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Prevalence of Eye Diseases and Visual Impairments Among Patients in Debre Markos Referral Hospital Eas Gojjam Zone, Amhara Regional State, Ethiopia

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Approval Sheet

Prevalence of Eye Diseases and Visual Impairments Among Patients in Debre Markos Referral Hospital Eas Gojjam Zone, Amhara Regional State, Ethiopia

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Declaration

I hereby declare that, this thesis entitled" Prevalence of Eye Diseases and Visual Impairments in Debre Markos Referral Hospital East Gojjam Zone, Amhara Regional State, Ethiopia" and the work presented in its my original work and has not been presented for any of graduated students in other university and that all sources of materials have been duly acknowleged.

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Acronyms/Abbreviations

C.B.R	Community Based Rehabilitation
HM	Hand Movement
HRQOL	Health related quality of life
ICD-10	International Classification of Diseases
NPL	No Perception of Light
VA	Visual Acuity
VI	Visual Impairment
WHO	World Health Organization

Abstract

Eye diseases are conditions that affect any part of the eye and include conditions that affect the structures immediately around the eyes. These conditions could develop quickly, more slowly, or last for a long time. The overall objective of this study was to assess the prevalence of eye diseases and visual impairments among patients who were admitted to Debre Markos referral hospital. To achieve this, retrospective data was collected from 2019–2023 and analyzed using tables, charts, and percentages. A total of 61,946 patients were examined in Debre Markos referral hospital, Medical Center, over a period of 2019–2023. To determine the prevalence of eye diseases and visual impairment the retrospective data of five years was used. Age, gender and visual acuity were noted from the case records. Cataract (16,302; 26.4%) was the most common eye disease observed in our study, followed by Presbyopia (12,744; 20.6%). Glaucoma was seen in 8,566 (13.9%) patients. Moreover, 132 had monocular blind, 20 binocular blind and 25 visual impairment patients were registered. From the findings of this study, it can be concluded that cataracts, Presbyopia, and glaucoma have a high prevalence rate compared to others. In general, the eye disease records were highly observed at the productive age level, which is between 15 and 64 years. This is highly dangerous for the national economy by minimizing productivity and increasing medical costs, Based on this finding; we can recommend that the government and other stakeholders should plan to alleviate the problem.

Keywords/Phrases: eye diseases, visual impairment, cataract, Debre Markos referral hospital, East Gojjam Zone, Amhara region Ethiopian

1. Introduction

1.1. Background of the Study

Eye diseases are conditions that affect any part of the eye and include conditions that affect the structures immediately around the eyes. This condition could develop quickly, develop more slowly, or last a long time. The eyeball itself is where most eye diseases happen, but it is not the only place where the disease occurs; it also affects the eye muscles, eye socket, eyelids, or the skin and muscles immediately around the eyes (Mackenzie and Hewson, 1995).

The burden of a condition (such as visual impairment) in a specific area at a given point in time is indicated by prevalence estimates. Accurate prevalence estimates are necessary for planning for health care services, associated costs, and the condition's effect on quality of life. These data are also crucial for organizing prospective research projects, like disease prevention and treatment-controlled clinical trials. Measuring temporal trends is made possible by periodic estimates of prevalence, which is crucial, particularly when new, expensive interventions are being implemented (Klein and Klein, 2013).

The differences in vision loss and vision-threatening conditions between racial and ethnic groups, as well as between age, income, and education levels, are reflected in the prevalence estimates (Klein and Klein, 2013). In addition to these characteristics, environmental and nutritional factors may have an impact on group differences in prevalence. Independent from actual differences, variations in case definition may be the cause of observed variations. When it comes to eye disorders, this could be based on the patient's self-reported history, the results of a clinical examination, or imaging (such as optical coherence tomography, film fundus photography, or digital fundus photography). The capacity to estimate prevalence, detect temporal trends, and identify cohort effects may be further complicated by variations in the diagnostic techniques used to classify conditions (phenotypes) (Wu *et al.,* 2017).

Eye problems are known to have a negative impact on quality of life. The occurrence of eye diseases is influenced by an individual's socioeconomic status, geographic location, and

accessibility to facilities (Prokofyeva and Zrenner., 2012). The vision of patients (best corrected visual acuity in the better eye) was classified into four main groups based on the international classification of diseases established by the World Health Organization (WHO): no visual impairment (6/6–6/18), visual impairment (<6/18–6/60), severe visual impairment (6/60–3/60), and blindness (<3/60—no perception of light) (Buch *et al.,* 2001). The updated definition from the World Health Organization (WHO, 2010) states that it is characterized as presenting a visual acuity score of less than 6/18 in the worst eye for distance. According to the WHO Consultation and the Resolution of the International Council of Ophthalmology, moderate VI, severe VI and blindness are classified by showing visual acuity worse than 6/18, 6/60, and 3/60, respectively

Through an extended period of disability, diseases that cause visual impairment are known to significantly influence an individual's quality of life. Researchers have concluded that the primary causes of eye problems are trauma, environmental risks, and the demographics of the sensitive population geographical, economical, social, and political. Age and gender are two more characteristics that affect the population's prevalence of eye problems (Eye Diseases Prevalence Research Group, 2004)

.Approximately 266.6 million moderate or severe visual impairment cases exist globally. The primary causes include uncorrected refractive error (116.3 million), cataracts (52.6 million), diabetic retinopathy (26.6 million), age-related macular degeneration (8.4 million), and glaucoma (4.0 million) (Lund *et al.,* 2005).visual impairment is still a significant public health issue, especially in low- and middle-income nations, where the prevalence is thought to be four times higher than in high-income nations. Visual impairment has an impact on people's socioeconomic traits and quality of life, affecting things like social involvement, mobility, and employment rewards. Therefore, it is more difficult for them to obtain employment, manage themselves, and support their families (Weidema, 2006) .Refractive error is the primary cause of subnormal and poor vision in children between the ages of 6 and 15. Therefore, the prevalence of blindness and visual impairment has a stronger relationship with population age. Over 15 million people living in Ethiopia struggle with eye health issues, including blindness and visual impairment, which are serious public health issues.

The 2006 across-country Survey on Blindness, Visual Impairment, and Trachoma Research estimated the prevalence of blindness and visual impairment to be 1.6% and 3.7%, respectively, over the entire country (Simona, 2010). This, in terms of population, corresponds to an additional 3.1 million people with vision impairment and 1.3 million blind people. Sofar, there was no study conducted on the prevalence of eye diseases and visual impairments at the community level in the study area of Debre Markos referral hospital in the east Gojjam zone of the Amhara region, Ethiopia. Thus the aim of this study was to assess the prevalence of eye disease and visual impairments in Debre Markos referral hospital, in East Gojjam Zone, Amhara Region, Ethiopia.

1.2 Statements of the problem

The prevalence of visual impairment will the significant public health problem among people live in different socio economic and environmental conditions of the country. despite the critical role of Debre Markos referral hospital in providing health care service to the region there remains a significance knowledge gap regarding the prevalence of eye disease and visual impairment among the population it service. This lack of data hinders the development of effective prevention, treatment, and rehabilitation stratagies.limited data: Existing studies on eye health in the Debre Markos catchment area are often insufficient in scope, out dated, or lack methodological rigor.Inconsistancy data collection. Luck of population based studies: there is a need for comprehensive population based studies to accurately assess the prevalence of eye disease and identify at-risk groups. Addressing these knowledge gaps requires a systematic approach to data collection and analysis. By conducting well-designed studies and implementing standardized data collection procedures, we can obtain reliable information on the prevalence of eye diseases and visual impairment in the Debre Markos region. This will be essential for informing evidence-based intervention and improving the eye health of the population.

1.4. Objectives of the Study

1.4.1. General Objective

The overall objective of this study was to assess the prevalence of eye diseases and visual impairments among patient in Debre Markos referral hospital, in East Gojjam Zone, Amhara Region, Ethiopia.

