

Daffodil International University



“Prevalence, Knowledge and Awareness Regarding Eye Diseases among The Undergraduate Students at a Private University of Dhaka city, Bangladesh”

[This report is submitted in total fulfillment of the requirements for the subject “Project Work and Presentation” and partial fulfillment of the requirements for the degree of Master of Pharmacy]

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Approval

This Project, “**Prevalence, Knowledge and Awareness regarding Eye Diseases among the Undergraduate Students at a Private University of Dhaka city, Bangladesh**” Submitted by ID: 0242310011093009 to the Department of Pharmacy, Daffodil International University, has been received as gratification for the partial fulfillment of the requirements for the degree of Master of Pharmacy and approved as to its mode and quantity.

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Declaration

I hereby declare that this project report entitled “**Prevalence, Knowledge and Awareness regarding Eye Diseases among the Undergraduate Students at a Private University of Dhaka city, Bangladesh**” is done by me under the supervision of Mr. MD. Mizanur Rahman, Assistant Professor, Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University. I am declaring that this project work is my original work and have not been submitted elsewhere for any other academic achievement.

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Layla Sultana Sharna
Author



Dedication

Dedicated to My Parents

&

My Mentor

Who always support me and the one who brings out the best in me.

Abstract

Background

Eye disease especially Blurred vision, Red eye and Trachoma are global concern as well as an increasing and highlighted problem in Bangladesh. Although some studies on eye disease have been conducted in Bangladesh with a little range or on a specific eye disease, our aim to determine prevalence, knowledge and awareness regarding eye diseases among the undergraduate students at a private university of Dhaka city, Bangladesh.

Method and Materials

A cross-sectional health survey was conducted using a self-designed standard questionnaire which was developed in English. Total 100 students participates from various departments of the university. The students were randomly selected and requested to fill up the questionnaire.

Result

The participants ranged in age from 18 to 29 years. The number of male participants (66%) was greater than that of female participants (34%). Most students (86%) came from middle-class families. The results showed that most participants were knowledgeable about the definitions of red eye, blurred vision, cataract, and vision loss, while knowledge about diabetic retinopathy, glaucoma, and trachoma was comparatively low. Participants with eye diseases also reported having other conditions such as tumors, anemia, asthma, and peptic ulcers. Regarding their current eye problems, about 55% of the students were not taking any action, while 40% were consulting eye care providers. Most eye patients (76.8%) were having their eyes checked by ophthalmologists, typically when they faced problems. A significant portion of the participants (69.2%) used spectacles for clear vision. The results suggest that participants were aware of eye care services, with hospitals being their preferred place for such services. Most participants obtained their information from family members. Additionally, 76% of the participants were aware of risk factors for eye disease, such as sunlight, smoking, and obesity. However, 90% of the participants had not taken part in any eye health campaigns.

Conclusion

Our survey revealed that the younger generation lacks sufficient knowledge and awareness regarding prevalent eye illnesses. Their comprehension is not as thorough as it ought to be. The government must design successful eye care campaigns and support health awareness programs in order to address this problem. These programs are essential to lowering visual impairment in Bangladesh's general populace as well as among students in Dhaka.

Keywords

Prevalence, Knowledge, Awareness, Eye Disease, Red Eye, Blurred Vision, Trachoma, Cataract, Glaucoma, Diabetic Retinopathy, Vision Loss, among students, Dhaka.

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Chapter One

Introduction

Introduction

1.1 General Introduction

The eye is the human organ of seeing. It is a vital organ for vision and plays a major role in human existence and anatomy. The human eye is capable of providing more information about the outside world than all other senses put together. The organ that gives us the ability to see is the eye. The eye interprets light that things reflect or emit, enabling us to see and comprehend their shapes, hues, and sizes. The eye can see in both bright and dim light, but it cannot see anything at all in total darkness.

Almost all activities that involve the use of the eyes require them, including reading, watching television, and many more. Taking good care of your eyesight is crucial. Just try to read the newspaper or notice whether a car is coming. It would be difficult to cross the street or go food shopping without the assistance of others, which can be highly inconvenient. I think most people would agree that the sense that is treasured the most over the others is sight. [1]

As such, ocular diseases have the potential to seriously and diversely impact human living. Consequently, it is crucial to be cognizant of one's own visual acuity in order to identify changes over time and seek ophthalmological treatment if needed, in addition to being aware of the common eye disorders. Surgical treatments for the eye can often resolve the issues listed below, most of which call for consultation with an ophthalmologist. [2]

1.2 Anatomy, parts and structure of Eye

- The organ that processes light in the eye.
- The diameter of a spherical human eye is approximately 2.5 cm.
- It is fed by the optic nerve and located on an orbit of the skull.
- The eyeball can be rotated in six distinct directions because to six sets of muscles linked to its outer surface.
- These muscles are divided into two oblique sets, superior and inferior oblique muscles, and four straight sets, superior, inferior, medial, and lateral rectal muscles.
- Even though two eyes are structurally different, they work together because of some coordinated movements.

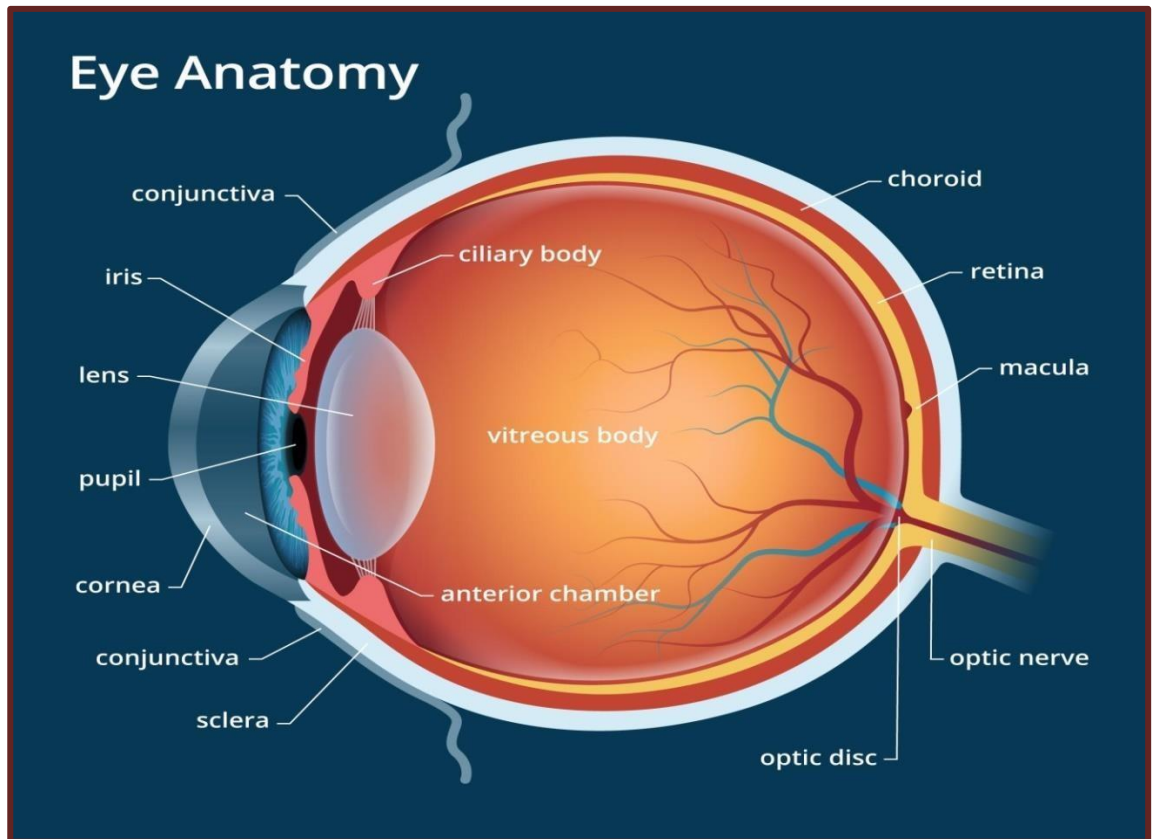


Figure 1.1: Anatomical structure of Eye

There are three layers in an eye ball.

- External fibrous layer: Cornea, conjunctiva, and sclera
- Middle vascular layer: Iris, choroid, and ciliary body
- Interior layer: Retina

❖ External fibrous layer:

The components are as follows-

❖ Sclera:

- The thick membrane of strong fibrous connective tissue makes up its outermost supporting layer.
- It covers five or six portions of the eyeball.
- It keeps the eye's form and serves as an attachment point for the extrinsic muscle.

❖ Cornea:

- It is the sclera's thin, translucent front portion.
- It creates a little protrusion at the front and covers a 1/6 portion of the sclera in front.
- As an avascular plant, cornea takes in oxygen from the atmosphere.
- To focus on the retina, it refracts light.

❖ Conjunctiva:

- The cornea is covered with a thin, translucent covering.
- It is composed of one stratified layer of squamous epithelium.
- It is formed of single layer of stratified squamous epithelium
- It offers corneal protection.

❖ Middle vascular layer:

The components are as follows-

❖ Choroid:

- It is a layer of thick pigmented and vascular tissue located beneath the sclera.
- Light is not reflected because it is absorbed by the pigmented cells.
- The purpose of a choroid is to prevent light reflection and to supply nourishment.

❖ Ciliary body:

- These are attached to choroid and present at the junction of sclera and cornea.
- These are located at the sclera-cornea interface and are linked to the choroid.
- It comprises two sets of suspensory ligament and ciliary muscle.
- The ciliary body is fixed to the lens, ensuring its proper alignment.
- Its purpose is to alter the lens's shape by contracting or relaxing the muscles.

❖ Iris:

- The diaphragm is an opaque, muscular, pigmented structure that hangs in front of the lens of the eye.
- It has two different kinds of muscles: radial and circular. The pupil's size is determined by the action of these muscles.
- The iris' pigment provides color to the eye.
- By regulating the size of the pupil, the iris regulates the amount of light that enters the eye.

❖ Interior layer:

It is made up of photosensitive components and photoreceptor cells.

❖ Retina:

- The innermost layer is called the retina.
- There are 7 million cone cells and 125 million rod cells in each eye ball.
- Only cone cells are found in the Fovea centralis, a small depression in the retinal wall.
- The blind spot is where the optic nerve enters the retina. Rods and cone cells are absent from it. It is the least light-sensitive and produces no image when light hits a blind spot.

❖ Rod cell:

- Rods are sensors that detect color changes from black to white.
- Almost rod vision is what night vision is.
- It works well in low light.
- Composed of vitamin A, rhodopsin is a photosensitive pigment found in it.

❖ Cone cell:

- The cones serve as sensors for color perception.
- It can distinguish between colors and work in bright light.
- Has the pigment iodopsin, which is photosensitive.

❖ Eye lens and chambers:

- It is a sizable, pliable, transparent, biconvex, and fibrous crystalline structure that is located behind the iris.
- A clear elastic capsule encloses the lens.
- The thickness and accommodation power of lenses are regulated by ciliary muscles.
- It shapes the object's picture on the retina.

The eyeball is divided into two chambers by a lens.

a. Aqueous chamber

b. Vitreous chamber

❖ Aqueous chamber:

- It is a smaller fluid filled chamber between cornea and lens.
- Between the cornea and lens is a tiny chamber filled with fluid.
- It contains breathing gasses, glucose, ascorbic acid, hyaluronic acid, amino acids, and aqueous humour.
- Aqueous humor nourishes the cornea and lens while refracting light rays so that the retina is focused.

❖ Vitreous chamber:

- It is a larger fluid filled chamber between lens and retina.
- This is a bigger space between the lens and retina that is filled with fluid.
- It is packed with salts and mucoprotein-rich gelatinous vitreous humor.
- It focuses light on the retina by supporting it and refracting it. [3]

1.3 Eye Diseases

Globally, eye illnesses are quite prevalent and have an impact on people's quality of life at all age ranges. The prevalence of eye disorders differs not just between nations but even within a single country's regions. The reasons for the variations in eye disorders that lead to visual issues among different age groups could include environmental, climatic, racial, social, and literacy variables. While congenital and infectious issues are more common in youngsters, adults with diabetes, hypertension, and age-related cataracts account for the majority of visual difficulties. [4]

50 years of age and beyond account for about 81% of all cases of blindness or moderate to severe visual impairment. As the elderly population grows, more people will be susceptible to long-term eye conditions that could compromise their eyesight. An estimated 19 million kids suffer from visual impairments. Twelve million of these kids suffer from refractive error-related visual impairment. Approximately 1.4 million people suffer from incurable blindness, necessitating access to vision rehabilitation therapies in order to maximize functioning and minimize handicap. [5]

Worldwide, there are over 253 million people who have visual impairment; 36 million of these are blind. Most people live in low-income environments. Eighty percent or older is the average age. Worldwide, the two most common causes of vision impairment are untreated cataracts and uncorrected refractive errors. Over 80% of cases of vision impairment are preventable or curable. [6]

1.4 Red Eye

Eyes that seem red on the surface are known as red eye, and it is a relatively common ailment. The surface of the eye has a number of tiny blood vessels that can become visible and inflamed when under certain conditions. These conditions include exhaustion, illness, allergies, infections, and injuries to the eye.

Healthy Eye



Red Eye



Figure 1.2: Comparison between Healthy Eye and Red Eye.

- Exposure of the surface of the eye to increased blood vessel size results in red eyes.
- Broken blood artery on the sclera, also known as subconjunctival hemorrhage
- Edema, or inflammation of the eyelids
- Stye, which is a red pimple on the eyelid
- Contact lenses with special effects to produce a "crazy" red-eye look
- A red eye in a picture
- The degree of red eye varies; it might seem as a bright red covering the entire sclera or as a few swollen blood vessels that appear as pink or red wavy lines across the "white" of the eye. Common causes of red eyes include allergies, ocular fatigue, excessive contact lens wear, and common infections like pink eye (conjunctivitis). On the other hand, uveitis or glaucoma are two more serious eye diseases that redness in the eyes might occasionally indicate. Please always get in touch with your eye doctor for an accurate diagnosis and treatment if your red eye becomes worse or stays. [7]

1.4.1 Causes of Red Eye

- **Environmental Pollution:** Pollen, dust, wind, dry air, and other environmental allergens and irritants are among the most prevalent causes of red eyes.
- **Insufficient Sleep:** Red eyes are another symptom of insufficient sleep.
- **Eye infections:** In addition to producing red eyes, eye infections and inflammations can also cause discomfort, discharge, itching, and blurred vision.
- **Unclean contact lens:** Redness in the eyes can result from improper contact lens care or usage.
- **Sign of a disease:** Red eyes may be a sign of a more serious issue, such as acute glaucoma, blepharitis, conjunctivitis, scleritis, or corneal ulcers. Make an appointment with your primary care physician or eye care specialist as soon as possible if you are suffering any other symptoms, such as discharge or pain connected to the redness, to rule out any underlying issues. [8]

1.4.2 Symptoms of Red Eye

Depending on the aforementioned reasons, red eyes may also include other symptoms like:

- Burning feeling
- Eyes that are wet
- Eye itching
- Itchy eyelids
- Swollen lid of the eye
- Discharge: may be watery or thick.
- An unfamiliar body sensation
- The sensitivity to light, or photophobia
- The skin of the eyelids may become crusty or scaled due to dermatitis.
- Losing eyelashes. Usually, this is connected to blepharitis. [9]

1.4.3 Treatment for Red eye

To ensure that your red eyes and discomfort don't worsen, it's a good idea to take some preventative precautions.

