Effect of trachoma on blindness in Hargeisa city

A Research paper Submitted to the faculty of science and technology

At University Of Hargeisa

In partial fulfillment for the requirements of Bachelor degree of Nutrition and food science

By: A/rahman Osman Jama, August, 2014
Effect of trachoma on blindness in Hargeisa city
Effect of trachoma on blindness in Hargeisa city

Declaration

1, A/rahman Osman Jama hereby declare that this thesis is my original work and has been presenting for the award of a Bachelor degree in Nutrition at the faculty of nutrition and food science at University of Hargeisa in the year of 2014.

Signature: _______________ Date: _______________

This research thesis has been submitted with our approval as a supervisor

Dr Khadar Ahmed Omer

Advisor of this research book/paper

Faculty of science and technology at university of Hargeisa

Signature: _______________ Date: _______________
Dedication

I dedicate this work to my parents and all other members who participate and encouraged me to do my best.
Acknowledgement

Fist praise is due to Allah who gave me the ability and strength to finalize my thesis book with realistic objectives on it. Secondly I would like to express my feelings to family especially my respectable, remarkable, cousin Ali Abby Jama who I really appreciate and wish many happy returns to him how truthfully he helped morally and materially to my educational carrier for the past sixteen years and so on opening from my child hood up to day, I can’t mention pages and books how much I would like to thank him.

As it is here, I would like to thank here my dear friends who are very professional, creative, and cooperate together and often motivates them to arrange their accomplishment including my dear friend Harir Mohamed Role. indeed this page alone will not do enough to mention names, but generally it like to thank how honorable they helped me during my writing Thesis book it also here to thank my dear lecturer and in my supervisor Dr. Khaddar Ahmed Omar my thanks to the knowledge of the value would not inherited during my teacher as well as the integrity of my commitment to help me out during my Thesis writing any book of abilities.

Finally, I would also like to thank the respondents whose ideas and knowledge made it easier for me to complete this book which independently, without me possibly imposes.
Table of contents

Title page: .................................................................i
Declaration: .............................................................ii
Dedication: ...............................................................iii
Acknowledgement: ..................................................iv

Chapter one:- Introduction

1.0 Background of the study.................................1
1.1 Statement of the problem..............................5
1.2 General objectives.........................................5
1.3 Specific objectives.........................................5
1.4 Research questions........................................5
1.5 Scope of the research....................................5
1.6 Significant of the study.................................6
1.7 Definition of operational terms........................6

Chapter two:- Literature review

2.0 Concepts, opinions, and ideas from Authors/ experts......7
2.1 theoretical perspectives- definitions childhood blindness......8
2.1.1 Prevalence of childhood blindness.......................8
2.12 Avoidable cause’s childhood blindness......................9
Chapter three: - Research methodology

3.0 Introduction-----------------------------------26
3.1 Research design-----------------------------------26
3.2 Advantages of correlation------------------------26
3.3 Research population-------------------------------26
3.4 Target population--------------------------------27
3.5 Sample size--------------------------------------27
3.6 Sampling procedure------------------------------27
3.7 Research instrument-------------------------------28
3.8 Validity and reliability--------------------------28
3.9 Data analysis------------------------------------29
3.10 Ethical consideration-----------------------------29
3.11 limitations of the study-------------------------29

Chapter four:- ANALYSIS, PRESENTATION, AND INTERPRETATION

4.0 Analysis, Presentation, and Interpretation---------30
4.1 Analysis and presentation-------------------------30

Chapter five: - Conclusion and recommendation

5.0 conclusion and recommendation--------------------45
5.1 discussion and conclusion------------------------45
5.2 Recommendations---------------------------------45

Appendices

Appendix A reference---------------------------------47
Appendix B sample of the questionnaire used----------48
Chapter one: - Introduction

1.8 Background of the study
1.9 Statement of the problem
1.10 General objectives
1.11 Specific objectives
1.12 Research questions
1.13 Scope of the research
1.14 Significant of the study
1.15 Definition of operational terms
Chapter One

1.0 Background

Trachoma is the second leading cause of blindness worldwide continues to be hyper endemic in many areas of Africa, Asia, and the Middle East. Caused by an ocular infection with *Chlamydia trachoma*. This chronic conjunctivitis results in more blindness than any other infectious eye disease. Once endemic in most countries, trachoma has largely disappeared from Europe and the Americas. Because of its disappearance from developed countries and its endemi city in the poorest of communities, trachoma has been largely forgotten as a public health issue. Communities with trachoma are often those with the fewest resources to take on health issues and trachoma strikes the most vulnerable members of those communities: women and children are the only ones to cataract as the leading cause of blindness, trachoma affects an estimated 300-500 million people of whom 5-7 million are blind. In the last 10 years there have been considerable advances in our understanding of the epidemiology and approaches to trachoma control that have major ramifications for public health measures against this disease. In this review we summarize the characteristics of trachoma, the epidemiology and risk factors for the disease, and promising approaches to control strategies. The strides made in research on trachoma clearly warrant a reprioritization of this forgotten disease.