1.4.2. Specific Objectives

- ✓ To determine the prevalence of different type of eye disease
- ✓ To determine the prevalence of visual impairment among patient
- ✓ To show the trends of eye disease in Debre Markos referral hospital

1.3. Research Question

The study was conducted to answer the following proposed questions:

- ✓ What is the prevalence of different type of eye disease?
- ✓ What is the prevalence of visual impairment among patient?
- ✓ What are the trends of eye disease in patients at Debre Markos Hospitals?

2.Related Literature Review

2.1 Definition

Eye diseases are conditions that affect any part of the eye and include conditions that affect the structures immediately around the eyes. This condition could develop quickly, develop more slowly, or last a long time. The eyeball itself is where most eye disease happens, but it is not the only place where the disease occurs; it also affects the eye muscles, eye socket, eyelids, or the skin and muscles immediately around the eyes (Mackenzie and Hewson, 1995).

The partial or complete loss of ability to perceive visual stimuli is known as visual impairment, or VIP. Without treatment such as: - medical attention, assistive technology, or corrective eyewear visual impairment can make it difficult for a person to do everyday activities like walking and reading (Zhao, 2023).

2.2 Over view of visual impairment and blindness

Vision, the most dominant of our senses, plays a critical role in every facet and stage of our lives. We take vision for granted, but without vision, we struggle to learn, to walk, to read, to participate in school and to work. Vision impairment occurs when an eye condition affects the visual system and its vision functions. Everyone, if they live long enough, will experience at least one eye condition in their lifetime that will require appropriate care (Pallasmaa, 2024).

Vision impairment has serious consequences for the individual across the life course. Many of these consequences can be mitigated by timely access to quality eye care. Eye conditions that can cause vision impairment and blindness – such as cataract or refractive error – are, for good reasons, the main focus of eye care strategies; nevertheless, the importance of eye conditions that do not typically cause vision impairment – such as dry eye or conjunctivitis – must not be overlooked. These conditions are frequently among the leading reasons for presentation to eye care services (Sampogna, 2013).

2.3. Concept of Visual Impairment

The several characteristics of vision function include color vision, stereovision, contrast sensitivity, peripheral vision or visual field (the range of an individual's sight), and central vision

(the distance and clarity of an individual's vision) (Bigun, 2006).Vision impairment means that a person's eyesight cannot be corrected to a "normal" level. Vision impairment may be caused by a loss of visual acuity, where the eye does not see objects as clearly as usual. It may also be caused by a loss of visual field, where the eye cannot see as wide an area as usual without moving the eyes or turning the head (Sardegna & Shelly., 2002).

There are different ways of describing how severe a person's vision loss is. The World Health Organization defines "low vision" as visual acuity between 20/70 and 20/400, with the best possible correction, or a visual field of 20 degrees or less. "Blindness" is defined as a visual acuity worse than 20/400, with the best possible correction, or a visual field of 10 degrees or less. Someone with a visual acuity of 20/70 can see at 20 feet what someone with normal sight can see at 70 feet. Someone with a visual acuity of 20/400 can see at 20 feet what someone with normal sight can see at 400 feet. A normal visual field is about 160-170 degrees horizontally. Vision impairment severity may be categorized differently for certain purposes. In the United States, for example, we use the term "legal blindness" to indicate that a person is eligible for certain education or federal programs. Legal blindness is defined as a visual acuity of 20/200 or worse, with the best possible correction, or a visual field of 20 degrees or less (Freeman, 2024).

Visual acuity alone cannot indicate how much a person's life will be affected by vision loss. It is important to also assess how well a person uses the vision they have. Two people may have the same visual acuity, but one may be able to use his or her vision better to do everyday tasks .Most people who are "blind" have at least some usable vision that can help them move around in their environment and do things in their daily lives. A person's functional vision can be evaluated by observing them in different settings to see how they use their vision (Colenbrander, 2003).

2.4. Characteristics of Visual Impairments

There are a number of characteristics associated with visual impairment (Bakkar *et al*., 2018).
Some common visual impairment characteristics include.

1. Reduced visual acuity: The patients have difficulty seeing objects from near or close vision.
2. Blurred vision: Objects appear hazy or out of focus.
3. Tunnel vision: limited ability to see things from the side, above, or below central vision.
4. Light sensitivity: pain or discomfort when exposed to bright light.

5. Night blindness: Difficulty adjusting to low or dim light.

2.5. Classification of visual impairment and blindness

Every nation defines blindness differently for social and legal reasons. In order to facilitate international comparisons, a WHO study panel advocated in 1972 a common definition of blindness and VI as well as a standardized testing procedure due to the vast variances in requirements (Vashist *et al*., 2017). The 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) now includes this; for the purposes of this study, blindness and the VI classification would be utilized in Table 1.

Table 1: Classification of VI and blindness (WHO, 2003)

Visual acuity	Classification
6/6 – 6/18	Normal vision
<6/18 – 6/60	Visual Impairment
<6/60 – 3/60	Severe Visual Impairment
<3/60	Blind

Some patients had never been refracted or received correction for refractive errors and were visually impaired or even blind as a result (Gordon *et al.,* 2003). The WHO standard of best corrected VA excluded refractive errors by definition as a cause of VI, and information important for service planning was lost (Malu and Ojabo, 2014). The presenting VA should be taken into consideration when assessing the magnitude of visual disability in the community (Gordois *et al.,* 2012).

2.6. Global prevalence of visual impairment and blindness

The most up-to-date studies, WHO estimates that the number of people with visual impairment (presenting vision) is 285 million (65% of whom are aged over 50 years). Of these, 246 million

have low vision (63% over 50) and 39 million are estimated to be blind (82% over 50).These estimates were based on 50 national and sub national studies from 38 countries, published and unpublished, conducted since 2004 and on previous studies that were still representative; the majority of the 50 surveys were rapid assessments for the population 50 years and older (Bourne *et al*., 2021).

Regional estimates were calculated with a model taking into account, among other factors, the country's economic development status, after having verified the fit between data on visual impairment and development indicators. The top three causes of visual impairment are uncorrected refractive errors, cataract and glaucoma. The top three causes of blindness in the 2010 estimate were cataract, glaucoma and age-related macular degeneration (Al-Namaeh, 2021).

Given that the methodology to estimate the prevalence of visual impairment and blindness is different from the one used in previous studies, it is not possible to make a direct comparison of the magnitude and causes of visual impairment and blindness with earlier estimates. There is a global and regional reduction in visual impairment and blindness, which is demonstrated in those countries where repeat surveys over time were conducted. This is considered to be largely attributable to socioeconomic development in many countries, but also to the investment and work of governments and international partners in improving quality and quantity of eye care services and in developing the national eye health system. It is now important to increase the delivery of eye care services in all country in need. The Action plan for the prevention of avoidable blindness and visual impairment provides the roadmap for countries, WHO and international partners to secure achievements and continue to deliver services worldwide (World Health Organization, 2010).

2.7.Type and Causes of eye Disease and visual impairment

2.7.1 Cataracts

A cataract is a cloudy area in the lens of your eye (the clear part of the eye that helps to focus light). Cataracts are very common as you get older. In fact, more than half of all Americans age 80 or older either have cataracts or have had surgery to get rid of cataracts. At first,you may not notice that you have a cataract. But over time, cataracts can make your vision blurry, hazy, or less colorful. You may have trouble reading or doing other everyday activities. Over time,

cataracts can lead to vision loss. The good news is that surgery can get rid of cataracts. Cataract surgery is safe and corrects vision problems caused by cataracts (Lam *et al*., 2015).

Causes Cataracts

Aging is the most common cause. This is due to normal eye changes that begin to happen after age 40. That is when normal proteins in the lens start to break down. This is what causes the lens to get cloudy. People over age 60 usually start to have some clouding of their lenses. However, vision problems may not happen until years later.