- Refrain from rubbing or touching your eyes.
- If the surroundings are causing you discomfort, try to relocate or spend as little time there as possible.
- Alternatively, you might try applying an ice pack to your eyes to reduce pain and swelling as well as possible redness.
- You may also think about running some cool water over your eyes. Your eyes won't be harmed by this method of cleaning and irrigation.

- A balanced diet and adequate sleep contribute to the health and infection resistance of your eyes and other vital organs.

Make an appointment with your doctor if you think that the reason behind your chronic red eyes could be something more serious. In order to treat your symptoms, your doctor will evaluate you and prescribe medication based on the diagnosis. [10]

1.5 Blurred vision

The lack of keen vision that causes objects to appear fuzzy and out of focus is known as blurry vision.

Nearsightedness, farsightedness, and astigmatism, often known as presbyopia, are the main refractive abnormalities that lead to blurred vision. However, impaired vision can also be a sign of more serious issues, such as a neurological ailment or an eye disease that could eventually cause blindness.

Healthy eye



Blurry vision eye



Figure 1.3: Comparison between Healthy and Blurry Eye.

While one eye may only occasionally have hazy vision, both eyes may occasionally have it. It is common to confuse cloudy vision, which makes objects appear "milky," with hazy vision. The majority of the time, foggy vision is a sign of a particular illness, such as cataracts, but it can also indicate a major eye issue.

Healthy Vision



Blurred Vision



Figure 1.4: Comparison between Healthy and Blurred Vision.

1.5.1 Causes and Treatment of Blurred Vision

- **Myopia:** Myopia (nearsightedness) can cause headaches, squinting, eye strain, and blurry vision in one or both eyes. Far-off things appear blurry due to myopia, the most prevalent refractive defect. Correcting nearsightedness is most commonly accomplished with glasses, contact lenses, and refractive surgery like LASIK and PRK.
- **Hyperopia:** When you can see objects clearly in the distance but find it difficult to focus on objects up close, or if it causes unusual eye strain and tiredness, you have blurred vision due to hyperopia (farsightedness). Even faraway objects can appear blurry in cases of extreme farsightedness. Similar to myopia, hyperopia can be managed with refractive eye surgery, contact lenses, or glasses.
- **Astigmatism:** When you can see objects clearly in the distance but find it difficult to focus on objects up close, or if it causes unusual eye strain and tiredness, you have blurred vision due to hyperopia (farsightedness). Even faraway objects can appear blurry in cases of extreme farsightedness. Similar to myopia, hyperopia can be managed with refractive eye surgery, contact lenses, or glasses.
- **Chronic dry eyes:** Your vision may become hazy or fluctuate as a result of dry eye syndrome, among other symptoms. In order to keep the eye lubricated and healthy, more severe cases of dry eyes may require prescription medication or punctal plugs. Artificial

tears, or lubricating eye drops, can help.

- **Pregnancy:** Pregnancy often causes blurry vision, which can occasionally be combined with diplopia, or double vision. Your cornea's thickness and shape can fluctuate due to hormonal fluctuations, which can cloud your eyesight. Pregnant women frequently experience dry eyes, which can impair vision.
- **Ocular migraines or migraine headaches:** The common symptoms before the onset of an ocular migraine or migraine headache are blurred vision, flickering light, halos, or zigzag patterns; these are usually benign and transient.
- **Eye floaters:** Transient patches or floating objects in your range of vision might cause blurriness. The gel-like vitreous in the eye usually liquifies with age, allowing small pieces of tissue to float freely inside the eye and throw shadows on the retina. This is when floaters usually emerge.
- **Eye drops and medication:** Rashes and blurred vision can be brought on by some eye drops, particularly medicated eye drops that contain preservatives. Prescribing artificial tears, punctal plugs, or medication for dry eyes can usually manage these side effects. Additionally, blurred vision and dry eyes are side effects of some drugs, like allergy tablets. Your optometrist or ophthalmologist can advise you on the possibility of blurry vision from any medications during a thorough eye exam.
- **Over-wearing contact lenses:** It is possible for proteins and other debris from your tear film to accumulate on your disposable contact lenses—or any type of contacts—if you wear them longer than your doctor has suggested. You run the risk of getting eye infections and experiencing impaired vision as a result.[11]

1.6 Cataract

A cataract is a clouding of your eye's normally clear lens. It is similar to gazing through a fogged-up or frosty glass for those who have cataracts to see through foggy lenses. It can be more challenging to read, drive (especially at night), or read a friend's expression when you have cataracts. The majority of cataracts progress gradually and don't initially impair vision. However, cataracts will ultimately cause vision problems over time.

Healthy Eye



Eye with Cataract

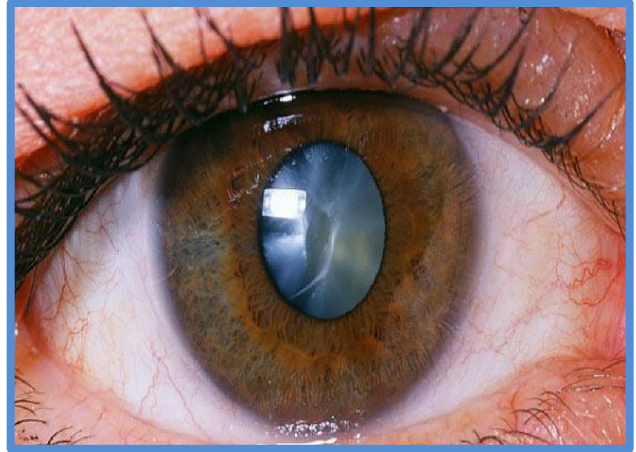


Figure 1.5: Comparison between Healthy Eye and Eye with Cataract

Initially, you can manage cataracts with the use of increased lights and eyewear. However, cataract surgery may be necessary if your reduced vision prevents you from engaging in your regular activities. Thankfully, cataract surgery is typically a safe and successful process.

Healthy Eye Vision



Vision with Cataract



Figure 1.6: Visual Comparison between Healthy Eye Vision and Vision with Cataract

1.6.1 Symptoms of Cataract

Signs and symptoms of cataracts include:

- Dim, fuzzy, or foggy eyesight
- Getting more trouble seeing at night
- Light and radiation sensitivity
- More light is required for reading and other activities.
- Perceiving "halos" surrounding lights
- Regular modifications to the prescription for contact lenses or glasses
- Colors that fade or turn yellow
- A single eye with dual vision

1.6.2 Causes of Cataract

The tissue that makes up your eye's lens ages or is injured, which is how most cataracts form. Cataracts can be more likely to develop in some hereditary illnesses that lead to other health issues. Moreover, diabetes, previous eye surgeries, and other medical disorders can all contribute to cataract development. Cataract development can also result from long-term steroid drug use.

1.6.3 Types of Cataracts

Cataract types include:

- **Cataracts affecting the center of the lens (nuclear cataracts):** Initially, a nuclear cataract may result in increased nearsightedness or momentary improvement in your reading vision. However, with time, the lens progressively becomes more yellow in color, making it harder for you to see.

The lens may even turn brown as the cataract gradually gets worse. It may become difficult to differentiate different color tones when the lens exhibits advanced yellowing or browning.
- **Cataracts that affect the edges of the lens (cortical cataracts):** On the outside margin of the lens cortex, white, wedge-shaped opacities or streaks are the first signs of a cortical cataract. The streaks gradually reach the center of the lens, obstructing light flow through its center.

- **Cataracts that affect the back of the lens (posterior subcapsular cataracts):** Usually developing in the rear of the lens, directly in the direction of light, a posterior subcapsular cataract begins as a tiny, opaque patch. A posterior subcapsular cataract frequently produces glare or halos around lights at night, impairs vision in strong light, and interferes with reading vision. Compared to other forms of cataracts, these ones typically proceed more quickly.
- **Cataracts you're born with (congenital cataracts):** Cataracts can develop in childhood or be present from birth in certain individuals. These cataracts could be inherited, related to an intrauterine infection or trauma, or both.

Other possible causes of these cataracts include rubella, neurofibromatosis type 2, galactosemia, myotonic dystrophy, and galactosemia. Though they don't always impair vision, congenital cataracts are typically removed very quickly after they are discovered.

1.6.4 Risk factors of Cataract

Factors that increase your risk of cataracts include:

- Increasing age
- Diabetes
- Overexposure to sunlight
- Puffing
- Fatness
- Excessive blood pressure
- Any prior inflammation or injuries to the eyes
- Previous eye surgery
- Extended usage of drugs containing corticosteroids
- Overindulging in alcohol consumption

1.6.5 Prevention of Cataract

Research has not demonstrated a way to stop cataract development or to mitigate its advancement. Physicians, however, believe that a number of tactics could be beneficial, such as:

- **Have regular eye examinations:** Early detection of cataracts and other eye issues can be achieved with the aid of eye exams. How often should you get your eyes examined? Find out from your doctor.

- **Quit smoking:** Consult your physician for advice on quitting smoking. To assist you, there are several tactics, medications, and counseling available.
- **Manage other health problems:** In the event that you have diabetes or other illnesses that raise your risk of cataracts, adhere to your treatment plan.
- **Choose a healthy diet that includes plenty of fruits and vegetables:** You may be sure that you're getting plenty of vitamins and nutrients by including a range of vibrant fruits and vegetables in your diet. Antioxidants, which are abundant in fruits and vegetables, support eye health.

Antioxidants taken as pills have not been shown in studies to prevent cataracts. However, a recent large population study found a link between a low risk of cataract development with a nutritious diet high in vitamins and minerals. Fruits and vegetables are a healthy method to up your intake of vitamins and minerals and have numerous well-established health advantages.
- **Wear sunglasses:** Cataracts may develop as a result of ultraviolet radiation from the sun. When you are outdoors, wear sunglasses that prevent ultraviolet B (UVB) radiation.
- **Reduce alcohol use:** The risk of cataracts can be raised by excessive alcohol consumption. [12]

1.7 Trachoma

Eye infections caused by bacteria are known as trachoma. It is transmissible when it comes into touch with an infected person's eyes, eyelids, nose, or throat secretions. Handling contaminated objects, including handkerchiefs, can potentially spread the infection.

Healthy Eye



Eye with Trachoma



Figure 1.7: Comparison between Healthy Eye and Eye with Trachoma.

Initial eye and eyelid irritation and itching may be a symptom of trachoma. then could observe pus coming out of the eyes and puffy eyelids. Loss of vision may result from untreated trachoma. The primary avoidable cause of blindness in the world is trachoma. [13]

1.7.1 Causes of Trachoma

A bacteria called Chlamydia trachomatis, which can also cause chlamydia, a sexually transmitted infection, is the source of certain subtypes of trachoma. Infected individuals can transmit Trachoma to others by coming into touch with secretions from their eyes or noses. Routes of transmission include hands, clothes, towels, and insects. Flies that seek out victims are another vector of infection in impoverished nations.

1.7.2 Signs and symptoms of Trachoma

Signs and symptoms of trachoma usually affect both eyes and may include:

- Mild itching and irritation of the eyes and eyelids
- Minimal eyelid and ocular discomfort and itching
- Mucus- or pus-filled discharge from the eyes
- Swelling of the eyes
- Light sensitivity, often known as photophobia
- Pain in the eyes [14]

1.7.3 Risk factors of Trachoma

Factors that increase risk of contracting trachoma include:

- **Poverty:** In undeveloped nations, Trachoma mainly affects the poorest populations.
- **Crowded living conditions:** Infection propagation is more likely amongst closely spaced residents.
- **Poor sanitation:** The disease is propagated in part by unhygienic environments and poor personal hygiene, such as dirty hands or faces.
- **Age:** The disease primarily affects youngsters between the ages of 4 and 6 in places where it is prevalent.
- **Sex:** The condition is two to six times more common in women than in men in some places.

- **Flies:** Infection risk may be higher in residents of places where fly populations are difficult to manage.
- **Lack of latrines:** There is a higher prevalence of the illness among populations lacking access to functional latrines, a kind of public restroom. [15]

1.8 Glaucoma

A build-up of fluid in the eye causes pressure, which in turn harms the optic nerve and results in glaucoma. Damage to the optic nerve, which is in charge of sending information from the eyes to the brain, can result in significant vision loss or, in the worst case scenario, blindness. Glaucoma is the medical name for an increase in intraocular pressure, which typically ranges from 12 to 20 mm Hg. [16]

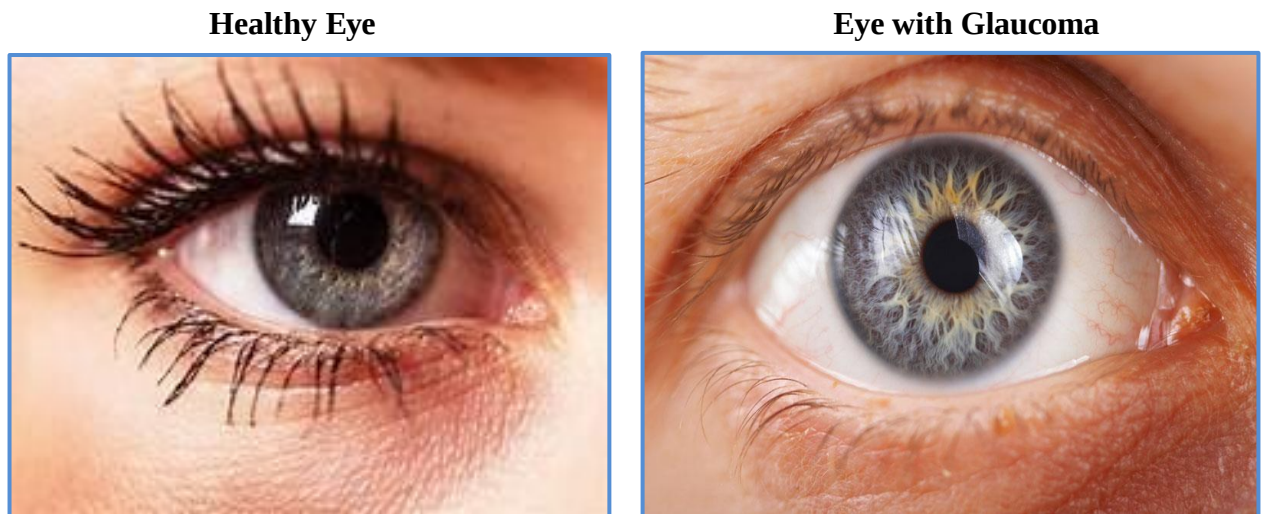


Figure 1.8: Comparison between Healthy Eye and Eye with Glaucoma.