Trachoma is caused by *C. trachoma*. It is an obligate intracellular organism that has no free living state. There is no known animal reservoir for human Chlamydia infection. The Chlamydia is given a place in their own order, the three species of *C. trachoma* are *Chlamydia psittaci*, and *Chlamydia pneumonia*, can be further separated into several serovars. Within *C. trachoma* is the primary serovars
Effect of trachoma on blindness in Hargeisa city

responsible for trachoma are A, B, Ba, and C. The serovars D-K are associated with genital infections, and are the lymphogranuloma venereum serovars.

Historically, Civilizations have been afflicted with trachoma since ancient time. In Egypt, the features of trachoma were described in the Ebers Papyrus, a collection of writings by ancient Egyptian physicians epilation devices used for removing in turned eyelashes were present in Egyptian tombs as early as the nineteenth century B.C. Trachoma is a derivation of the Greek word for "rough," or "swelling" and ancient Greek physicians, including Hippocrates, wrote descriptions of treating trachoma and the chronic sequelae of infection In the early 1800s, Egypt became a military battle ground for England, France, and Turkey; and trachoma quickly spread to Europe. Much of the blindness attributed to trachoma was probably gonococcus conjunctivitis, but simultaneous infection with trachoma was likely Public health strategies to control the spread of infection were described in the early 1900s In 1920, Elliot recommended trying to control the fly population and avoiding hand/eye contact as mechanisms to decrease transmission.

According to the prevalence trachoma has largely disappeared from most of the Western world but it continues to be a major cause of blindness in the developing countries. Trachoma is still prevalent in large regions of Africa, the Middle East, Southwestern Asia, the Indian Subcontinent, and Aboriginal communities in Australia. In addition, there are small foci of blinding disease in Central and South America. Within these countries trachoma is more common in the particularly underdeveloped areas where good water supplies and basic sanitation services are lacking Even within hyper endemic areas trachoma clusters both at the neighborhood and at the household level. Trachoma is an infectious disease and transmission can occur by sharing clothes, towels, or sleeping quarters. Therefore trachoma is passed among family members and in some settings between families in households that are in close proximity. The variation in trachoma prevalence
Effect of trachoma on blindness in Hargeisa city

between neighborhoods in the same village can be several-fold. Crowded living conditions in the family unit appear to increase the risk of trachoma. With increasing numbers of persons per sleeping area the prevalence of active trachoma has been shown to increase. The association is logical as there is more exposure to infection or disease via close contact. A large family per se is not necessarily a risk factor for active trachoma in children. Rather the risk appears to be related to the likelihood of contact with an infected individual and larger families are more likely to have preschool children who have the highest prevalence of infection. Thus, several studies have found that mothers of children with trachoma are more likely themselves to have active disease, compared with women who either did not take care of children or whose children did not have trachoma. In studies of maternal genital infection as a source of trachoma found no evidence that maternal or perinatal transmission of *C. trachoma* was an important determinant of infection or disease in children. The stability and endemicity of the disease in the community largely determines the age distribution of the individual signs of trachoma. In hyper endemic areas active disease is most common in preschool children, with prevalence’s as high as 60-90 percent. The prevalence of active trachoma decreases with increasing age, with less than 5 percent of the adults showing signs of active disease. In areas where trachoma has been endemic for a long period of time conjunctiva scarring increases with age and is as high as 90 percent in some areas. Although rates of active disease are roughly similar in male and female children the later sequelae of trichiasis and entropies and corneal opacities due to trachoma are more common in women than in men in one location in Egypt, 75 percent of the women and 50 percent of the men older than 45 years had trichiasis or entropies. A typical pattern of the age and sex distribution of active and chronic trachoma for a hyper endemic area can be illustrated by figure 1. In areas where active trachoma has largely disappeared a different pattern of the presentation of trachoma is observed. The prevalence’s of lid scarring and chronic sequelae are more common
Effect of trachoma on blindness in Hargeisa city

than active disease and trachoma is present only in adults. The prevalence of trichiasis and corneal opacities due to trachoma in adults reflects past episodes of disease when this cohort was children. While the blinding complications may continue to be a problem for generations previously exposed the low or absent incidence of active disease in children is a good indicator of the future absence of blinding disease. In areas in which trachoma is not a blinding condition the prevalence of active disease in preschool children is less than 30 percent and the average age of peak prevalence is greater than in hyper endemic areas.