Other reasons you may get cataracts include:

- having parents, brothers, sisters, or other family members who have cataracts
- having certain medical problems, such as diabetes
- having had an eye injury, eye surgery, or radiation treatments on your upper body
- having spent a lot of time in the sun, especially without sunglasses that protect your eyes from damaging ultraviolet (UV) rays
- Using certain medications such as corticosteroids, this may cause early formation of cataracts.
- Smoking

2.7.2 Presbyopia

Presbyopia is the medical term for your eye losing the ability to change its focus. This affects how well you can see close-up objects. It occurs as your eye's natural lens grows less flexible with aging. Presbyopia generally starts to develop around age 40 and gets worse until your mid-60s (Charman, 2008).

Cause of Presbyopia

Presbyopia is caused by a hardening of the lens of your eye, which occurs with aging. As your lens becomes less flexible, it can no longer change shape to focus on close-up images.

2.7.3 Glaucoma

Glaucoma is a group of eye conditions that damage the optic nerve. The optic nerve sends visual information from your eye to your brain and is vital for good vision. Damage to the optic nerve is often related to high pressure in your eye. But glaucoma can happen even with normal eye pressure. Glaucoma can occur at any age but is more common in older adults. It is one of the leading causes of blindness for people over the age of 60 (Bhowmik *et al*., 2012).

Causes of glaucoma

Glaucoma develops when the optic nerve becomes damaged. As this nerve gradually deteriorates, blind spots develop in your vision. For reasons that doctors don't fully understand, this nerve damage is usually related to increased pressure in the eye (Bhowmik *et al*., 2012).

Elevated eye pressure happens as the result of a buildup of fluid that flows throughout the inside of the eye. This fluid also is known as the aqueous humor. It usually drains through a tissue located at the angle where the iris and cornea meet. This tissue also is called the trabecular meshwork. The cornea is important to vision because it lets light into the eye. When the eye makes too much fluid or the drainage system doesn't work properly, eye pressure may increase.

2.7.4 Conjunctivitis

Conjunctivitis, also known as pink eye, is inflammation of the outermost layer of the white part of the eye and the inner surface of the eyelid. It makes the eye appear pink or reddish. Pain, burning, scratchiness, or itchiness may occur. The affected eye may have increased tears or be "stuck shut" in the morning. Swelling of the white part of the eye may also occur. Itching is more common in cases due to allergies. Conjunctivitis can affect one or both eyes (Lichtenstein, 2012).

The most common infectious causes in adults are viral, whereas in children bacterial causes predominate. The viral infection may occur along with other symptoms of a common cold. Both viral and bacterial cases are easily spread between people.Allergies to pollen or animal hair are also a common cause (Lichtenstein, 2012). Diagnosis is often based on signs and symptoms. Occasionally, a sample of the discharge is sent for culture.

Causes of conjunctivitis

Infective conjunctivitis is most commonly caused by a virus. Bacterial infections, allergies, other irritants, and dryness are also common causes. Both bacterial and viral infections are contagious, passing from person to person or spread through contaminated objects or water. Contact with contaminated fingers is a common cause of conjunctivitis. Bacteria may also reach the conjunctiva from the edges of the eyelids and the surrounding skin, from the nasopharynx, from infected eye drops or contact lenses, from the genitals or the bloodstream. Infection by human adenovirus accounts for 65% to 90% of cases of viral conjunctivitis (Azari, & Arabi., 2020).

2.7.5 Astigmatisms

Astigmatism is a common vision problem caused by an error in the shape of the cornea. Symptoms can differ from person to person but may include blurry vision and difficulty seeing at night. With astigmatism, the lens of the eye or the cornea, which is the front surface of the eye, has an irregular curve. This can change the way light passes, or refracts, to your retina, causing blurry, fuzzy, or distorted vision (Sinjab, 2018).

Causes of Astigmatism

It's not known what causes astigmatism, but genetics is a big factor. It's often present at birth, but it may develop later in life. It may also occur as a result of an injury to the eye or after eye surgery. Astigmatism often occurs with nearsightedness or farsightedness.

Sometimes, though, a rare condition called keratoconus causes astigmatism. This eye disease affects the cornea, causing the clear tissue on the cornea to thin and bulge out. This leads to cloudy or blurry vision, and sensitivity to bright lights. The cause of keratoconus is also unknown, but it's believed to be hereditary, too.

Keep in mind that while reading with low or dim lights can make it harder for eyes to focus, it doesn't harm vision or cause astigmatism. However, if you already have an eye with astigmatism, and you read in low light, you might notice increased blurriness.

2.7.6. Keratoconjunctivites sicca

Keratoconjunctivitis is when you have both keratitis and conjunctivitis at the same time. Keratitis is inflammation of the cornea, the clear dome that covers the iris and the pupil. Conjunctivitis is inflammation of the conjunctiva. That's the thin membrane over the white part of the eye and the inner surface of the eyelid. Conjunctivitis is also known as pink eye. There are a lot of things that can cause keratoconjunctivitis, including allergies and infections (Azari & Arabi, 2020).

Causes of keratoconjunctivitis

There are many potential causes, both infectious and noninfectious. They include: Allergens, viruses, bacteria, parasites, pollutants, genetic conditions, autoimmune disorders.

2.7.7.Trachoma

Trachoma (truh-KOH-muh) is a bacterial infection that affects the eyes. It's caused by the bacterium Chlamydia trachomatis. Trachoma is contagious, spreading through contact with the eyes, eyelids, and nose or throat secretions of infected people. It can also be passed on by handling infected items, such as handkerchiefs. At first, trachoma may cause mild itching and irritation of the eyes and eyelids. Then you may notice swollen eyelids and pus draining from the eyes. Untreated trachoma can lead to blindness. Trachoma is the leading preventable cause of blindness worldwide. Most trachoma cases occur in poor areas of Africa, where 85% of people with active disease reside. In areas where trachoma is prevalent, infection rates among children under 5 can be 60% or more (Bajaj *et al*., 2024).

Causes of Trachoma

Trachoma is caused by certain subtypes of Chlamydia trachomatis, a bacterium that can also cause the sexually transmitted infection chlamydia. Trachoma spreads through contact with discharge from the eyes or nose of an infected person. Hands, clothing, towels and insects can all be routes for transmission. In developing countries, eye-seeking flies also are a means of transmission (Bajaj *et al*., 2024).

2.7.8. Myopia

Nearsightedness is a common vision condition in which close objects look clear but far objects look blurry. The medical term for nearsightedness is myopia. Myopia happens when the shape of the eye or the shape of certain parts of the eye causes light rays to bend or refract. Light rays that should be focused on nerve tissues at the back of the eye, called the retina, are focused in front of the retina instead. Nearsightedness usually develops during childhood and adolescence. Typically, it becomes more stable between the ages of 20 and 40. It tends to run in families (Urone *et al*., 2012).

Causes of Myopia

The eye has two parts that focus images:

The cornea is the clear, dome-shaped front surface of the eye.

The lens is a clear structure about the size and shape of a pinto bean.

For you to see, light has to pass through the cornea and lens. These parts of the eye bend also called refract the light so that the light is focused directly on the retina at the back of your eye. These tissues translate light into signals sent to the brain, which lets you perceive image.

2.7.9. Cornial Ulcer

At the front of the eye is a clear layer of tissue called the cornea. The cornea is like a window that lets light enter the eye. Tears defend the cornea against bacteria, viruses, and fungi. A corneal ulcer is an open sore that forms on the cornea. It's usually caused by an infection. Even small injuries to the eye or erosion caused by wearing contact lenses too long can lead to infections(Meek and Knupp., 2015).

The main cause of corneal ulcers is infection.

- Acanthamoeba keratitis**:**This infection most often occurs in contact lens wearers. It is an amoebic infection and, though rare, can lead to blindness.

- Herpes simplex keratitis: Herpes simplex keratitis is a viral infection that causes repeated flare-ups of lesions or sores in the eye. A number of things can trigger flare-ups, including stress, prolonged exposure to sunlight, or anything that weakens the immune system.

- Fungal keratitis: This fungal infection develops after an injury to the cornea involving a plant or plant material. Fungal keratitis can also develop in people with weakened immune systems.