1.8.1 Causes of Glaucoma

Glaucoma is mainly occurs due to:

- An excessive amount of aqueous humor production
- The globe's ability to expel aqueous fluid is compromised.

1.8.2 Symptoms of Glaucoma

Patients are unable to diagnose glaucoma until substantial (and irreparable) damage has been done since the condition frequently develops without symptoms. Ocular hypertension, a disorder characterized by elevated eye pressure that may indicate a higher risk of glaucoma, and therefore something that should be regularly tested for by an eye doctor. Acute closed angle glaucoma manifests as abrupt, severe symptoms such as:

- Seeing hazy
- Excruciating pain in the eyes
- Headache
- Rainbow haloes
- Nausea and vomiting

1.8.3 Treatment of Glaucoma

Prescription eye drops work by reducing the amount of fluid produced in the eye or by facilitating better drainage from the eye. Individual outcomes could differ. The optic nerve is under less pressure after glaucoma surgery because the eye's fluid flow is improved. Depending on the kind of glaucoma a patient has, the doctor may use a highly focused laser beam to either change the patient's current drainage path or make a new hole in their iris. Although glaucoma can be treated surgically, damage already done to the eyes cannot be undone, therefore routine eye exams are crucial to preventing damage from occurring in the first place. [17]

1.9 Diabetic Retinopathy

One ocular consequence of diabetes is diabetic retinopathy. It results from injury to the blood arteries that supply the retina, the light-sensitive tissue located at the back of the eye. Diabetic retinopathy may initially only produce little vision issues or no symptoms at all. It may finally result in blindness. Anybody with type 1 or type 2 diabetes has the potential to acquire the illness. Your risk of developing this eye problem increases with the length of your diabetes and the degree of blood sugar control you maintain.

1.9.1 Symptoms of Diabetic Retinopathy

Early on in diabetic retinopathy, you might not have any symptoms. Diabetic retinopathy symptoms can include the following as the condition worsens:

- Dark strands or spots that appear in your vision
- Seeing hazy

- Variations in eyesight
- Diminished eyesight in color
- Visibility defects, such as dark or vacant regions
- Diminished vision

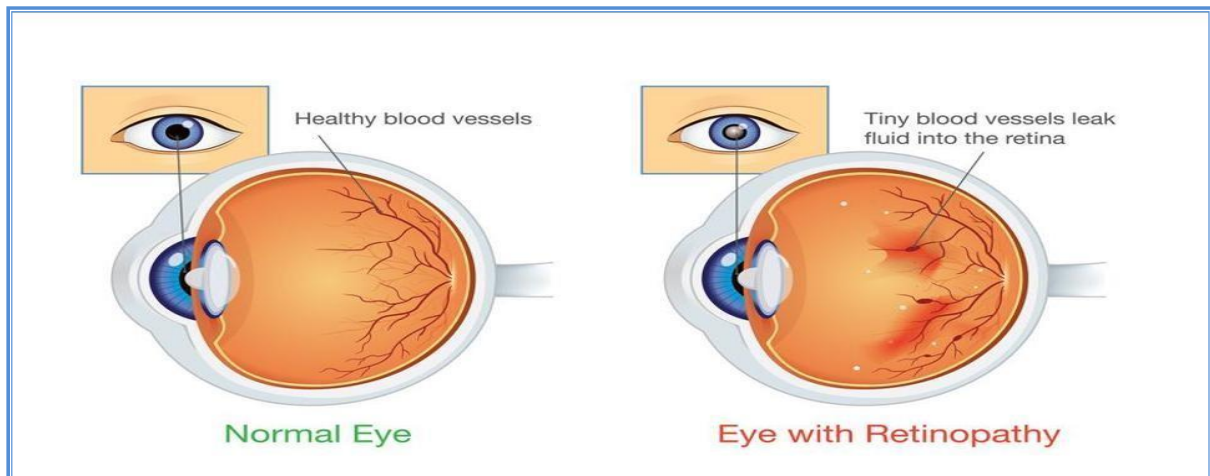


Figure 1.9: Comparison between Normal Eye and Eye with Retinopathy

1.9.2 Causes of Diabetic Retinopathy

There are two types of diabetic retinopathy:

- **Early diabetic retinopathy:** Non proliferative diabetic retinopathy (NPDR), the more prevalent kind, is characterized by the absence of new blood vessel growth. The retinal blood vessel walls deteriorate when you have non-proliferative diabetic eye disease (NPDR). Sometimes fluid and blood seep into the retina from tiny bulges called micro aneurysms that protrude from the vessel walls of the smaller vessels. Larger retinal vessels may also start to enlarge and change in diameter. As more blood vessels become clogged, NPDR can worsen from mild to severe. There may be swelling of the retinal nerve fibers. Macular edema, a disorder that has to be treated, can occasionally cause swelling in the macular region of the retina.
- **Advanced diabetic retinopathy:** This more severe form of diabetic retinopathy, called proliferative diabetic retinopathy, can develop from diabetic retinopathy. Damaged blood vessels in this kind burst, resulting in the formation of new, aberrant blood vessels in the retina and the potential for leakage into the vitreous, a translucent, jelly-like fluid that fills the center of the eye. The retina in the back of your eye may eventually separate from the lens due to scar tissue that is triggered by the development of new blood vessels. Pressure may accumulate within the eyeball if the newly formed blood vessels obstruct the regular drainage

of fluid from the eye. Glaucoma may arise from damage to the optic nerve, which is responsible for transmitting images from your eye to your brain.

➤ **Risk factors of Diabetic Retinopathy**

Diabetic retinopathy can strike anyone with diabetes. The following factors may make you more likely to develop the eye condition:

- **Duration of diabetes:** The likelihood of having diabetic retinopathy increases with the length of time you have diabetes.
- Inadequate regulation of your blood glucose level
- Excessive blood pressure
- Excessive cholesterol
- Pregnancy
- Usage of tobacco
- Being Native American, Black, or Hispanic

1.9.3 Prevention of Diabetic Retinopathy

It is not always possible to avoid diabetic retinopathy. On the other hand, serious vision loss can be avoided with routine eye exams, strict blood pressure and sugar management, and early intervention for visual issues.

Take the following actions to lower your chance of developing diabetic retinopathy if you have diabetes:

- **Control your diabetes:** Include regular exercise and a nutritious diet in your everyday routine. Aim for at least 150 minutes a week of moderate-to-intense aerobic exercise, like walking. As recommended, use insulin or oral diabetic medicines.
- **Check and record your blood sugar:** If you're sick or under stress, you might need to take your blood sugar readings more frequently. You should check and record your blood sugar level multiple times a day. Find out from your doctor how frequently blood sugar testing is necessary.
- **Consult your physician about a test for glycosylated hemoglobin:** The hemoglobin A1C test, also known as the glycosylated hemoglobin test, measures your average blood sugar level over the two to three months leading up to the test. A1C should ideally be less than 7% for the majority of persons.

- **Maintain appropriate blood pressure and cholesterol levels:** Losing extra weight, eating well, and exercising frequently can all be beneficial. Medication is also required occasionally.
- **Ask your doctor for assistance in quitting if you smoke or use other tobacco products:** Diabetes-related problems, such as diabetic retinopathy, are more likely to occur among smokers.
- **Observe any changes in your vision:** If you notice abrupt changes in your vision or if it gets cloudy, unclear, or spotty, call your eye doctor immediately. [18]

1.10 Vision Loss

The inability to see anything, even light, is known as vision loss or blindness. People who are partially blind can see just a limited distance. He might not be able to tell the difference between objects' shapes or have fuzzy vision, for instance. When someone is completely blind, they are completely dark and unable to see anything.

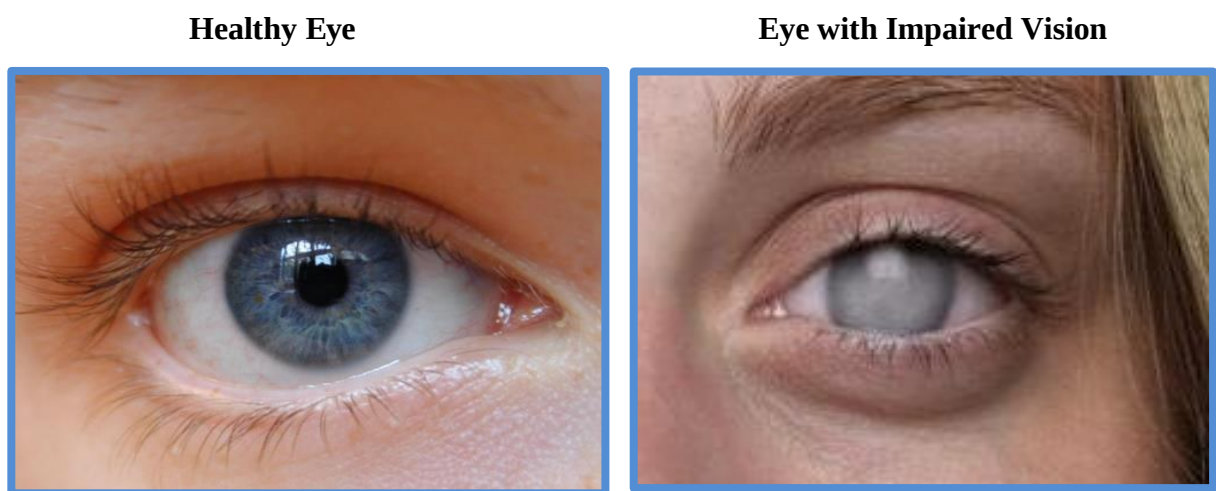


Figure 1.10: Comparison between Healthy Eye and Eye with Impaired Vision.

A substantially compromised vision is referred to as legal blindness. A legally blind person can only see what someone with normal eyesight can see from 20 feet away. If someone loses their vision unexpectedly, they should get medical help straight soon. Treating blindness right away may improve the prognosis for visual restoration, depending on the reason. Both surgery and medicine may be used as treatments.



Figure 1.11: Visual Comparison between Healthy Eye and Profound Vision Loss.

1.10.1 Symptoms of Vision Loss

A person who is completely blind is unable to see anything. He may exhibit some or all of the following signs of partial blindness:

- Unclear vision
- A loss of shape perception
- Observing merely shadows
- Inadequate vision at night
- Tunnel vision

1.10.2 Causes of Vision Loss

The following eye diseases and conditions can cause vision loss:

- The term "glaucoma" describes four distinct eye diseases that can harm the optic nerve, which travels from the eyes to the brain to transmit visual data.
- The portion of the eye responsible for fine details vision is destroyed by macular degeneration. Usually, older persons are impacted.
- Cloudy eyesight is caused by cataracts. They affect older persons more frequently.
- It can be challenging to notice details with a lazy eye. It might cause visual loss.
- Inflammation known as optic neuritis may result in either temporary or permanent vision loss.
- Blindness can also result from tumors affecting the optic nerve or retina.

A potential consequence for someone with diabetes or a stroke is vision loss. Blindness can also result from birth defects, eye traumas, and difficulties following eye surgery. [19]

1.10.3 Treatment of Vision Loss

Several of the following may aid in the restoration of vision in specific types of visual impairment:

- eyeglasses
- contact lenses
- surgery
- medication

A doctor will offer advice on adjusting to decreased vision if a patient suffers from partial blindness that cannot be treated. He can, for instance, utilize an audio book and clock, enlarge the text on his computer, and read with a magnifying glass. [20]

1.11 Aim of study

The incidence of blindness in underdeveloped nations like Bangladesh exacerbates the socioeconomic load already placed on us. Three disorders related to the eyes have been highlighted as potential dangers to the eyesight status of populations in many industrialized and low-income countries. They are trachoma, red eye, and blurred vision. Certain eye conditions can be easily cured because they are the only cause of ocular morbidities, but others will always result in blindness if they are not properly treated or prevented in a timely manner. Consequently, it is critical to ascertain the prevalence, knowledge, and awareness of eye disorders among undergraduate students at a private university in Dhaka, Bangladesh, as well as to ascertain the pattern of eye diseases.



Chapter Two

Literature Review

Literature Review

01. Nasiru M et al. (2011); showed that, Nasiru M et al. (2011); showed that, In Sokoto State, blindness is very common, however the primary reasons are mainly preventable. Reducing obstacles can be accomplished by providing integrated, sustainable, economical, and equitable services and by educating people about the eye care program. [21].
02. Jay CE et al. (2005); studied that, Human ocular tissues are accumulating lead and cadmium, especially in the retinal pigment epithelium and choroid. The putative toxicity of certain heavy metals to the eyes and their potential connection to eye disorders. [22]
03. Khatri B et al. (2014); observed that, A child's personality, learning style, and ability to transition to school can all be negatively impacted by various eye disorders that are more common in certain age groups, genders, and occupations. In order to prevent these issues, timely and appropriate eye care is required [23].
04. Zhou JB et al. (2008); reported that, There was an uneven understanding between the patient and possible treatments for cataract condition. Less desire for improved vision and financial difficulties were the main treatment hurdles. Providing patients with affordable, high-quality cataract surgery and education about eye health care is essential [24].
05. Taylor HR et al (2005); showed that, In Australia, the problem of vision loss is far more widespread than is generally acknowledged. Both cataracts and uncorrected refractive errors, which are easily treated, account for 76% of poor vision. In [25].
06. Xu et al. (1999); observed that, the huge community necessary for cataract surgery still remains as a great challenge in China [26].
07. Mehari ZA (2013); showed that, Finding patients who are at danger of becoming blind and giving them the appropriate care depends on screening for eye illnesses. Most of the causes of visual impairments, ocular illness, and blindness were curable or preventable [27].
08. Chipendo GN et al. (2012); showed that, The prevalence of eye diseases was higher in men than in women, but there was no statistically significant correlation between sex and these conditions ($p=0.350$), ruling out sex as a risk factor [28].