According to the World Health Organization worldwide there are an estimated 45 million people that are blind with an additional 135 million individuals visually impaired globally it is known that cataract is the leading cause of blindness with some 16–20 million people suffering from blinding cataract. India is the country with the highest number of blind people having more than 9 million people blind with the most prevalent cause of blindness and low vision being un operated cataract as indicated by several population based studies over the past two decades 4–7 In the neighboring region blindness prevalence surveys have been conducted in Nepal nationally and in one region of Pakistan that yielded all age blindness prevalence rates of 0.8% and 1.0% respectively. And another subsequent survey in two administrative regions of Nepal identified a blindness prevalence of 3.0% in people 45 years and older. Before this present study no nationwide study had been conducted in Bangladesh a country of over 130 million inhabitants concerning the extent of blindness or the main causes of vision impairment. This lack of vital information is particularly serious given the strategies identified in the WHO Global Initiative for the Elimination of Avoidable Blindness by 2020. The absence of reliable population based epidemiological data on blindness and low vision in Bangladesh is a serious impediment to the effective national planning of eye care programmers In order to redress the lack of blindness and low vision data among adults for this
Effect of trachoma on blindness in Hargeisa city

populous country, a nationwide survey was designed. The purpose of this study is to estimate the degree of blindness caused by trachoma.

1.1 Problem statement
As mentioned in the background Trachoma is the leading cause of infectious blindness worldwide and it is more serious in developing countries so this study will focus on the relationship between trachoma and blindness in Hargeisa, Somaliland so as to make the possible intervention.

1.2 General Objectives
The purpose of this study is to find out outcomes of trachoma against blindness in Somaliland especially in Hargeisa city.

1.2.1 Specific Objectives
1. To identify the most common causes of blindness in Hargeisa city
2. To determine the level of trachoma on blindness in Hargeisa city
3. Apply different preventive and control measures of blindness caused by trachoma

1.3 Research questions
1. How to determine the level of blindness caused by trachoma in Hargeisa city
2. How realize people how to decrease the number of blindness caused by trachoma
3. What are the common causes of blindness in Hargeisa city

1.4 Scope of the research
Geographical scope: - this research was done in Hargeisa specially menhal specially hospital, Sayid omer eye clinic, Gargaar hospital, and also Dr Gas ophthalmology hospital.

Time scope: - The time scope of this research from April to June 2014.
1.5- **Significant of the study**

Effect of trachoma on blindness is health and social effect in our society so there is need to carry out this research to find out the outcomes of trachoma in blindness.

This research is important for the policy makers in health care services, governmental and Nongovernmental organizations working with this sector to base on their resource allocation for health problems especially in Hargeisa which the area this research was carried out it is also good source for the future students who are carrying this research or any other related topic

1.6 **Definitions of operational terms**

1. **Hyper endemic**: is a disease that is constantly present at a high incidence and prevalence rate and affects all age groups equally.

2. **Ocular infection**: Managing the inflamed or infected eye in the emergency setting presents a diagnostic and therapeutic challenge to the emergency physician

3. **Chlamydia infection**: is referred to eyes infection caused by any species belonging to the bacterial family *Chlamydiaceae*. *C. trachomatis* is found only in humans. Chlamydia is a major infectious cause of human genital and eye disease.

4. **Conjunctivitis**: means the inflammation of conjunctiva of one or both eyes characterized by redness, swelling, pain, itching and discharge.

5. **Scarring**: is said to be a permanent change in person's character resulting from emotional distress ex. His wife's death left its scars on skin or a mark on plant indicating the former point of attachment of a part of the plant especially the attachment of a leaf or stem.
Chapter Two: - literature Review

Concepts, Ideas and definitions from Authors

2.0 concepts, Opinions, and ideas from authors /experts

2.1 theoretical perspectives, definitions of childhood blindness

2.2 other related studies
Chapter Two: - Literature review

2.0 Concepts, opinions, and ideas from Authors/ experts

Blindness is a no win situation of all term for a variety of significant problems with vision. Vision itself is a no win situation of all term for the activities our complex visual system performs including the abilities to recognize detail (acuity) color and contrast and the ability to recognize objects. There are many things that can go wrong with parts of this system each causing low vision or blindness in different ways. Many people classified as blind still have some Residual Vision but usually not enough to identify objects without support. Some may have lost central vision, but still have peripheral vision. Others may see light and dark or have difficulty with contrast or focusing. Still others may have no vision at all.