Other causes of corneal ulcers include:

- dry eye
- eye injury
- inflammatory disorders
- wearing unsterilized contact lenses
- vitamin A deficiency

2.7.10. Infectious keratitis

Keratitis is an inflammatory condition that affects the cornea of the eye. The cornea is the clear part that covers both the iris and the pupil. Keratitis can be caused by an infection or injury to the eye. Keratitis is a common condition. People who wear contact lenses may experience keratitis more frequently than people who don't wear contacts. In either case, you can take steps to help prevent this condition. If you do develop keratitis, see your doctor right away (Cabrera *et al*., 2022).

Cause of Infectious Keratitis

Infectious keratitis is caused by one of the following:

Bacteria:*Pseudomonas aeruginosa* and *Staphylococcus aureus* are the two most common types of bacteria that cause bacterial keratitis.It mostly develops in people who use contacts improperly.

Fungi:Fungal keratitis is caused by *Aspergillus, Candida,* or *Fusarium*. As with bacterial keratitis, fungal keratitis is most likely to affect those who wear contact lenses. However, it's also possible to be exposed to these fungi outdoors

Parasites: An organism called *Acanthamoeba* has become more common in the United States in those wear contact lenses. The parasite lives outdoors and may be picked up by swimming in a lake, walking in a wooded area, or getting infected water on your contact lenses. This type of infection is called *Acanthamoeba* keratitis.

Viruses: Viral keratitis is primarily caused by the herpes simplex virus, which progresses from conjunctivitis to keratitis

2.8. Measurement of Vision-Specific Health Related Quality of Life

Given a wide range of health problems or diseases, Health Related Quality of Life may be analyzed using either generic or disease specific instruments. Generic instruments aim to measure multiple aspects of Health Related Quality of Life; they can be applied to different populations and a range of different diseases, enabling comparison between different diseases or groups. However, generic Health Related Quality of Life measures may be not as sensitive to changes in vision-related function as vision-specific questionnaires would be (Margolis *et al*., 2001), because some Health Related Quality of Life issues specific to visual problems might not be adequately represented in a generic measure (Langelaan *et al.,* 2007). In contrast, vision-specific measures can be more responsive to changes in visual problems and functional status, so they are able to discriminate more finely between the levels of severity of patients' conditions. However, vision-specific instruments are incapable of comparisons between visual impairment and other conditions.

2.9. Factors Influencing Health Related Quality of Life

To improve or maintain Health Related Quality of Life for older people in general and visually impaired older adults in particular is an important goal of both health care and social care. As addressed before, many types of functional degeneration attributed to a decline in vision can be slowed or even reversed, subsequently improving the older adults' Health Related Quality of Life when visual acuity is improved. It has been confirmed that early detection and treatment of age-related ocular disorders can reduce the progression of the disease or the onset of vision loss, and prevent blindness (Harvey, 2003). Monitoring the progression of ocular diseases and long-term follow-ups are important for avoiding the development of long-term complications and deterioration of patients' visual function, thus promoting their Health Related Quality of Life (Chen *et al*., 2019). Therefore, accessible and affordable eye care is particular important for improving the Health Related Quality of Life of visually impaired older adults. Unfortunately, unaddressed visual problems are common among the general older population and nursing home population. A recent survey conducted in 70 countries indicated the rate of eye care utilization by older adults was 37% in high income countries and only 10% in low income countries (Lane *et al*., 2018).

Low-vision rehabilitation services, which mainly focus on various optical and non-optical devices and techniques to enhance residual vision or substitute for lost vision, is important in helping people regain their independence, take care of personal needs, and participate in work/leisure activities Studies have suggested that appropriate rehabilitation can significantly improve Health Related Quality of Life for visually impaired patients including those with glaucoma (Luo, 2011) and the oldest old. However, it has been suggested that the present system of low-vision care is less than optimal in many countries, and that only 10% - 15% of visually impaired people can access low-vision services (Chiang *et al.,* 2011). Thus, meeting the eye care needs of older people is still a major challenge for many countries. In such situations, it would be important to understand what factors beyond medical treatment and vision rehabilitation influence Health Related Quality of Life of visually impaired older adults, as it would be helpful for improving their Health Related Quality of Life.

2.9.1. Age

While one study suggested that age did not significantly affect global QOL (Kerr *et al.,* 2003), two studies suggested that age was independently associated with vision-specific QOL impairment. A study suggested that there was a significant interaction effect of vision status and age on life satisfaction and QOL (Lazon de La Jara *et al.,* 2011).

2.9.2. Gender

Vision loss is more frequently observed in women than in men. Although one study suggested that Health Related Quality of Life was worse in women than in men for all categories of impaired visual acuity (Esteban *et al.,* 2008), another study did not.

2.9.3. Socioeconomic Status

A very high rate of visual impairment is often observed in the low socioeconomic status population (Dandona and Dandona, 2001). It was reported that socioeconomic resources, measured as income and financial strain, played a role in explaining the effect of visual impairment on declines in people's HRQOL, and that increasing material deprivation was independently associated with reduced levels of vision-specific HRQOL.

2.9.4. Mobility

It was found that the ability to get around made a significant and unique contribution to the prediction of perceived HRQOL. Activity limitations played a role in explaining the effect of visual impairment on declines in HRQOL (Wang *et al*., 2014). Higher perceived activity levels appear to predict better HRQOL (Bize *et al*., 2007).

2.9.5. Comorbidity

Comorbidity is the presence of one or more additional disorders such as hearing impairment, asthma, arthritis, cancer or diabetes, in the presence of visual impairment. Co morbidity is common among older adults and is considered a major threat to HRQOL. One study indicated that the presence of co morbidity predicted a relatively rapid decline in the HRQOL of visually

impaired older patients (Nispen, 2009). Another study reported that the presence of co morbidities lead to significant impairments in both the physical and mental components of HRQOL (Sareen *et al*., 2006). While an earlier study reported that the number of associated systemic co morbidities did not significantly affect HRQOL (Fortin *et al*., 2004). However, the negative impact of visual impairments on HRQOL was not exacerbated by the co-occurrence of cognitive impairments (Vu *et al*., 2024).

2.9.6. Family Support

Due to functional disabilities, visually impaired older adults often need help from others especially family members. Previous studies have indicated that both emotional and instrumental support provided by family members be important to the HRQOL of older adults with visual impairment (Brown and Barrett, 2011). A recent study on marital quality of older adults suggests that relationship satisfaction and supportive spouse behaviors moderate the effects of poor vision on functional limitations and depressive symptoms (Bookwala, 2011).

2.9.7. Social Support

Many visually impaired older adults have reduced social networks due to their limited capacity to participate in social activities. Social support has emerged as one of the most important contributors to HRQOL for people with visual impairments (Haegele *et al.*, 2024). Researchers have reported that participation in social roles, social integration, and perceived support play roles in explaining the effect of visual impairment on declines in the HRQOL of older adults (Desrosiers *et al*., 2009).Severely visually impaired older adults may feel being isolated from society and experience decreases in social status. Decreased social status is independently associated with HRQOL impairments. Thus, support groups and peer counseling can be extremely helpful for older adults with visual impairments in coping with vision loss (Watson, 2001). Studies indicated that friendship networks, friendship support (Wang *et al.*, 2021) the reassurance of one's worth by friends and the enjoyment of companionship from friends (Tariq, 2011).Were significantly associated with better adaptation, psychological well-being and HRQOL, independent of family network and family support, in visually impaired older adults. A study further suggested that high qualitative friend support and high quantitative family support were significantly associated better adaptation to vision loss among older adults (Tariq, 2011).

2.9.8. Use of Eye Care Services

A cross-sectional study documented that only 16% of older persons with treatable visual impairments were under eye care at the time of study, and that a significant number of older adults had not undergone eye examination for more than 3 years (Cox, 2005). Thus, use of eye care service is an important factor that may influence visually impaired older adults' HRQOL. Studies have shown that older adults in contact with eye care services have more positive scores on general health perceptions, vitality/energy, and mental health after controlling for all other covariates (Tsai, 2004). A study also reported that use of a writing aid predicted better HRQOL.