09. Rahman MM et al. (2004); found that, While glaucoma only causes a small percentage of blindness in the population, its prevalence is rather high in Bangladesh. Bangladesh's glaucoma population, 40 years of age and above, is thought to number about 586000 [29].
10. Waleed AR et al. (2017); demonstrated that, The knowledge and misunderstandings about different eye disorders and eye care among Saudi people in Riyadh city using such a large sample size, assessing a collection of multiple eye disease related knowledge at once (glaucoma, diabetic retinopathy, strabismus, and cataract) [30].
11. Maberley D et al (2007); reported that, In this underprivileged group, the frequency of visual impairment was startlingly high overall. According to these findings, ocular illness and the availability of refraction and prescription eyewear are two major health issues for residents of the VDES [31].
12. Dandona R et al. (2001); suggested that, To raise the public's level of awareness and understanding of prevalent eye illnesses, health education is required. By raising awareness and educating people about the value of regular eye exams in identifying and treating eye illnesses early on, routine eye exams can help lower the rate of visual impairment in this population [32].
13. Gupta P et al. (2013); investigated that, In Singapore, approximately 10% of Indian people undergo cataract surgery. The frequency of cataract surgery was not significantly impacted by migration or socioeconomic factors. Among Indian immigrants residing in Singapore, diabetic retinopathy was a significant contributor to post-operative visual impairment [33].
14. Rosman M et al. (2012); Based on SiMES-1, the study summarizes the prevalence of common eye illnesses among adult Malay Singaporeans and offers information that may be used for disease prevention and public health education [34].
15. Ubah JN et al. (2006); pointed that, the several reasons why the eyes go red. Patients with red eyes should be able to tell those who are not eye specialists what to do, especially when it comes time to refer them to an eye specialist, by being aware of the causes [35].
16. Muhammad N et al. (2015); pointed that, Active control methods are required since trachoma risk factors are endemic in the research locations. Though the majority of local government areas have a low burden of both the active and blinding disease, the disease's burden is clustered [36].
17. Thapa SS et al. (2011); showed that, There was a severe lack of awareness and information about glaucoma and cataracts in this community. In order to increase awareness of cataract and glaucoma among this population, eye care services should focus on preventing visual impairment due to refractive errors, screening for incurable chronic eye illnesses, and encouraging health education [37].

18. Yau JW et al. (2012); investigated that, there are about 93 million cases of diabetic retinopathy worldwide, along with 17 million cases of proliferative diabetic retinopathy, 21 million cases of diabetic macular edema, and 28 million cases of vision-threatening diabetic retinopathy [38].
19. Neena J et al. (2008); pointed that, As the two main causes of low vision and blindness, cataract and refractive errors should be given priority in control methods. Blindness and low vision burden can be prevented in most cases[39].
20. Bharath B et al. (2017); observed that, India presently has a shortage of cataract surgeons, and the rising number of diabetics presents a significant obstacle to filling this requirement [40].
21. Fatima F et al. (2015); found that, The most prevalent ocular condition was conjunctivitis. Blockage of the nasolacrimal duct was the second most frequent cause of pediatric ocular disorders. More men than women were impacted [41].
22. Puri SK et al. (2016); showed that, Students have limited awareness of cataracts, one of the most common treatable causes of blindness. It is important to raise public knowledge of cataracts and the range of treatment options available for them. Programs for health education should give cataracts more attention [42].
23. Christen WG et al. (1992); reported that, According to a hypothesis, smoking cigarettes raises the chance of developing posterior sub capsular cataract and nuclear sclerosis [43].



Chapter Three

Material and Methods

Materials and Methods

3.1 Study Design

The purpose of the study was to determine the prevalence, awareness, and understanding of ocular illnesses among undergraduate students at a private university in Dhaka, Bangladesh. After discussing our options with our supervisor, we decided. To gather data, we created a questionnaire and paid students a visit. In Dhaka, Bangladesh, we went to the Daffodil International University's Various Department. We collected the data and processed it later by asking students from different departments specific questions on eye problems.

3.2 Study Area

We have gathered data from Daffodil International University for collecting the data for over three month's period from November 2023 to February 2024.

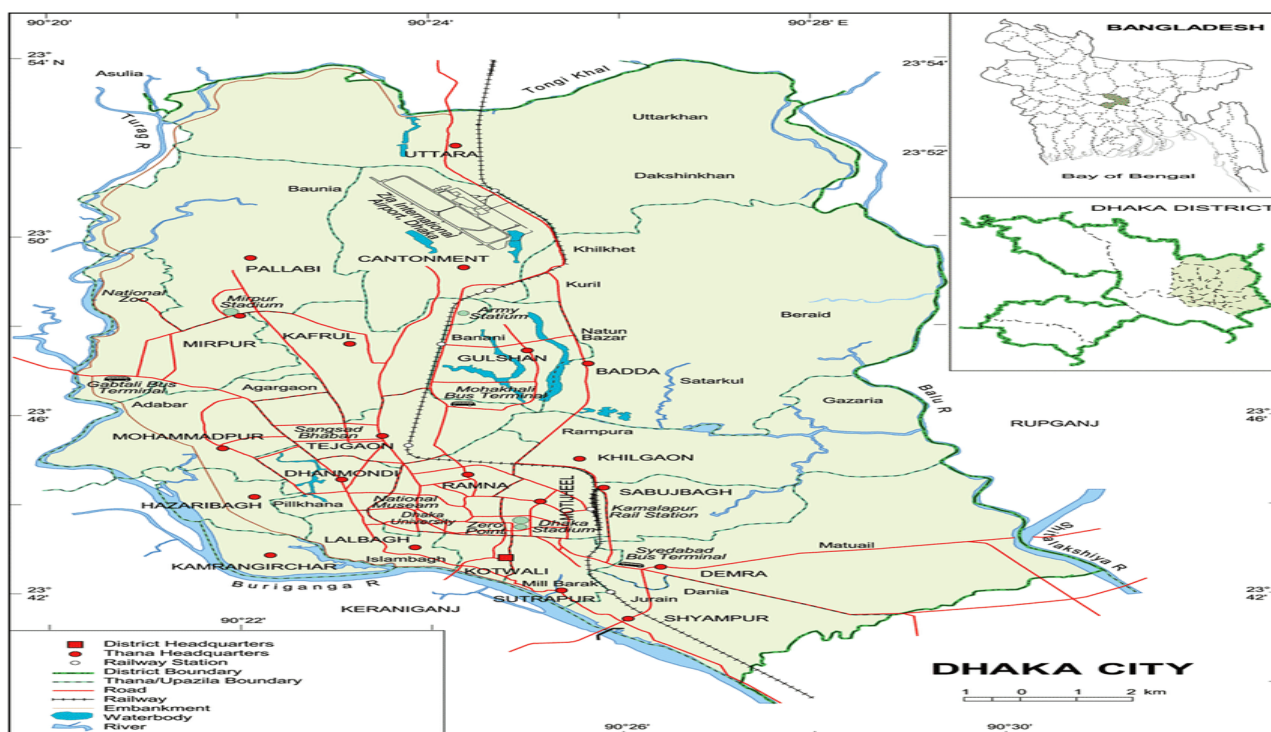


Figure 3.1: Dhaka City Map

3.3 City and Field Description

Bangladesh's densest district is Dhaka District, which is situated in the country's center. It belongs to the Division of Dhaka. The capital of Bangladesh, Dhaka, is situated on the Even though Dhaka (city corporation) only makes up around 25% of the district's total territory, it serves as the political, economic, and cultural hub of both the nation and the district. As an administrative division, Dhaka District does not encompass the entire conurbation, as is the case with many other cities, as there are rural areas inside the district. Rather, it is part of the Greater Dhaka conurbation, which has expanded into neighboring districts. With 1463.6 square kilometers as its entire size, it is 565.1 square miles. It is located on the eastern banks of the Buriganga River, which empties into the district to the south of the Turag. Sixteen upazilas, twenty-one thanas, three municipalities, 77 union parishads, and eighteen hundred villages make up the district. In [45]

3.4 Study Population

Participants in the study were students with eye problems from Dhaka city and Bangladesh. Data for the study was gathered through purposive sampling, with a sample of one hundred students chosen. The technique is one of random sampling. This kind of sampling ensures that the sample is informed on the study's objectives and can answer questions about the topic. Direct interviewing was used to get data.

3.5 Field test of questionnaire

The field test with the participants was completed before the commencement of data collection. A questionnaire for gathering data about circumstances and consequences was developed. This questionnaire was devised by reviewing literature from other countries and considering the Bangladeshi perspective. Participants were informed about the aim and objectives of the study. The field test served as preparation for initiating the final data collection process. It facilitated the development of a plan for carrying out the data collection procedure.

3.6 Data Collection

A self-designed standard questionnaire was used to conduct this cross-sectional health survey, which involved interviewing 100 students in individuals. We gather data for this health survey with assistance from Md. Mizanur Rahman, Assistant Professor, Department of Pharmacy, Daffodil International University, Dhaka. The study tool, a data collection form, comprised 21 questions to which students may answer "yes" or "no," with some of their written responses including a justification. Every thing had to do with eye illness. Students at the university provided the data. We visited the locations and questioned the students there about eye conditions. The data collectors translated the English questionnaire into Bengali for the participants whose mother tongue is that language. The Bengali answers given by the respondents and were translated to the English in the same way by the data collectors.

3.7 Ethical considerations

The general guidelines (section 12) of the WMA Declaration of Helsinki were adhered to when conducting the study. Daffodil International University in Dhaka's pharmacy department provides logistical help for this survey-based study as well. Neither harmful agents nor samples were taken from the human individuals that took part in this study. This survey-based study did not require further institutional ethics committee approval because the human subjects were simply involved in the interview. We promise not to share any personal information about the students with anyone.

3.8 Statistical analysis

Descriptive data by statistics, graphical representation and various charts like Bar diagram, pie charts were applied to represent the data using Microsoft Excel software.

3.9 Data collection instrument

Questionnaire: A self-developed questionnaire used for collecting data from participant. In questionnaire include demographic questionnaire such as age, sex, Community type, Family history, Economic condition, other disease etc.

- Paper
- Pen and pencil
- Information sheet

3.10 Data Collection Format

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

Department of Pharmacy
Daffodil International University



Prevalence, Knowledge and Awareness regarding Eye Diseases among the Undergraduate Students at a Private University of Dhaka city.

1. **Name:** _____ 2. **Age:** _____ 3. **Sex:** ☐ Male ☐ Female
4. **Community Type:** ☐ Urban ☐ Rural 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	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Blurred vision	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Cataract	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Trachoma	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Glaucoma	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Diabetic Retinopathy	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Vision loss	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ 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. ☐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):**

Survey coordinators:

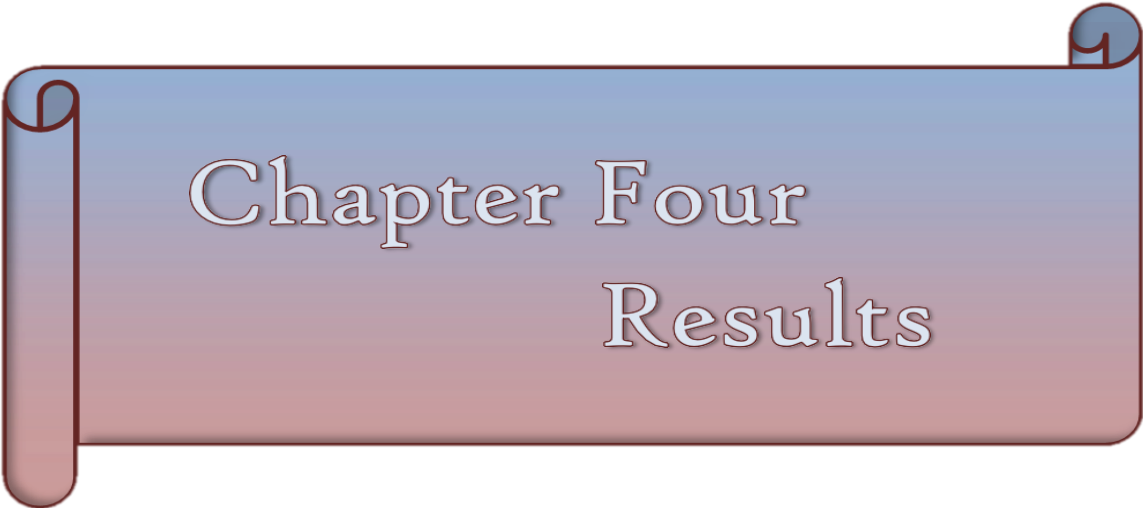
1. Md. Mizanur Rahman, Assistant Professor, Dept. of Pharmacy, Daffodil International University
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3.1 Data collection technique

Initially, we explained to the participants what was on the consent form. From those participants who provided consent, we gathered data. A structured questionnaire was created by looking over the findings of certain literature about falls and stroke in various nations. Subsequently, the questionnaire was examined to the viewpoint of Bangladeshi culture and circumstances. Using a questionnaire, we were able to obtain data regarding student prevalence. In a face-to-face interview, students provided accurate information and asked clarifying questions as necessary. In this study, data was gathered via in-person interviews.

3.2 Data collection procedure

At first we had taken permission from the students of different departments and asked them some questions on the basis of our information sheet. Before collecting data, we provided information sheets. Next, we conducted in-person conversations with the participants to gather data via a questionnaire. We asked questions during this procedure, and individuals either filled out the form or we did. When the interviewee became confused during the interview, the interviewer assisted them by clarifying certain words that had the same meaning.



Chapter Four Results

Results

In this chapter the statistical analysis of our project work is given. The aim of the project work is to identify the circumstances and consequences of students with the common eye diseases and also a comparative evaluation to find out prevalence, knowledge and awareness regarding common eye diseases among the students of Dhaka city, Bangladesh.

4.1 Demographic Classification

4.1.1 Age Distribution

In here, total students 100 and their age are between 18 – 29 years. Among them 16%($n = 16$) student's age are between 18 – 20 years, 53%($n = 53$) are between 19 – 21 years, 30% ($n = 30$) are between 24 – 26 years and the rest 1% is ($n = 1$) between 27-29 years old respectively.

