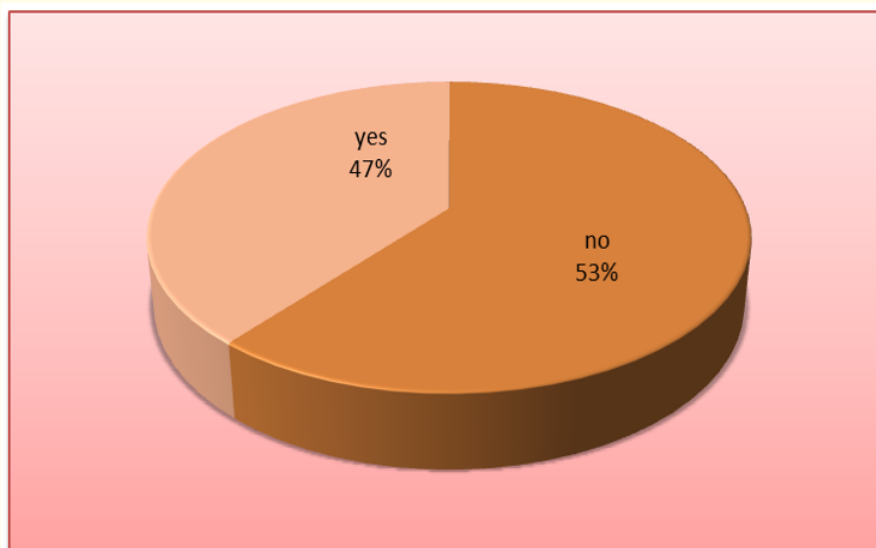


Figure 11: Percentage of Suffer from any eye disease among the students.

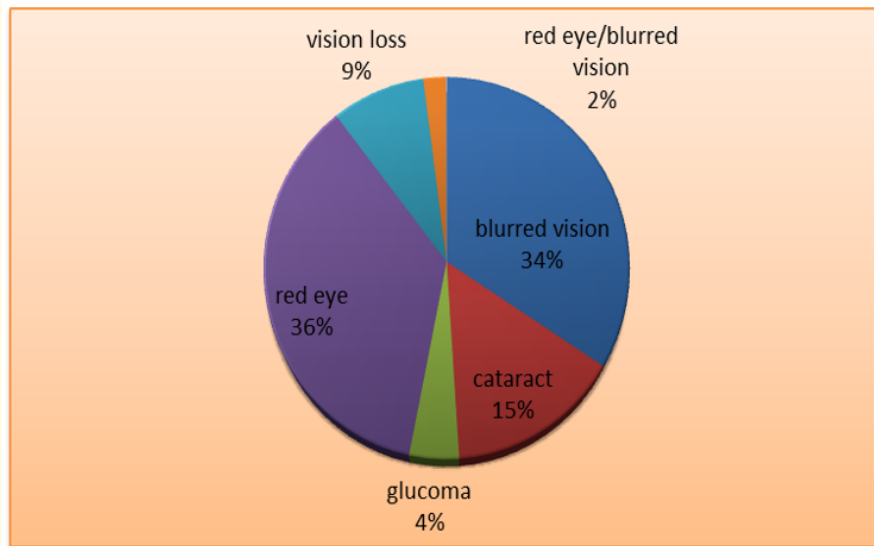


Figure 12: Percentage of Suffer from any eye disease among the sample participants.

**Current eye problem**

Participants are 33% go to care provider, 12% home remedy current eye problem and 55% no eye problem.

**Checked eye**

57% students is checked eye and 43% students are not checked eye.

**If yes**

In this survey include total number of sample 1000, among them participants is 57% student s are checked eye. These are when problem faced 70%, once in a year 22%, and 2 - 3 in a year 8% among the 57% are checked eye.

**By whom checked your eye**

50% student are checked eye by MBBS doctor, 41% ophthalmologist and 9% self-assessment.

**Use spectacles**

Use spectacles and 47% student are not use spectacles.

**Why**

Among them participants are 13% student use spectacles. Because of 77% student faced clear vision, 2% student used for cover eye defects,7% student used for eye protection, fashion and reading of the 43% sample students.

**Awareness of risk factor**

In this survey include total number of sample 1000, among them participants is 61% students are aware of risk factor and 39% students are not know awareness of risk factor.

### Take part in any eye care campaign

13% students are Take part in any eye care campaign and 87% students are not Take part in any eye care campaign.

Among them participants is 43 % student

### Discussion

The study was conducted over the student of 1000 from different student of Rajshahi city. Among that 53% respondents were male and 47% of them female. The sample aged below 26 years was maximum portion and most of them (87%) belonged to middle class family. The prevalence of eye diseases was calculated at 88% in the 100 people that were examined in the course of this survey. The prevalence of red eye 61%, blurred vision 81%, Trachoma 40%, Glaucoma 71%, Diabetic retinopathy 62%, vision loss 74% respectively. The findings revealed that female 47% were worst sufferer than male 53% participants. Many reports showed that blindness prevalence was found to be greater with increased age. Blindness was also found to be more prevalent among women, illiterate subjects, and in economically disadvantaged people. In our study, a participant having heard of disease in question and aware to eye care service was defines as awareness and having understanding of the eye disease was defined knowledge. During the study it was observed that 61% of the responded that they were known about definition of red eye whereas this amount was 81% blurred vision, 40% trachoma, 71% glaucoma, 62% diabetic retinopathy, 74% vision loss. The knowledge about vision loss and disease can be preventable were also reasonable for the mentioned diseases except trachoma disease where only 61%% respondents knew that it may cause vision loss. While observing glaucoma, it was found that there was proportion of participants who knew about definition (71%), vision loss (74%) knowledge of glaucoma. These findings also support the report of a study conducted in Bangladesh. In this study 13% of participants replied that they went for eye examination whenever they had a complaint but noted is their study that majority of the samples who reported an ocular problem did not went for eye checkup. They also observed that 1.6% of subjects went for eye examination yearly but in the present study 57% of individual went for yearly eye examination which was comparatively very high. Similar to the study conducted in Indian and Bangladesh, education level and economic status also have a significant association with the awareness of eye diseases. Individuals who were graduate and those belonging to upper economic class were much aware about the various eye diseases and exhibited positive attitudes and practices towards eye care, this may be attributed to the factor better knowledge and accessibility to medical and diagnostic care. In our findings we observed that ophthalmologist (41%) in a chamber was the first preference to eye checkup.

### Conclusion

Based on all the facts, it can be concluded that knowledge and awareness about Cataract, Glaucoma, Red Eye, Trachoma, Glaucoma, Blurred Vision and Diabetic Retinopathy are not at good state at all. Even in the young generation, the knowledge is lacking and not up to the level as it is supposed to be. However due to the minimal exposure in the education system, they don't get as much information as they were supposed to be. Consequently, they will suffer from different complications. At this point, the only way to remedy is to promote health awareness programs and much other awareness related things. It is however need to mention that this research was conducted on randomly chosen general people from Rajshahi city and in a very small scale so it doesn't reflect the whole idea. Therefore, it is suggested that if a conclusive result about the awareness of eye diseases is desired, further large scale researches should be conducted.

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**Volume 10 Issue 6 June 2019**

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