2.10. Ophthalmic Examination

Ophthalmic examination of a patient with visual loss aims to confirm the impairment, establish the diagnosis, identify the treatment required and describe the prognosis for the disorder(s) causing visual loss. The examination by ophthalmic professionals is an important component of the broader assessment of visual function and educational needs of the child, who forms the basis of the plan of management of that child and his/her, family (Swaminathan *et al*., 2019). Identification of cases of visual impairment is carried out at eye clinics, school screening programmes, community-based rehabilitation (C.B.R) programme or special schools for the visually impaired. The single most important measurement in ocular examination is visual acuity. An accurate visual acuity can be performed using standard figures or opto types.

The Snellen's chart consists of letters or numbers in decreasing sizes according to the international standards. The notations on the Snellen's VA chart may be in meters or feet. To measure VA, the patient is positioned 6 meters (20feet) from the Snellen's chart. The patient reads the lines of the smallest numbers or letters which he/she can see clearly while closing one eye with the palm of his hand at a time. This is recorded with the distance number (6m) first, and the smallest figures read second, separated by slash (/) e.g. 6/18 or 20/60. Where vision is so poor that figures in the chart cannot be read at six meters, the chart is moved closer to the patient and the vision recorded for example, as 3/60. If the patient cannot see the figures on the chart at close range of half a meter, the examiner waves his hand before the patient's eye to determine if the patient can see hand movement and thus recorded HM. If the patient cannot see hand movement, then it is determined if focal light from a torch may be projected by each of the four

retinal quadrants and recorded as Perception of Light (PL) with accurate or inaccurate projection if projected in all four quadrants, or if projected in some or none respectively. If light from the torch cannot be seen, then VA is recorded as No Perception of Light (NPL). The interpretation for VA of 6/18 means that, a person standing at 6 meters from the chart is able to see what a normal person with normal sight should see at 18 meters (Kaiser, 2009).

3. Material and Method

3.1. Description of the Study Area

Debre Markos Urban Administration Woreda is one of the 21 Woredas in East Gojjam zone, Amhara Region of Ethiopia located in East Gojjam Zone, Amhara Region. The relative location of the woreda is 290km south west of Addis Ababa and 256km northeast from Bahar Dar, which is the capital city of Amhara Regional state.

This research was conducted in one selected hospital (Debre Markos referral hospital) of kebele five Debre Markos, in East Gojjam Amhara region Ethiopian. The boundary demarcation of the Study area is in East Gozamin Woreda, to North Snan Woreda, to southeast Gozamin Woreda and to west Gozamin Woreda to Northwest by Gozamin .The administrative center of this woreda is DebreMarkos, which is located 10° 17' 55" N Latitude to 10° 22' 15" N Latitude and 37° 41' 15" Longitude to 37° 46' 15" E longitude.

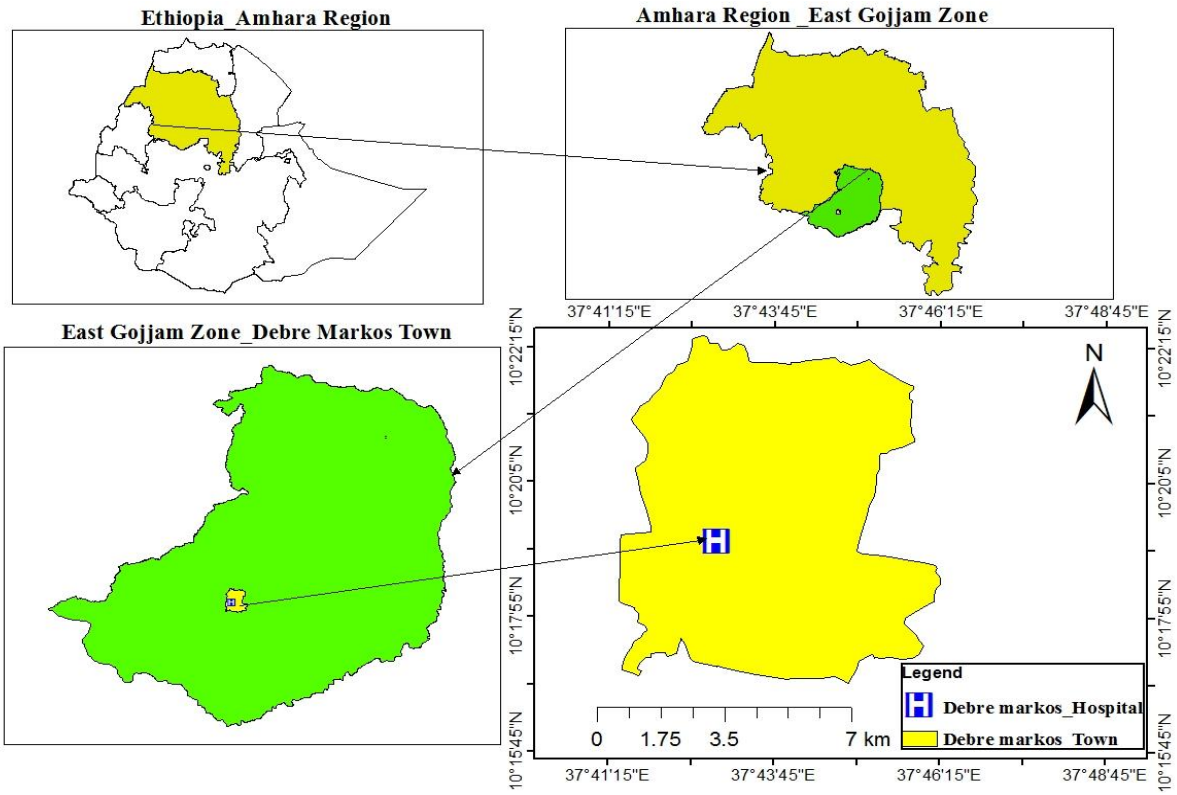

Figure 1 Map of Ethiopia showing Amhara region Debre Markos districts (adopted from GIS.A 2023)

3.2. Research design

This research was a retrospective study and age, gender-focused, where both male and female were considered in the study. The quantitative method was used to obtain, analyze, Interpret and tabulate the data in numerical form.

3.3. Study population

The total population of the study was all patients registered at ophthalmology ward in the hospital during the last five consecutive years from 2019-2023.

3.4. Sampling procedure

The researcher used document analyses which recorded to be a patient in the five consecutive years starting from 2019 up to 2023 in Debre Markos Referral Hospital. The research utilized secondary data collection methods to gather data/information for analysis.

3.5. Inclusion Criteria

The study includes all those who went to Debre Markose Referral Hospital, issued a card and underwent eye treatment.

3.6. Study variables

3.6.1. Dependent variables: - Eye disease, Visual Impairment

3.6.2. Independent variables: - Age, Gender

3.7 Data quality assurance

After taking the data from Debre Markos referral hospital and verifying that there is no wrong data, I went back to the hospital and the number of patients registered in 2022the total number of patients' cards, so I assumed that the data of other years was correct.

3.8 supported letter

In order to carry out this study, a supported letter from the Department of Zoological Science was submitted to the Debre Markos Referral Hospital Administrative Body and permissions letters was obtained from the Debre Markos Referral Hospital Administrative Office (Ref number 609/ 22.217/ 16). In addition to this, the local administrative bodies were informed regarding the objective and purpose of the study to encourage them to provide relevant data for this study.

3.9 Data analysis methods

The data collected from secondary sources was analyzed using an Exele program soft ware in the form of a descriptive statistical analysis method, which would include tables . The researcher also presents the data quantitatively by using percentages. The researcher could calculate the percentage of each data point by using the following formula:

Total $Persentage(\%) = \frac{\text{Rat}}{\text{Base}} \times 100\%$

Where: Base: the total number of registered patients

Rate: the number of patients registered for each disease (Including age and sex).