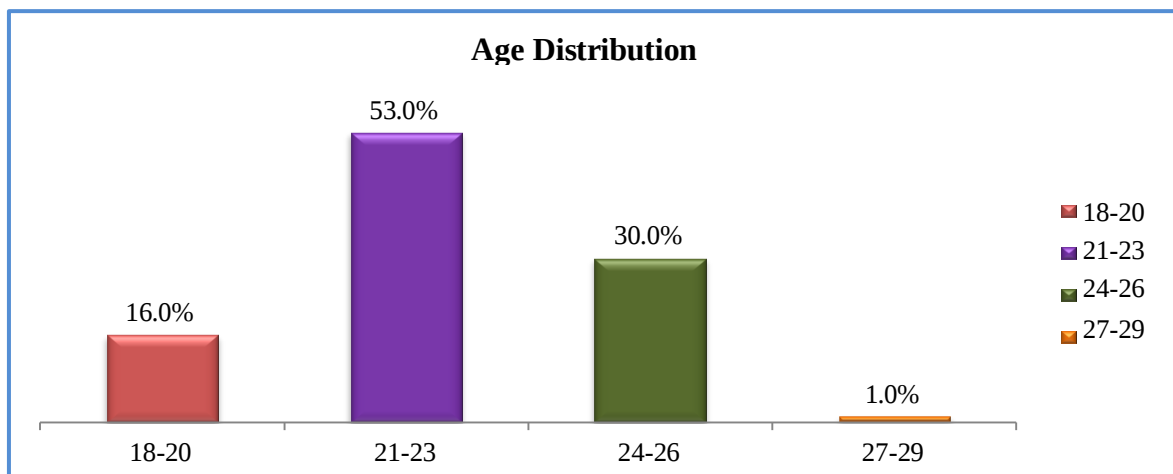


Figure 4.1: Bar diagram of students according to their age in percentage.

4.1.2 Gender Distribution

The survey result shows that most of the students (among 100) were male about 66%($n = 66$). On the other hand female students were 34% ($n = 34$) which is much less than male students.

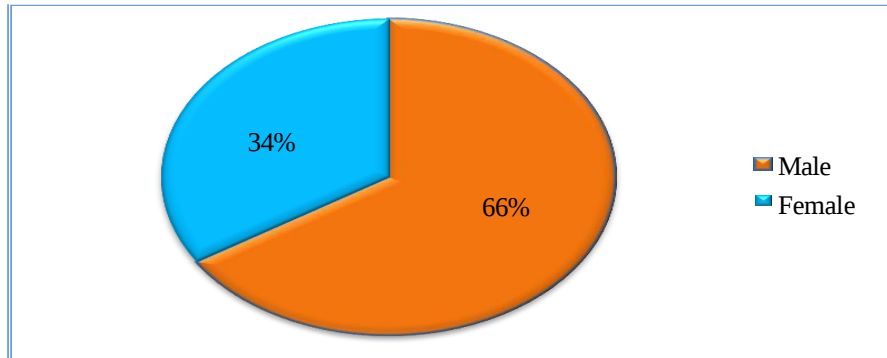


Figure 4.2: Pie chart of Gender distribution of students according to their sex.

4.1.3 Community Type

We observed that, 53%($n = 53$) of the total 100 students were from Urban area and the rest 47%($n = 47$) was from Rural area.

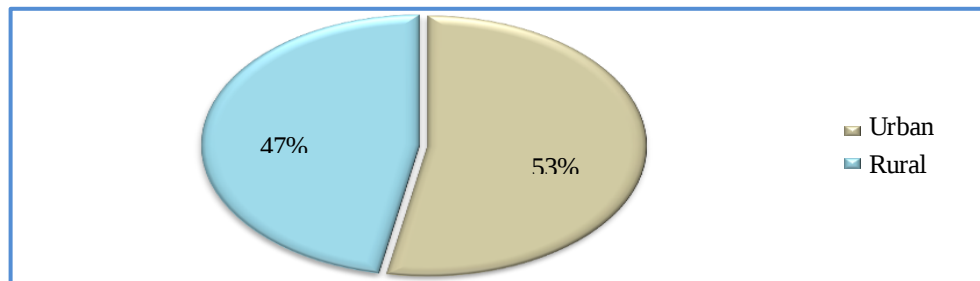


Figure 4.3: Pie chart of students according to their Community type in percentage.

4.1.4 Students Group

We observed that, 48%($n = 48$) of the total 100 students were from science group and the rest 52%($n = 52$) was from others group.

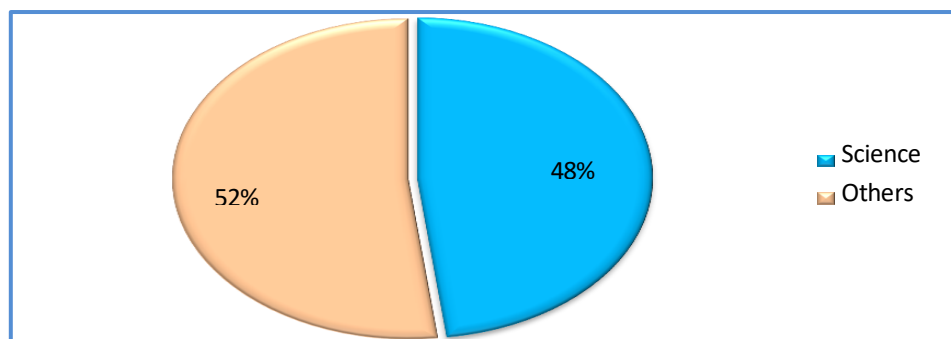


Figure 4.4: Pie chart of students according to their group in percentage.

4.1.5 Family History

We observed that, 69% ($\square = 69$) students have family history of having common eye diseases and 31% ($\square = 31$) has no family history of having common eye diseases.

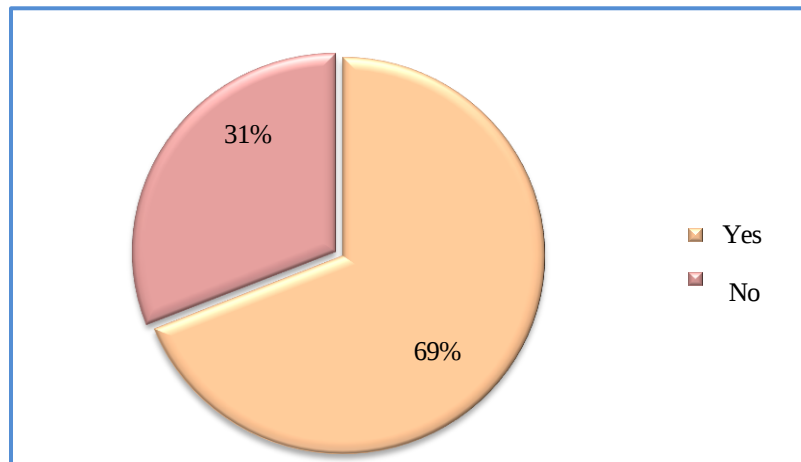


Table 4.5: Pie chart of students according to their family history in percentage.

4.1.6 Economic condition

We observed that out of 100, most of the students come from middle class family and their percentage is 86% ($\square = 86$), poor and rich people were 3% ($\square = 3$) and 11% ($\square = 11$) respectively.

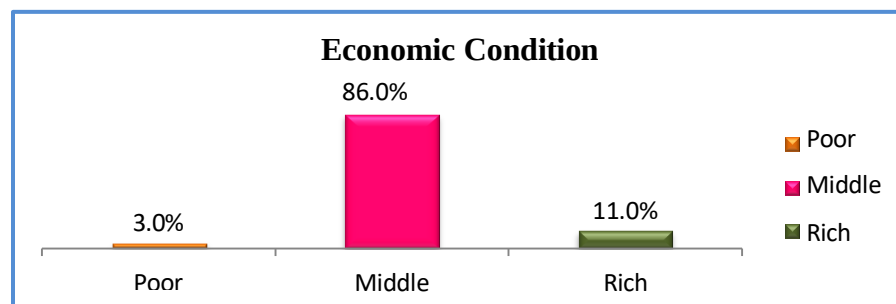


Figure 4.6: Bar diagram of students according to their economic condition in percentage.

4.2 Health Related Condition

4.2.1 Knowledge on eye diseases

We found that most of the students know about common eye disease and their percentage is 95% ($n = 95$) and rest of the students about 5% ($n = 5$) has no knowledge about common eye diseases.

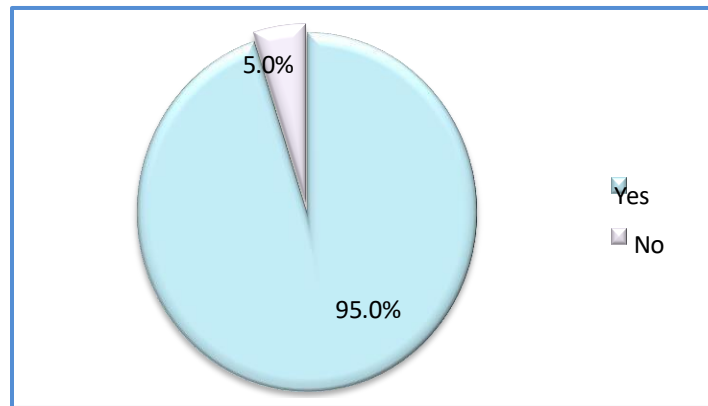


Figure 4.7: Pie chart of students according to their knowledge on eye diseases in percentage.

4.2.2 Knowledge on eye diseases definition

The following Table and Figure shows that about 76% ($n = 72$) among 95 students know the definition of red eye and 24% ($n = 23$) students do not know the definition, 93% ($n = 88$) has knowledge about the definition of blurred vision and about 7% ($n = 7$) students has no knowledge, for cataract 91% ($n = 86$) know the definition and about 9% ($n = 9$) do not know the definition. For Trachoma 51% ($n = 48$) know the definition and 49% ($n = 47$) do not know the definition. In case of glaucoma 42% ($n = 40$) know the definition and 58% ($n = 55$) do not know. About diabetic retinopathy 58% ($n = 55$) know the definition and 42% ($n = 40$) do not know definition. And 91% ($n = 86$) students know the definition of vision loss and about 9% ($n = 9$) do not know.

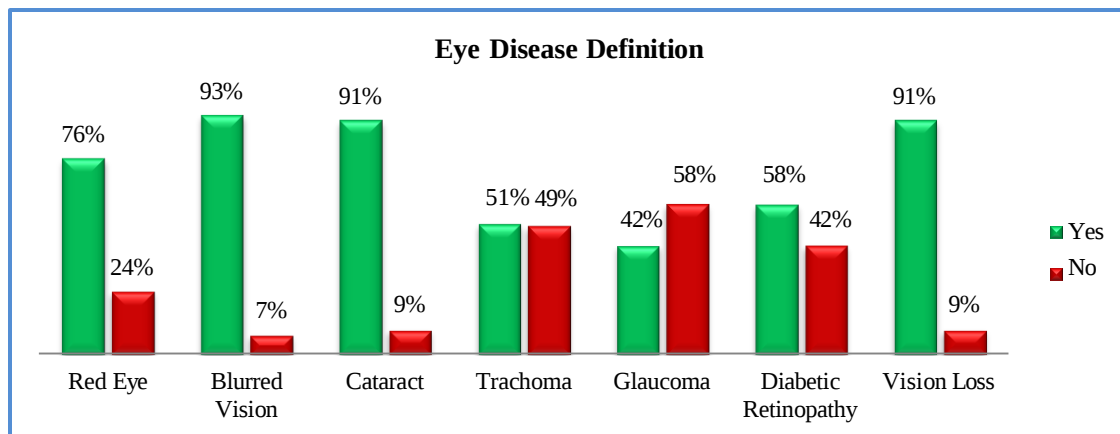


Figure 4.8: Bar diagram of students according to their knowledge on eye diseases definition in percentage.

4.2.3 Knowledge on eye diseases that may cause vision loss.

From the statistical data in the table and Figure shows that about 57% (□ = 54) among 95 students has knowledge on red eye that may cause vision loss and 43% (□ = 41) has no knowledge on this. For Blurred vision 78% (□ = 74) know that it may cause vision loss and 22% (□ = 21) do not know about it. About 83% (□ = 79) know that cataract may cause vision loss and 17% (□ = 16) do not know about it. 37% (□ = 35) know that trachoma may cause vision loss and 63% (□ = 60) do not know about it. 32% (□ = 30) know that glaucoma may cause vision loss and 68% (□ = 65) do not know about it. For diabetic retinopathy 57% (□ = 54) do not know it may cause vision loss, 43% (□ = 41) know about it. And 78% (□ = 74) know that vision loss may cause permanent vision loss and 22% (□ = 21) do not know about it.

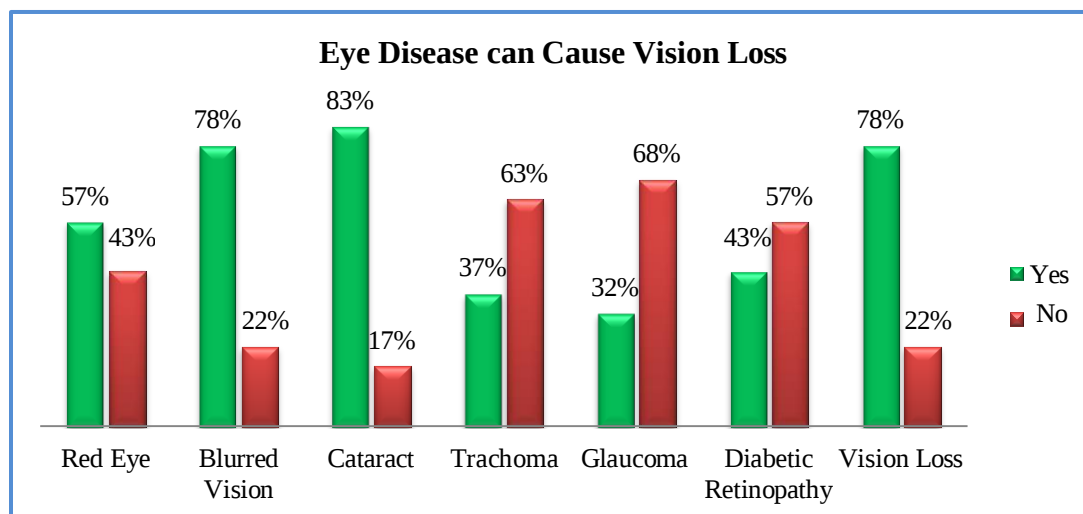


Figure 4.9: Bar diagram of students according to their knowledge on eye diseases that may cause vision loss in percentage.