4. Result

4.1 General prevalence of eye disease and visual impairment with age categories

A total of 61,946 patient records were reviewed during the period of 2019–2023; more than half of the patients 35,810 (57.8%) were males and 26,136 (42.2%) were females. The number of patients that were recorded based on sex and age categories. Generally, the number of patients increases based on age, ranging from <1 year up to 64 years. But in >65 years, the increasing or decreasing number of patients depends on the type of disease that was recorded. 29,106(46.9%) of patients were between the age of 30-64years, from this 15,166(24.5%) were males and13, 940(22.5%) were females. fourteen thousand eight hundred twenty nine.(23.9%) of patients were between15-29 years, from this 8,368(13.5%) were male and 6,461(10.4%) were females, so male are also more victims than females;14191(22.9) of patients were age >65years, from this 9,835(15.87%) of patients were males and 4,356(7%) of patients were females, so males are also more victim than females; 2,744(4.4%) of patients were age between 5-14 years, from this 1,830 (2.95%) were males and 914(1.48%) of patients were females. six hundred seventy six (1.1%) of patients were age between1-4years from this 3,879(0.62%) of patients were males and 289 (0.47) patients were females. four hundred (0.64%) of patients were age <1 years from this 224 (0.36%) of patients were males and176 (0.28%) of patient were females. Generally Table 4.1 shows that males were more victims than females and when age level increases the total number of patient were also increases until when the age reach >65 years.

Table 2: Total Age distribution of patients from 2019-2023

Age	2019-2023					
	Male	%	Female	%	Total	%
<1years	224	0.36	176	0.28	400	0.64
1-4years	387	0.62	289	0.47	676	1.1
5-14years	1830	2.95	914	1.48	2744	4.4
15-29years	8368	13.5	6461	10.4	14829	23.9
30-64years	15166	24.5	13940	22.5	29106	46.9
>65years	9835	15.87	4356	7	14191	22.9
Total	35810	57.8	26136	42.2	61946	100

4.2 Annual prevalence of eye disease from 2019-2023

In total thirteen type of eye disease were registered in Debre Marekos Referral Hospital within five consecutive years, i.e. 2019-2023 and sixty nine thousand seven hundred sixty nine patients were registered within these thirteen types of eye disease. The prevalence of patients of each type of eye disease within each year as shown from the data high prevalence rate was reviewed with in the year 2019-2021.but in other years the prevalence rate was decreased.

Table 3 annual prevalence of eye disease from 2019-2023

Type of eye disease	2019	2020	2021	2022	2023	Total
Cataract	4274	4691	4317	589	2432	16302
Glaucoma	2471	2426	2487	559	623	8566
Conjunctivitis	2652	2589	2537	218	423	8419
Infectious blepheritis	593	589	724	150	493	2553
Presbyopia	4091	4138	3890	141	487	12747
Myopia	612	645	698	90	314	2359
Astigmatism	327	277	446	65	277	1392
Coronial scars	307	321	334	53	226	1241
Coronial ulcers	0	341	468	29	201	1039
Infectious keratitis	0	116	201	43	145	505
Keratoconjunctivitis sicca	0	153	101	52	124	430
Injury of the eye	0	2376	2681	0	46	5103
Trachoma	541	413	134	1	24	1113
Total	15868	19075	19018	1990	5815	61769

4.3 Cataracts

A total of 16,302 (26.3%) cataract infected patients were reviewed during the period of 2019-2023.More than half of the patients 9,718 (15.68%), were males and 6,584 (10.62%) were females. High prevalence of cataract disease can occur within the age range of 30 years and above. Females are more victims than males by cataracts disease among patients within the ages of 1 – 4years. Therefore, it could be said that cataract disease has a continuous relationship with age. However; the data shows that there is a possibility of developing cataract disease from birth.

Table 4: Age and Gender distribution of cataract patient from 2019-2023

Age	Males	(%)	Females	(%)	Total	(%)
< 1 years	9	0.06	16	0.08	25	0.15
1---4years	7	0.04	13	0.08	20	0.12
5—14years	145	0.9	84	0.5	229	1.4
15—29years	476	2.9	337	2.07	813	5
30---64years	3,673	22.5	3,385	20.8	7,058	43.3
>65years	5,408	33.2	2,749	16.7	8,117	49.8
Total	9,718	59.6	6,584	40.4	16302	100%

4.4 Glaucoma

A total of 8,566 (13.8%) Glaucoma infected patients were recorded during the period of 2019–2023 at Debre Markos referral hospital. More than half of the patient 6,020 (9.71%), were male and 2,546 (4.11%), were female. females are more infected by glaucoma within the age of1-4years and15-29 years. Also, glaucoma is more common in people over the age of 30 and, In general, it could be said that glaucoma was an age-related disease. Glaucoma also occur with the age of<1 years.

Table 5: Age and Gender distribution of Glaucoma patient from2019- 2023

Age	Males	%	Females	%	Total	%
<1years	9	0.1	8	0.09	17	0.19
1-4years	0	0	2	0.02	2	0.02
5-14years	38	0.4	7	0.08	45	0.5
15-29years	112	1.3	139	1.6	251	2.9
30-64years	3,327	38.8	1,778	20.7	5,105	59.6
>65years	2,534	29.6	612	7.1	3,146	36.7
Total	6,020	70.3	2,546	29.7	8,566	100

4.5 Conjunctivitis

A total of 8,419 (13.6%) conjunctivitis infected patient were recorded starting from a period of 2019–2023. More than half of the patient 4,913 (7.93%), were males and 3,506 (5.65%) were females. We have seen from the data that there is a high prevalence of conjunctivitis among people aged 15- 64. The prevalence of conjunctivitis decreases with the age of >65 years. But it could be understood from the data that the disease is also highly prevalent in children.

Table 6: Age and Gender distribution of Conjunctivitis patient from 2019-2023

Age	Males	%	Females	%	Total	%
< 1 years	192	2.28	138	1.6	330	3.9
1---4years	261	3.1	206	2.4	467	5.5
5—14years	586	6.96	408	4.8	994	11.8
15—29years	1,935	22.9	1,367	16.2	3,302	39
30---64years	1,642	19.5	1,235	14.7	2,877	34.2
>65years	297	3.5	152	1.8	449	5.3
Total	4,913	58.4	3,506	41.6	8,419	100

4.6 Infectious blepheritis

A total of 2,553 (4.12%) infectious blepharitis infected patient were recorded with in a period of 2019-2023. More than of half of the patient 1,442(2.33%), were males and 1,111(1.8%) were females. as shown from the data the prevalence of infectious blepharitis disease increase when the age of the patient increase in both sex, until the age is rich in >65 years.

Table 7: Age and Gender distribution of infectious blepharitis patient from 2019-2023

Age	Males	%	Females	%	Total	%
< 1 years	5	0.2	5	0.2	10	0.4
1---4years	11	0.4	20	0.8	31	1.2
5—14years	42	1.6	28	1.1	70	2.7
15—29years	355	13.9	251	9.8	606	23.7
30---64years	713	27.9	620	24.3	1333	52
>65years	316	12.4	187	7.3	503	19.7
Total	1442	56.5	1,111	43.5	2553	100

4.7 Presbyopia

A total of 12,747 (20.6%) Presbyopia infected patients were recorded within the period of 2019–2023. More than half of the patient 7,518 (12.13%) were females, and 5,229 (8.44%) were males. Males are more victims than females, with ages ranging from 1-14 years and older than 65 years. In addition to this, it indicates that the disease of Presbyopia does not exist under the age of one year, and also the data shown that people who live between the ages of 15- 64 have a higher prevalence rate than other.

Table 8: Age and Gender distribution of Presbyopia patient from 2019-2023

Age	Males	%	Females	%	Total	%
< 1 years	0	0	0	0	0	0
1---4years	20	0.15	2	0.02	22	0.17
5—14years	522	4.1	46	0.36	568	4.5
15—29years	2190	17.2	2593	20.3	4783	37.5
30---64years	2196	17.2	4612	36.2	6808	53.4
>65years	301	2.36	265	2.07	566	4.4
Total	5,229	41	7,518	58.9	12,747	100

4.8 Myopia

A total of 2359 (3.8%) myopia infected patients were recorded from the years 2019–2023 in the Debre Markos referral hospital. More than half of the patient1396 (2.25%) were male and 963 (1.6%) were females. Myopia does not take place within the age range of <4 years, and within the age range of 5-14 females were more victim than males.high prevalence of myopia occurs within the age of between15-64 years.

Table 9: Age and Gender distribution of myopia patients from 2019-2023

Age	Males	%	Females	%	Total	%
< 1 years	0	0	0	0	0	0
1---4years	0	0	0	0	0	0
5—14years	97	4.11	118	5	215	9.1
15—29years	573	24.3	464	19.7	1037	43.9
30---64years	560	23.7	331	14	891	37.7
>65years	166	7	50	2.11	216	9.2
Total	1,396	59.2	963	40.8	2,359	100

4.9 Astigmatism

A total of 1392 (2.25%) Astigmatism infected patients were registered from the years 2019 - 2023 in the Debre Markos referral hospital. More than half of the patients 856 (1.4%), were male, and 536 (0.86%) were female. female patients were more infected between the age 5-14years.The data although show that there are no patients that are recorded between within the age range from <1 up to 4 years. In addition to this, more patients were observed above the age of 15-64years.

Table 10: Age and gender distribution of Astigmatism patient from 2019-2023

Age	Males	%	Females	%	Total	%
< 1 years	0	0	0	0	0	0
1---4years	0	0	0	0	0	0
5—14years	31	2.2	44	3.2	75	5.4

15—29years	256	18.4	231	16.6	487	34.9
30---64years	389	27.9	225	16.2	614	44
>65years	180	12.9	36	2.6	216	15.5
Total	856	61.5	536	38.5	1392	100

4.9 Corneal Scars

The cornea is resilient and can typically heal from minor abrasions. However, major corneal damage can result in a corneal scar. A total of 1,241(2%) corneal scars or opacities infected patient were recorded from the years 2019-2023.More than half of patient 795(1.3%), were male and 446 (0.72%), were females. Male patients were more victim than female patients in all age categories.

Table 11 Age and Gender distribution of corneal scars or opacities from2019-2023

Age	Males	%	Females	%	Total	%
< 1 years	4	0.3	0	0	4	0.3
1---4years	16	1.3	13	1.04	29	2.3
5—14years	49	3.9	40	3.2	89	7.2
15—29years	186	14.9	128	10.3	314	35.3
30---64years	319	25.7	201	16.2	520	41.9
>65years	221	17.8	64	5.2	285	22.9
Total	795	64	446	35.9	1,241	100

4.10 Corneal Ulcers

A corneal ulcer is a wound-like sore on the cornea, the clear, dome-shaped tissue layer at the front of your eye. A total of 1,039 (1.7%) coronial ulcer infected patients were registered from 2019-2023 in Debre Markos Referral Hospital. More than half of patients 691 (1.1%), were males and 348 (0.56%), were females. Males were more infected than females within the age of <1years and above. More prevalence rates occur within the age of15 years-64 years.

Table 12: Age and Gender distribution of corneal ulcer patient from 2019-2023

Age	Males	(%)	Females	(%)	Total	%
< 1 years	4	0.4	3	0.3	7	0.7
1---4years	22	2.1	16	1.5	38	3.7
5—14years	76	7.3	34	3.3	110	10.6
15—29years	242	23.3	102	9.8	344	33
30---64years	283	27	174	16.7	457	44
>65years	64	6.2	19	1.8	83	8
Total	691	66.5	348	33.5	1039	100

4.11 Infectious keratitis

A total of 505 (0.81%) infectious keratitis infected patients were registered in Debre Markos referral hospital from 2019 - 2023. More than half of the patients 306 (0.49%), were males and 199 (0.32%), were females. Males were more infected than females within the age range of 1 year and above. People who were lives within the age of 15-64years have higher prevalence rate than other age.

Table 13: Age and Gender distribution of infectious keratitis from 2019-2023

Age	Males	%	Females	%	Total	%
< 1 years	0	0	2	0.4	2	0.4
1---4years	12	2.4	5	1	17	3.4
5—14years	37	7.3	25	4.9	62	12.3
15—29years	98	19.4	86	17	184	36.4
30---64years	137	27	74	14.7	211	41.8
>65years	22	4.4	7	1.4	29	5.7
Total	306	60.6	199	39.4	505	100

4.12 Keratoconjunctivitis sicca

A total of 430 (0.69%) Keratoconjunctivitis sicca infected patients were registered with in the years 2019-2023. More than half of patients 291 (0.5%),were males. and 139 (0.2%),were

females. there is no infected person were observed in both sex under the age of one and also male are more infected than females within the age of 1years and above.

Table 14: Age and Gender distribution of Keratoconjunctivitis sicca from 2019-2023

Age	Males	(%)	Females	%	Total	%
< 1 years	0	0	0	0	0	0
1---4years	5	1.2	6	1.4	11	2.6
5—14years	77	17.9	19	4.4	96	22.3
15—29years	125	29	54	12.6	179	41.6
30---64years	68	15.8	49	11.4	117	27
>65years	16	3.7	11	2.6	27	6.3
Total	291	67.67	139	32.3	430	100

4.13 injury of the eye

A total of 5103 injuries of the eye and orbit infected patients were recorded from the years 2019 - 2023. More than half of the patients 3,698 (72.5%) were male, and 1,405 (27.5%) were females. High prevalence rat of infected person were observed within the age of 15-64.females are more victims than male under the age of one.

Table 15: Age and gender distribution of injury of the eye and orbit patient from2019-2023

Age	Males	%	Females	%	Total	%
< 1 years	1	0.02	4	0.08	5	0.1
1---4years	30	0.58	4	0.08	34	0.7
5—14years	116	2.3	50	0.97	166	3.3
15—29years	1749	34.3	590	11.6	2339	45.8
30---64years	1640	32.1	698	13.7	2,338	45.8
>65years	162	3.2	59	1.2	221	4.3
Total	3,698	72.5	1405	27.5	5103	100

4.15 Trachoma

A total of 1113 (1.8%) trachoma infected patient were recorded from 2019 -2023. Half of the patient 752 (1.21) were females and 361 (0.58%) were male. Females were more infected with in the age of15 years and above than male. And both male and females were equally infected in the age of<1years and 5-14years.

Table 16: Age and Gender distribution of trachoma patient from 2019-2023

Age	Males	%	Females	%	Total	%
< 1 years	0	0	0	0	0	0
1---4years	2	0.2	1	0.09	3	0.3
5—14years	7	0.6	7	0.6	14	1.3
15—29years	54	4.9	100	9	154	13.8
30---64years	180	16.2	513	46.1	693	62.3
>65years	118	10.6	131	11.8	249	22.4
Total	361	32.4	752	67.56	1,113	100

4.16 Prevalence of different type of eye disease

The prevalence of different eye diseases was shown in Table 16; some of the patients had more than one eye disease. Hence, the total number in the table would be greater than the number of patients examined. Cataract, (16302, 26.4%), was the most common eye disease seen in our study followed by Presbyopia (12747, 20.63%). Among the 16302 cataract patients 9718 (15.7%) were male and 6584 (10.7%) were female. Among the Presbyopia 12747 (20.63%) patients 5229 (8.5%) were male and 7518 (12.2%) were female. The other common eye disease in this study area was glaucoma 8566 (13.9%) patients 6020 (9.7%), were male, and 2546 (4.1%) were female. For conjunctivitis, of the 8419 (13.6%) patients, 4943 (8.8%) were male and 3506 (5.7%). were female generally, cataract (26.4), Presbyopia (20.63%), glaucoma (13.9%), and conjunctivitis (13.6%) were the major leading cause of eye disease and visual impairment respectively.