4.2.4 Knowledge on eye diseases that can be prevented

The following result shows that, among 95 students about 71% ($n = 67$) know that red eye can be prevented and 29% ($n = 28$) do not know that. For Blurred vision about 87% ($n = 83$) know that it can be prevented and 13% ($n = 12$) has no knowledge about it. 86% ($n = 82$) know that cataract can be prevented and 14% ($n = 13$) do not know about it. For trachoma 41% ($n = 39$) know that trachoma can be prevented and 59% ($n = 56$) don't know it. For glaucoma 40% ($n = 38$) know that it can be prevented and 60% ($n = 57$) don't know about it. For diabetic retinopathy 45% ($n = 43$) do not know it can be prevented and 55% ($n = 52$) know it. And for vision loss 63% ($n = 60$) know that it can be prevented and 37% ($n = 35$) students do not know about it.

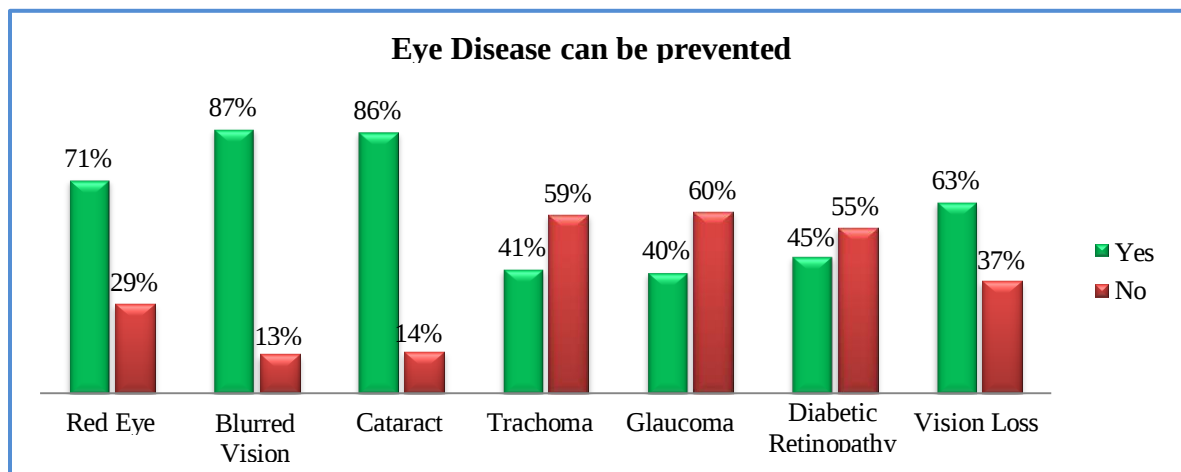


Figure 4.10: Bar diagram of students according to their knowledge on eye diseases that can be prevented in percentage.

4.3 Prevalence of Eye Diseases

4.3.1 Students suffer from eye diseases

The following data shows that 42% ($n = 42$) students are free from any eye disease and rest of the students 58% ($n = 58$) students are suffering from common eye Diseases.

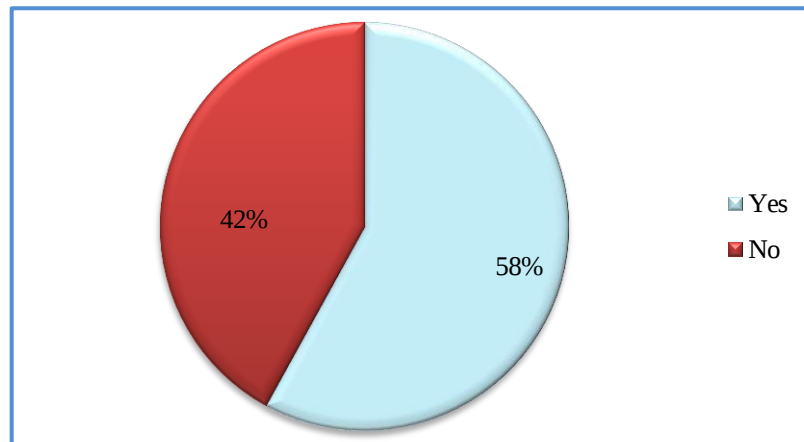


Figure 4.11: Pie chart of students according to suffer from any eye disease in percentage.

4.3.2 Common eye diseases that is very frequent

The students who are suffering from common eye diseases among them blurred vision is maximum about 72.4% ($\square = 42$) are suffering from it. And the percentages of rest of the students who are suffering from cataract, glaucoma, red eye and trachoma are 3.4% ($\square = 2$), 17.2% ($\square = 10$) and 6.9% ($\square = 4$) respectively.

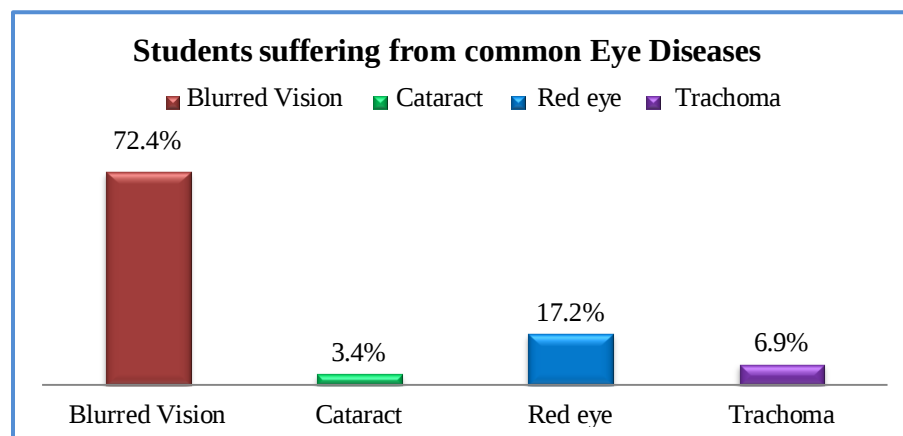


Figure 4.12: Bar diagram of students according to eye diseases in percentage.

4.3.3 Other Disease

About 94% (n = 94) students are suffering from other diseases and 6% (n = 6) are free from any other diseases.

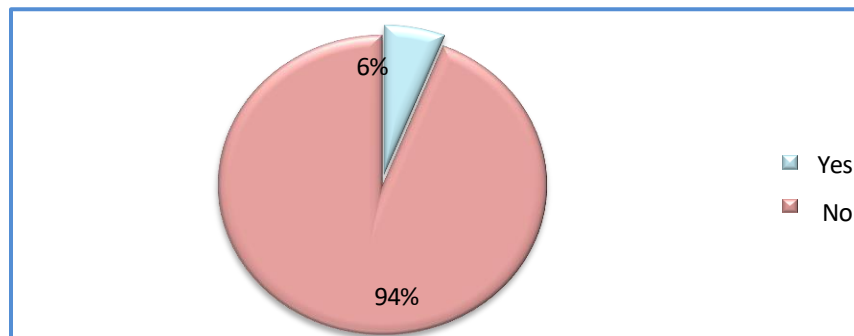


Figure 4.13: Pie chart of students according to suffering from other disease in percentage.

4.3.4 Other Disease that is very frequent

Following table and Figure shows that most of the students who are suffering from other diseases among them 33.3% (n = 2) are suffering from Tumor. 16.7% (n = 1) suffering from Anaemia disease, 33.3% (n = 2) suffering from Asthma and 16.7% (n = 1) suffering from Peptic.

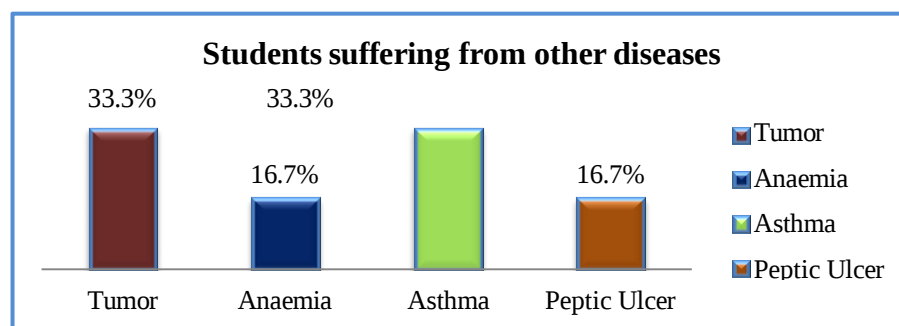


Figure 4.14: Bar diagram of students according to suffering from other diseases when if yes.

4.3.5 Current eye problem

The result shows that, about 55%($n = 33$) students are doing nothing for their eye disease and among rest of the students 5%($n = 3$) taking home remedy and 40% ($n = 24$) go to eye care provider.

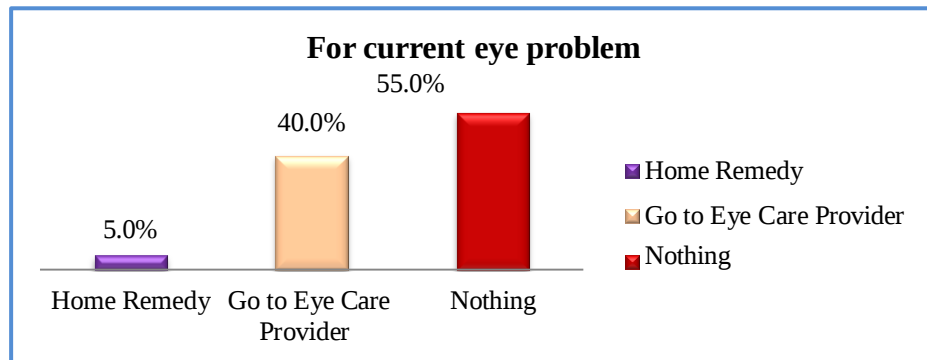


Figure 4.15: Bar diagram of students according to their current eye problem in percentage.

4.3.6 Checking of Eyes

According to my work 45%($n = 45$) has never checked their eyes by ophthalmologist or physician and 55%($n = 55$) students has checked their eyes.

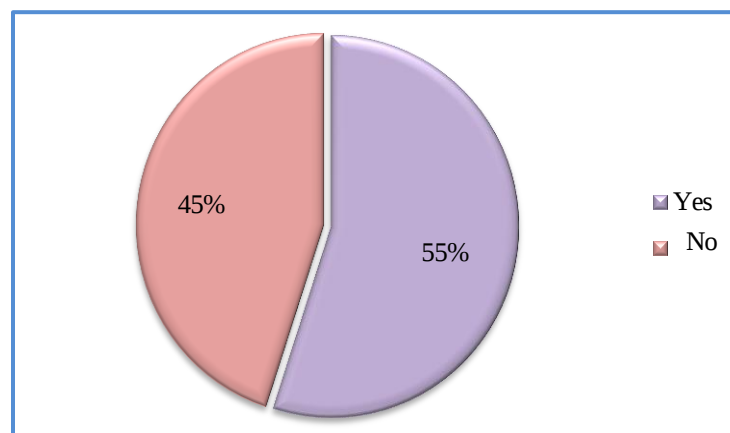


Figure 4.16: Pie chart of students according to their checking of eyes in percentage.

4.3.7 Frequency of Checking Eyes

From the analytical data in following table and Figure we see that about 67.3% ($n = 37$) check their eyes by ophthalmologist when they face problem and among rest of the students about 18.2% ($n = 10$) check their eyes once a year and 14.5% ($n = 8$) check their eyes 2-3 times in a year.

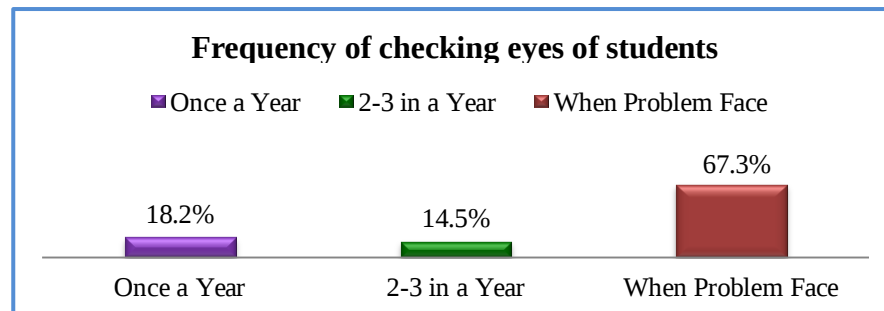


Figure 4.17: Bar diagram of students according to their frequency of checking eyes.

4.3.8 Person by whom students checked their eyes

Among the students having eye disease about 23.2% ($n = 13$) has checked their eyes by MBBS doctor, 75% ($n = 42$) checked their eyes by ophthalmologist.

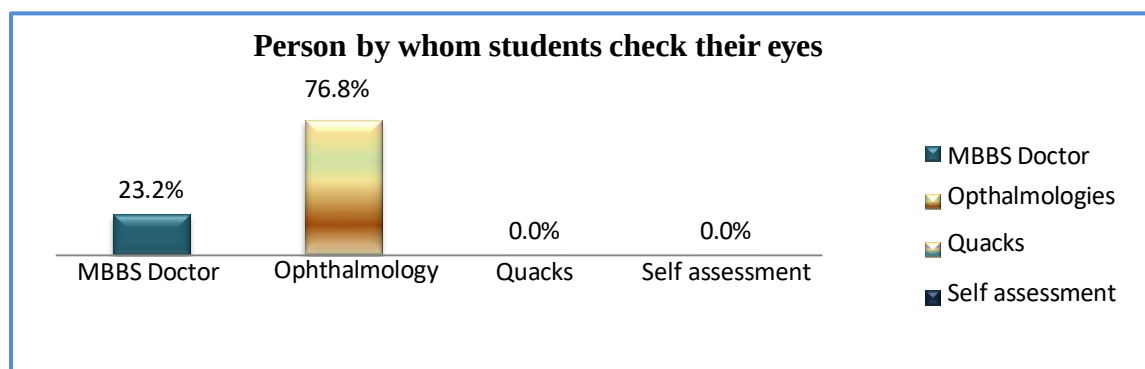


Figure 4.18: Distribution of students according to the person by whom they check their eyes.

4.3.9 Use Spectacle

Among the students about 52% (□ = 52) use spectacle and about 48% (□ = 48) do not use spectacle.