Table 17: The prevalence of different type of eye disease recorded from 2019 up to 2023

Eye Diseases	Males	%	Female	%	Total	%
Cataract	9,718	15.7	6,584	10.7	16302	26.4
Glaucoma	6020	9.7	2546	4.1	8566	13.9
Conjunctivitis	4913	8	3506	5.7	8419	13.6
Infectious blepheritis	1442	2.3	1111	1.8	2553	4.1
Presbyopia	5229	8.5	7518	12.2	12747	20.63
Myopia	1396	2.26	963	1.6	2359	3.8
Astigmatism	856	1.4	536	0.9	1392	2.3
Coronial scars or opacities	795	1.3	446	0.7	1241	2
Coronial ulcers	691	1.1	348	0.6	1039	1.7
Infectious keratitis	306	0.5	199	0.3	505	0.8
Keratoconjunctivitis sicca	291	0.47	139	0.2	430	0.7
Injury of the eye	3698	6	1405	2.3	5103	8.3
Trachoma	361	0.6	752	1.2	1113	1.8
Visual impairment	15	0.02	10	0.02	25	0.04
Binocular blind	**10**	**0.02**	**10**	**0.02**	**20**	**0.03**
Monocular blind	**69**	**0.1**	**63**	**0.1**	**132**	**0.2**
Total	**35,810**	**57.8**	**26,136**	**42.2**	**61,946**	**100**

4.17 prevalence of visual impairment and blindness

In Debre Markos Referral Hospital, in three consecutive years, i.e. (2019-2021), due to lack of recorded data, I have taken the data of visually impaired and blind people from the year when the data was recorded until I took the data, i.e. (2022-2023).the prevalence of visual impaired and blindness patient were calculated from the total number of patients that was recorded with in this two years (2022-2023). The total number of patient that was registered within this two year (2022-2023) was seven thousand nine hundred eighty two from this one hundred seventy seven of patients were visually impaired and blind. A total of 7,982 patients were records in the hospital and from this 25(0.3%) were visual impaired patients, from this, 15 of them were males

and 10 patients were females.132 (1.7%) of patients were monocular blind from this, 69 patients were males and 63 of patients were females. In addition to this 20 (0.25%) of patients were binocular victims.

Table 18 the prevalence of visual impairment and blindness from 2022-2023

Age	Visually impaired				Blindness monocular				Blindness binocular			
	Males	Females	total	%	Males	Females	Total	%	Males	Females	Total	%
<1years	0	0	0		0	0	0		0	0	0	0
1-4years	0	1	1	0.01	1	0	1	0.01	0	0	0	0
5-14years	3	1	4	0.05	4	2	6	0.1	0	1	1	0.01
15-29years	8	4	12	0.2	8	13	21	0.3	1	2	3	0.04
30-64years	3	3	6	0.08	33	37	70	0.9	3	5	8	0.1
>65years	1	1	2	0.03	23	11	34	0.4	6	2	8	0.1
Total	15	10	25	0.3	69	63	132	1.7	10	10	20	0.3

5. Discussion

In this study cataract 26.4% presbyopia 20.63%, glucoma 13.9% and conjunctivitis (13.6%) were the main leading cause of eye disease. And also the prevalence of blindness and visual impairment among patients who attended Debre Markos referral hospitals from 2022 up to 2023 was 0.3%, 1.7%, and 0.25 percent of visually impaired, monocular blindness, and binocular blindness respectively.

The prevalence of visual impairment in our study was similar to that reported in Horse and, whose study was based over < 1years period (Malalana *et al,.* 2019). Even though their study was based in a teaching hospital and our study was based in an eye hospital, the number of patients seen is nearly same compared to the time period of study.

Cataract prevalence among the rural population of Pahang (23%) was only slightly higher compared to a rural district in Sepang (20.1%) (Thevi *et al.,* 2012). Inthis study high prevalence of the same disease registered in Debre Markos referral hospital. In our retrospective study, the prevalence of cataract was 26.4%.

The prevalence of visual impairment of this finding (0.3%) was lower than in study conducted in Debre Birhan (16.8%) (Assefa *et al*., 2010), Gondar, Ethiopia (15.3%) (Woretaw and Shiferaw, 2015), in Arba Minch 36.95% (Tamiru *et al.*, 2024) This discrepancy might be due to age difference, sample size and type of data.

The prevalence of cataract 20.66%, trauma or injury of the eye 1.653%, and trachoma 6.6% (Tamiru *et al.,* 2024*).* were registered in the Arba Minch district, but a high prevalence of cataract 26.4% and injury of the eye or trauma 8.6% were registered in the study area, but a lower trachoma 1.8% prevalence was observed. This difference may be due to the type of data sampling technique and sampling size..

Glaucoma is the second cause of blindness worldwide (Pascolini, 2010) and some developed countries such as Japan and Germany have reported glaucoma as the second cause of VI (Finger

*et al.,*2011). according to our study Glaucoma was recognized as the third leading cause of eye disease in Debre Markos referral hospital.

In the Mediterranean region, trachoma is the second-leading cause of blindness (Tabbara, 2001). In certain African nations, trachoma is nearly as common as cataracts and is regarded as the primary cause of blindness (Ngodi *et al.,* 2006). According to this study, trachoma was one of the diseases that were declining, and the primary reason for this may be the effort of doctors in every Tena kela, along with the Keble leadership. This effort facilitates to create awareness about trachoma and provide a cure to the overall community.

In this study, the prevalence of visual impairment among patients registered between 2022 up to 2023 was 0.3%. This result is lower than institutional-based studies conducted in Addis Ababa, Ethiopia 17.6% (Cherinet, 2018), Ghana 31.9 % (Ansah, 2017), South Africa 28.0 % (Maake and oduntan, 2015), Debre Berhan town, Ethiopia 16.8% (Assefa *et al.,* 2020), Gurage Zone, Ethiopia 20 % (Melese,2003), Ghana 22.7%, (Boadi-Kusi *et al*.,2017), and Yugan county, China 19.2 % (Gana *et al.,* 2018). This difference might be due to variation in the study setting, sampling size, and eye care service-seeking behaviors of the participants. In addition, availability and accessibility of eye care services could also contribute to this difference.

Regarding blindness, this study showed that the prevalence of the sum of both monocular and binocular blindness was 2%. This result is nearly similar with other studies done, Nepal 1.94% (Thapa *et al.*, 2018), Sri-Lanka1.7 % (Abeysena and Champa, 2018) and Yugan county, China 2.27 % (Gana *et al.*, 2018) In contrast, this finding is lower than the studies conducted in University of Gondar Tertiary eye care, Ethiopia14.3 % (Tegegn, 2021), Addis Ababa, Ethiopia 7.3% (Cherinet, 2018), Gurage Zone, Ethiopia7.9 % (Melese, 2003), Ghana 5.3 % (Boadi-Kusi, 2017), Sudan 14 % (Ibrahim and Elnimeiri, 2020), and South Africa10.9 % (Maake, 2015) and Afghanistan 8.7 % (Abdianwall and Doğan, 2020). The difference observed here might be due to the difference in study locations, sampling size, eye care service-seeking behaviours, access to eye care service, and study population characteristics.

6. Conclusion

Based on the result, we can clearly conclude that there was an increasing rate in the numbers of infected people by cataract. Even if it was decreasing according to an increase years, glaucoma becomes most sensitive in the age range of 15 to 64, and the same was true in the case of conjunctivitis. Infectious blepharitis, Presbyopia, and myopia also had a decreasing rate when the year increases but all shows high records in both sex and productive age level, which was between 15 and 64 years. In case of astigmatism records high in productive stage and males were highly affected than females.

On the other hand in case of Corneal scars/opacities, corneal ulcer, patients number increase when the years increase in ascending order. In addition to this number of records also vary and high in case of males than females mostly in the year between 15 up to 64 years.

In the case of infectious keratitis and keratoconjuctivities, there was a fluctuation of records and a little bit of minimization observed. But it was also high in the age range of 15 to 64, and significantly males were highly infected. On the contrary, injury to the eye, orbit, and trachoma records show a highly decreasing rate, but in the case of injury to the eye or orbit, males were highly recorded, as in the case of trachoma, females were highly infected.

Our findings indicated that high prevalence of eye disease in children was due to conjunctivitis, but in adults it was due to cataracts, presbyopia, and glaucoma. The prevalence of visual impairment can be greatly reduced by providing health education and awareness on eye care in primary health care centers and through regular visits to ophthalmologists and optometrists.

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