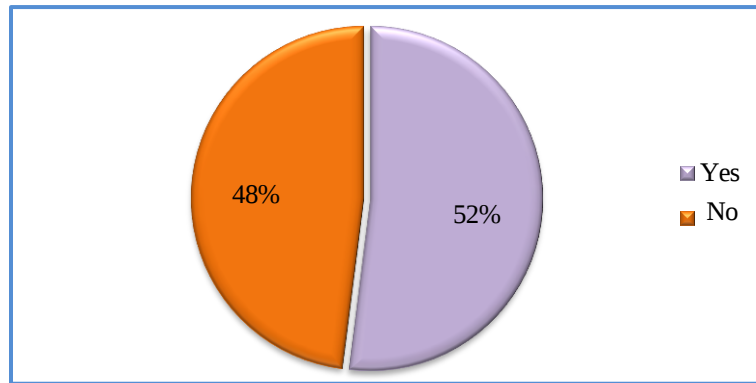


Figure 4.19: Pie chart of the students according to using of spectacle in percentage.

4.3.10 Reasons for Using Spectacle

Among the students about 69.2% (□ = 36) use spectacle for clear vision, about 11.5% (□ = 6) use spectacle for eye protection, about 7.7% (□ = 4) use spectacle for reading and 11.5% (□ = 6) use spectacle for fashion.

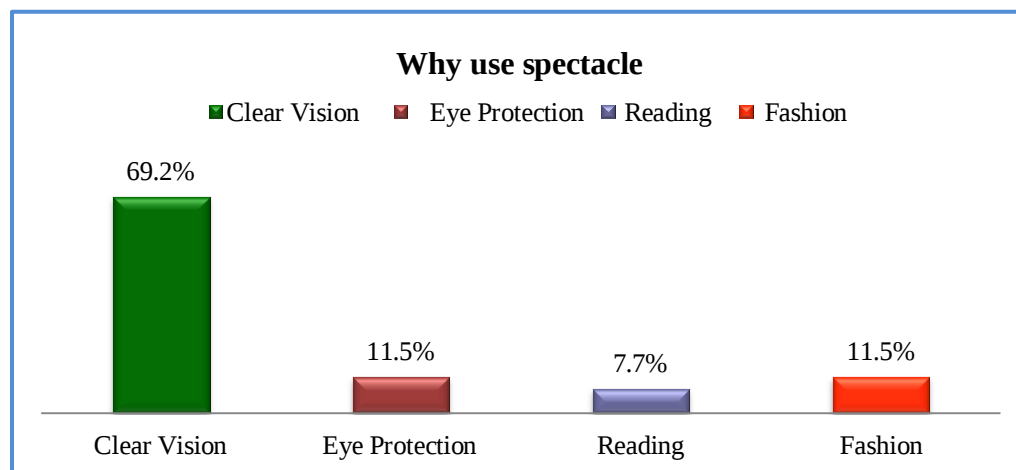


Figure 4.20: Bar diagram of students according to reasons for using spectacle.

4.3.11 Knowledge about eye care services

From following data we observed that, about 74% (□ = 74) students have knowledge about eye care services and about 26% (□ = 26) have no knowledge about eye care services.

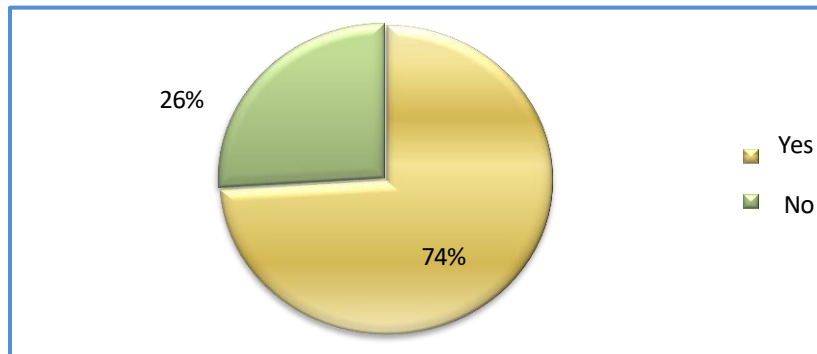


Figure 4.21: Pie chart of the students according to their knowledge on eye care services.

4.3.12 Preferable place for eye care service

The result shows that, about 31.1% (□ = 23) students prefer chamber for eye care services, 29.7% (□ = 22) prefer Clinic and the rest about 39.2% (□ = 29) students prefer hospital for their eye care services.

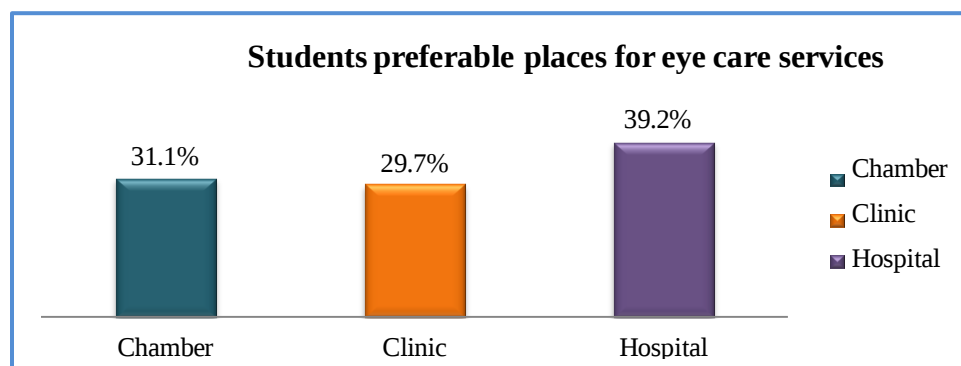


Figure 4.22: Bar diagram of students according to their preferable places for eye care services in percentage.

4.3.13 Source of information

Among the students about 62% ($n = 62$) know about eye disease and eye care services from their family members and relatives. Among rest of the students about 13% ($n = 13$) know information from internet, 7.0% ($n = 7$) know through reading books, 14% ($n = 14$) know about it from physicians and 4% ($n = 4$) know about it by internet.

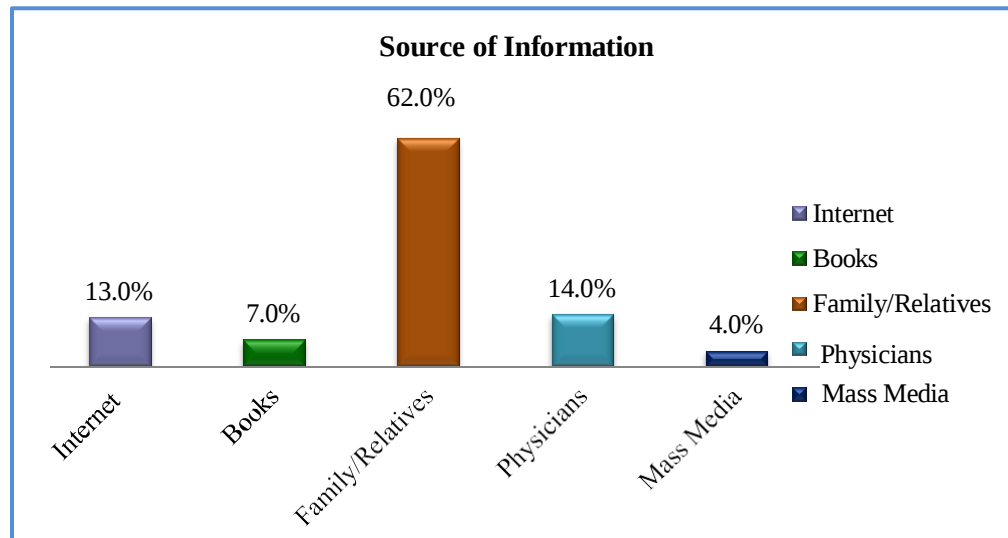


Figure 4.23: Bar diagram of students according to source of information in percentage.

4.3.14 Knowledge about Treatment

The following result shows that, about 86.0% ($n = 86$) students have knowledge about the treatment of eye disease and about 14% ($n = 14$) have no knowledge about eye disease treatment.

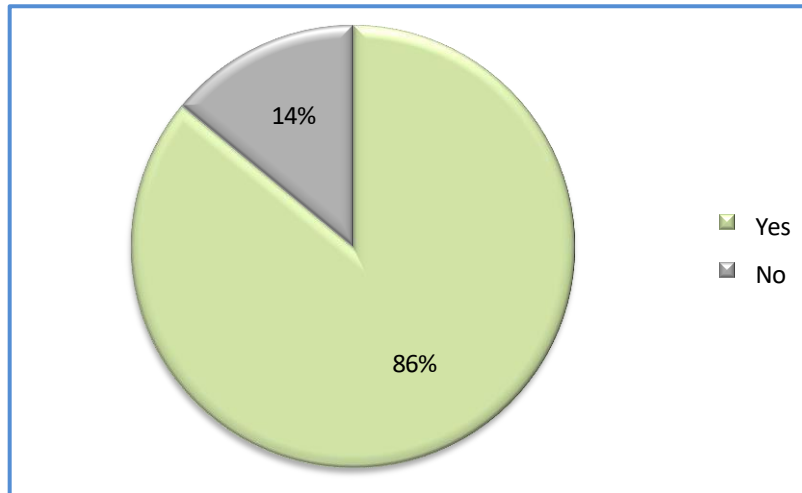


Figure 4 .24: Pie chart of students according to knowledge about treatment in percentage.

4.3.15 Knowledge about Type of Treatment

Following table and Figure shows that, about 84.9%(□ = 73) students have knowledge about medicinal treatment and15.1%(□ = 13) have knowledge about surgery of eye disease.

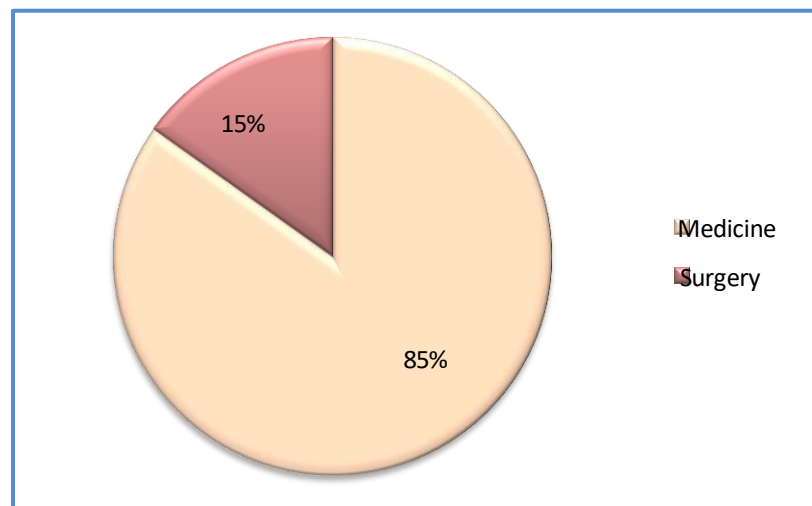


Figure 4.25: Pie chart of students according to knowledge about Treatment in percentage.

4.3.16 Awareness of Risk Factor

About 76% (□ = 76) students know about the risk factor (sunlight, smoking, obesity) and 24% (□ = 24) students have no knowledge about risk factors of eye diseases.

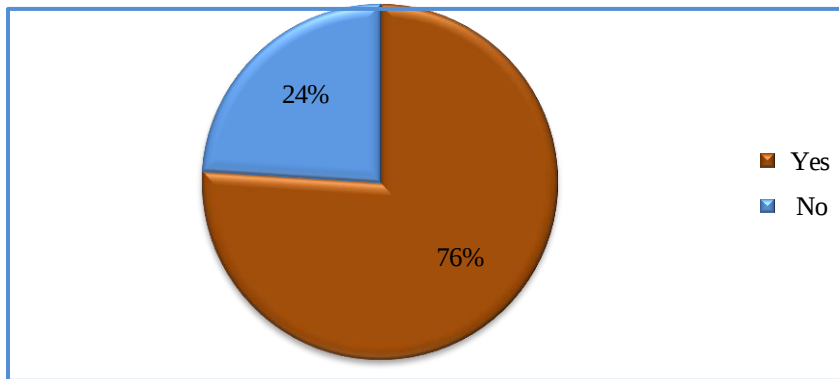


Figure 4.26: Pie chart of students according to their awareness of risk factor in percentage.

4.3.17 Eye care campaign

The survey result shows that, about 90% (□ = 90) never take part in any eye care campaign and only 10% (□ = 10) take part in eye care campaign.

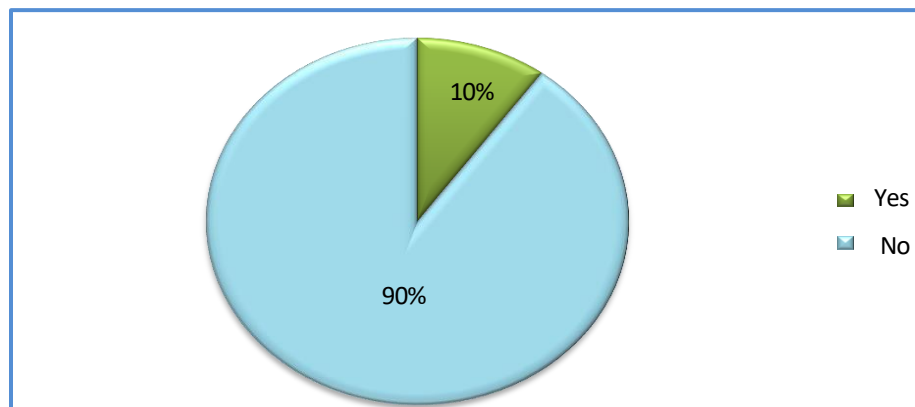


Figure 4.27: Pie chart of students according to take part of eye care campaign in percentage.



Chapter Five

Discussion

Discussion

Eye diseases are increasingly becoming the primary cause of vision loss in many low and middle-income as well as industrialized countries. Three eye conditions, namely Diabetic Retinopathy, Glaucoma, and Cataract, have emerged as potential threats to the vision of their populations. The rise in diabetes prevalence has led to the prioritization of diabetic retinopathy, while glaucoma, a long-standing eye disease, remains on the public health agenda. Additionally, cataract poses significant concerns.[46]

The primary objective of this study is to assess the current level of knowledge and awareness regarding common eye diseases.

The study was conducted among a population of 100 undergraduate students at a private university in Dhaka city, Bangladesh, with 66% being male and the remaining 34% female. The age range of the sample was between 18 to 29 years, with a majority (86%) belonging to the middle-class family category.

During the study, it was observed that 95% of students were familiar with common eye diseases. This finding aligns with similar observations in studies by Dandona et al. and Chew, Reddy, and Karina, albeit in older age groups. The knowledge levels of eye diseases in these studies were reported as 69.8% and 88.2%, respectively.[47]

Among the students, 76% were knowledgeable about the definitions of red eye, 93% about blurred vision, 91% about cataract, and vision loss.

The primary sources of knowledge were family, friends, or relatives (62%), followed by the internet (13%), physicians (14%), and TV/media/newspapers (4%). Surprisingly, only 7.0% acquired knowledge through academic studies or teachers.

Regarding treatment, while students were aware that surgery was necessary for cataracts, diabetic retinopathy, and vision loss, about 85% were unaware of the specific types of surgery. Only 15% were knowledgeable about surgery, while 85% were familiar with medicinal treatments for eye diseases.

In terms of awareness about glaucoma, only 42% of students demonstrated moderate awareness, which aligns with similar studies by Ronnie et al. and Rewri and Kakkar. [48]

However, awareness about cataracts was relatively high, with about 91% of students demonstrating awareness, consistent with findings from previous studies. While 95% of participants correctly understood the definitions of common eye diseases, only 40% and 41% were aware that glaucoma

and trachoma, respectively, could be prevented. [49]

Regarding blurred vision, 93% of participants were aware of the disease, and 78% correctly identified its causes.

It was noted in the study that approximately 45% of participants were unaware of the recommended frequency of eye checkups, a finding similar to the study by Tajunisah, Wang, and Tan, where 43.8% were unsure of the frequency of eye checkups and 72.3% were unaware of available treatments. [50]

Awareness about Blurred vision is spectacular in the present study. 93% of the people were aware of the disease and again 78% of correctly know the right cause of vision loss.

In our present study it was observed that around 45% didn't know the frequency of eye checkup. The study of Tajunisah, Wang and Tan resulted that 43.8% didn't have learning about how frequent they should go for an eye checkup and 72.3% didn't know about what treatments were available. [51]



Chapter Six

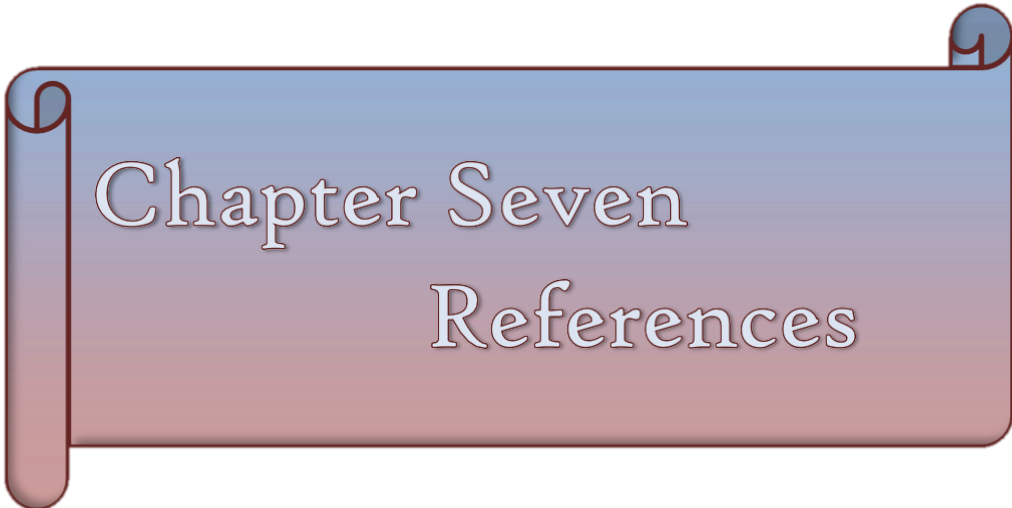
Conclusion

Conclusion

In conclusion, the study highlights significant gaps in knowledge and awareness regarding eye diseases among the undergraduate students at a private university in Dhaka city, Bangladesh. While a majority of students demonstrated familiarity with these diseases, there were notable discrepancies in awareness levels across different conditions. While cataracts were relatively well-understood, conditions such as glaucoma and trachoma showed lower levels of awareness. Moreover, while students were aware of the necessity of treatment, particularly surgical intervention for certain eye conditions, there was a lack of understanding regarding specific treatment modalities. This underscores the need for comprehensive health education initiatives to improve awareness and knowledge among students, thereby potentially reducing the prevalence of vision loss.

Furthermore, the study suggests that the sources of knowledge varied, with a significant reliance on family, friends, and the internet. This indicates the importance of leveraging multiple channels, including educational institutions, healthcare providers, and media, to disseminate accurate information about eye health.

Overall, the findings underscore the urgent need for targeted health education programs and awareness campaigns to bridge the knowledge gap and empower individuals to take proactive measures in preserving their vision. Additionally, further research on a larger scale is recommended to gain a more comprehensive understanding of awareness levels and to inform more effective public health interventions in addressing eye diseases.



Chapter Seven References

References

1. The Human Eye Available at <http://www.odec.ca/projects/2006/thog6n2/importance.html>
2. The Eye: the most important sensory organ of the human being Available at <http://www.augenklinik-stralsund.de/en/clinical-characteristics/the-eye-the-most-important-sensory-organ-of-the-human-being>
3. Anatomy, parts and structure of Eye Available at <http://www.onlinebiologynotes.com/human-eye-anatomy-parts-structure/>
4. World Health Organization, Global Data on Visual Impairments 2010, 2012.
5. Kaneez Fatima, ErumShahid, ArshadShaikh, “Frequency of Common Eye Diseases in Pediatric Outpatient Department of A Tertiary Care Hospital”, Pak J Ophthalmol 2015, Vol. 31 No. 3.
6. Friday S. Wokoma, T. Ichenwo, “Pattern of Eye Disorders in Ogbodo: A Rural Community in Rivers State, Nigeria”, The Nigerian Health Journal, Vol. 11, No 1, (January - March, 2011).
7. Petricek I, Prost M, Popova A. The differential diagnosis of red eye: a survey of medical practitioners from Eastern Europe and the Middle East. Ophthalmologica, 2006; 220:229-37.
8. RED EYES: CAUSES AND TREATMENT available at www.narayananeethralaya.org/red-eyes-causes-treatment/
9. Symptoms Are Associated With Red Eyes, available at <https://www.eyehhealthweb.com/red-bloodshot-eyes/>
10. RED EYES: CAUSES AND TREATMENT available at www.narayananeethralaya.org/red-eyes-causes-treatment/
11. Blurry Vision In One Eye Or Both Eyes is available at www.allaboutvision.com/conditions/blurry-vision.htm
12. Cataract is available at <https://www.mayoclinic.org/diseases-conditions/cataracts/symptoms-causes/syc-20353790>

13. Adamu MD, Mpyet C, Nasiruet M, et al. Prevalence of Trachoma in Niger State, North Central Nigeria: Results of 25 Population Based Prevalence Surveys Carried Out with the Global Trachoma Mapping Project. *Ophthalmic Epidemiology*, 2016; 23: 63–69
14. Muhammad N, Damina M, Umar MM et al. Trachoma prevalence and risk factors in eight local government areas of Zamfara State. *Niger J Ophthalmol*, 2015; 23: 48-53
15. Risk factor of Trachoma. Available: <https://www.mayoclinic.org/diseases-conditions/trachoma/basics/risk-factors/con-20025935>, e
16. Rahman MM, Rahman N, Foster PJ, et al. The prevalence of glaucoma in Bangladesh: a population based survey in Dhaka division. *Br J Ophthalmol*, 2004; 88: (12).1493-7.
17. Maharana PK, Rai VG, Pattebahadur R, et al. Awareness and Knowledge of Glaucoma in Central India: A Hospital-Based Study. *Asia Pac J Ophthalmol (Phila)*, 2017; 6: 243-249
18. <https://www.mayoclinic.org/diseases-conditions/diabetic-retinopathy/symptoms-causes/syc-20371611>
19. Maharana PK, Rai VG, Pattebahadur R, et al. Awareness and Knowledge of Glaucoma in Central India: A Hospital-Based Study. *Asia Pac J Ophthalmol (Phila)*, 2017; 6: 243-249
20. Maberley DA, Hollands H, Chang A, et al. The prevalence of low vision and blindness in a Canadian inner city. *Eye (Lond)*, 2007; 21: 528-33.
21. Nasiru M, et al. Prevalence and Causes of Blindness and Visual Impairment in Sokoto State, Nigeria: Baseline Data for Vision 2020: The Right to Sight Eye Care Programme. *Middle East African Journal of Ophthalmology* 2011, Vol. 18, No. 2.
22. Jay C. Erie, Md, John A. Butz, Ba, Jonathan A. Good et al.: Heavy Metal Concentrations in Human Eyes. *Am J Ophthalmol* 2005; 139: 888–893.
23. Khatri B, Kashif A. Pattern of Common Eye Diseases in Children in a Tertiary Eye Hospital, Karachi. *Pak J Ophthalmol* 2014, Vol. 30 No. 4
24. Zhou BJ, Guan HJ, Yang XJ, et al. A study on the awareness of cataract disease and treatment options in patients who need surgery in a rural area of Eastern China. *Eur J Ophthalmol*, 2008; 18: 544- 550.

25. Taylor HR, Keeffe JE, Rochtchina E, et al. Vision loss in Australia. *Med J Aust*. 2005; 182: 565-8. Maberley DA, Hollands H, Chang A, et al. The prevalence of low vision and blindness in a Canadian inner city. *Eye (Lond)*, 2007; 21: 528-33.
26. Xu J, He M, Wu K, et al. The prevalence of cataract in Doumen County, Guangdong Province. *Chinese J Ophthalmol*, 1999; 35: 465-7
27. Mehari ZA. A study of ocular morbidity of patients attending ophthalmic outreach services in rural Ethiopia. *International Journal of Medicine and Medical Sciences* 2013; Vol. 3 (4), pp. 450-454.
28. Chipendo GN, January J, Tapera R et al. Community perceptions of eye diseases among 14-40 yearolds in Chiota, Zimbabwe. *Educational Research* 2012; Vol. 3(10) pp. 780-784.
29. Rahman MM et al. The prevalence of glaucoma in Bangladesh: a population based survey in Dhaka division. *Br J Ophthalmol* 2004; 88: pp.1493–1497.
30. Waleed AR, Amro K. Bin Abdulrahman, Ahmed A. Zarban et al.: Public Awareness regarding Common Eye Diseases among Saudi Adults in Riyadh City: A Quantitative Study. *Journal of Ophthalmology* 2017:5
31. Maberley D, Hollands H. et al. The prevalence of low vision and blindness in a Canadian inner city. *Nature Publishing Group. Eye* 2007; (21): 528–533.
32. Dandona R, Dandona L, Rajesh K. John, et al.: Awareness of eye diseases in an urban population in southern India. *Bulletin of the World Health Organization*, 2001, 79 (2).
33. Gupta P, Zheng Y, Ting TW, et al. Prevalence of cataract surgery and visual outcomes in Indian immigrants in Singapore: the Singapore Indian eye study. *PLoS One*, 2013; 8: 523-528
34. Rosman M, Zheng Y, Lamoureux E et al.: Review of key findings from the Singapore Malay Eye Study (SiMES-1). *Singapore Med J* 2012; 53(2) : 82
35. UbahJN, Adeoti CO, Isawumi MA, et al. Common causes of red eye presenting at an ophthalmic clinic. *Niger J Med*, 2006; 15:144-147.
36. Muhammad N, Damina M, Umar MM et al. Trachoma prevalence and risk factors in eight local government areas of Zamfara State. *Niger J Ophthalmol*, 2015; 23: 48-53.
37. Thapa SS et al. Prevalence of visual impairment, cataract surgery and awareness of cataract and glaucoma in Bhaktapur district of Nepal: The Bhaktapur Glaucoma Study. *BMC*

Ophthalmology 2011, 11:2

38. Yau JW, Rogers SL, Kawasaki R, et al. Global prevalence and major risk factors of diabetic retinopathy. *Diabetes Care*, 2012; 35: 556-64.
39. John Neena, Jose Rachel, et al. Rapid Assessment of Avoidable Blindness in India. *PLoS ONE* 2008; Vol. 3: 8
40. Bharath B, Krishnaiah S, Imtiaz A, Ramani RV. Prevalence and determinants of cataract surgical coverage in India. *International Journal of Community Medicine and Public Health* 2017; Vol. 4, No2.
41. Fatima K, Shahid E, Shaikh A. Frequency of Common Eye Diseases in Pediatric Outpatient Department of A Tertiary Care Hospital. *Pak J Ophthalmol* 2015, Vol. 31 No. 3.
42. Puri SK et al. A study of awareness and knowledge about cataract among students. *International Journal of Research in Medical Sciences* 2016; Vol. 4:4.
43. Christen WG, Manson JE, Seddon JM, et al. A prospective study of cigarette smoking and risk of cataract in men. *JAMA*, 1992; 268: 989-93.
44. Dhaka city. Available at <http://www.lged.gov.bd/DistrictHome.aspx?district=48> [Accessed 05 May 2017].
45. Chew Y, Reddy S, Karina R. Awareness and Knowledge of Common Eye Diseases among the Academic Staff (Non-Medical Faculties) of University of Malaya. *Medical Journal of Malaysia* 204, 59(3), p.305-311.
46. Dandona R, Dandona L, Rajesh K. John, et al.: Awareness of eye diseases in an urban population in southern India. *Bulletin of the World Health Organization*, 2001, 79 (2).
47. Rewri, P. and Kakkar, M. (2014). Awareness, knowledge, and practice: A survey of glaucoma in north indian rural residents. *Indian Journal of Ophthalmology*, 62(4), p.482.
48. Dandona R, Dandona L, Rajesh K. John, et al.: Awareness of eye diseases in an urban population in southern India. *Bulletin of the World Health Organization*, 2001, 79 (2).
49. Rewri, P. and Kakkar, M. (2014). Awareness, knowledge, and practice: A survey of glaucoma in north indian rural residents. *Indian Journal of Ophthalmology*, 62(4), p.482.
50. Tajunisah I, Wong P, Tan L. Awareness of eye complications and prevalence of retinopathy in the first visit to eye clinic among type 2 diabetic patients. *International Journal of Ophthalmology* 2011, 4(5), p.519-524.