There is a definition for legal blindness but it is not very useful for describing what a person can or cannot do. The legal definition is having central visual acuity(ability to see detail) less than 20/200 even with the best correction (glasses or something similar) or losing so much peripheral vision that the person can only see in the central 20% of the visual field. This definition is rather vague and is not the only “official” definition of blindness - different agencies and states may use their own definition. The definition for low vision is similarly vague about functional ability visual acuity of less than 20/70 with the best correction and which interferes With activities of daily living. As with all disabilities the best way to find out what a particular person can or cannot do/see is to ask them.

Different eye conditions create different problems. Very few blind people see nothing at all; a minority can distinguish light from dark but nothing else; the majority possesses varying degrees of useful vision. Some have no central vision; others have no side vision. Some see everything as a vague blur others see a
patchwork of blank and defined areas. Some see best in sunlight, others prefer twilight. All this means that no two blind people see the world in the same way, so some blind people can see enough to read this encyclopedia, though they might have difficulty crossing the road.

2.1 Childhood blindness

The childhood blindness in children is considered a high priority within the World Health Organization’s (WHO’s) VISION 2020 the Right to Sight programme. There are several reasons for this. Firstly, children who are born blind or who become blind and survive have a lifetime of blindness ahead of them with all the associated emotional, social, and economic costs to the child, the family, and society. Indeed, the number of “blind years” due to all causes of blindness in children is almost equal to the number of “blind years” due to cataract in adults. Secondly, many of the causes of blindness in children are either preventable or treatable. Thirdly, many of the conditions associated with blindness in children are also causes of child mortality (e.g. premature birth, measles, congenital rubella syndrome, vitamin A deficiency, and meningitis). Control of blindness in children is therefore closely associated to child survival. Reducing visual loss in children poses particular challenges which are different from the challenges of controlling adult blindness. Children are born with an immature visual system and, for normal visual development to occur, they need clear, focused images to be transmitted to the higher visual centers. Failure of normal visual maturation (amblyopia) cannot be corrected in adult life, so there is a level of urgency about treating childhood eye disease which does not necessarily apply to adult conditions. The assessment of vision and examination of the eyes also pose particular difficulties, which require time and experience on the part of the examiner. Furthermore, children’s eyes cannot be considered as smaller versions of adult eyes, because they respond differently to medical and surgical treatment.

2.1.1 Prevalence of childhood blindness
As blindness in children is relatively rare, accurate prevalence data are difficult to obtain, because very large samples are required for population based prevalence surveys. Some data are, however, available from population surveys that included children, from community-based rehabilitation programme and from registers of the blind. These sources suggest that the prevalence of blindness in children varies according to socioeconomic development and under-5 mortality rates. In low-income countries with high under-5 Mortality rates, the prevalence may be as high as 1.5 per 1000 children, while in high-income countries with low under-5 mortality rates, the prevalence is around 0.3 per 1000 children If this correlation is used to estimate the prevalence of blindness in children, the number of blind children in the world is estimated to be approximately three-quarters of the world’s blind children live in the poorest regions of Africa and Asia, where the prevalence is high, and the child population large.

2.1.2 Avoidable cause’s childhood blindness

The term avoidable encompasses preventable and treatable causes. Conditions amenable to primary prevention (i.e. where the condition causing blindness could have been entirely prevented) include measles infection, vitamin A deficiency, ophthalmic neonatorum the use of harmful traditional eye medication remedies, and congenital rubella syndrome. Conditions that could have been treated early to prevent blindness (i.e. secondary prevention) include glaucoma and ROP. Causes of blindness where sight can be restored (i.e. tertiary prevention) include cataract and selected cases of corneal scarring. The provision of magnifiers and other low-vision devices is also important in restoring useful visual function. The main avoidable causes of blindness in children are shown in Table 3, together with estimates of the number of prevalent cases affected. The available data suggest that, worldwide, corneal scarring is the single most important cause of avoidable blindness, followed by cataract and ROP. Control of these conditions is given priority in WHO’s VISION
2020 programme, together with correction of significant refractive errors and provision of services for low vision

2.1.3 Control of childhood blindness

Good primary health care and personnel trained in primary eye care are essential for the control of blindness in children. This applies particularly to developing countries, where a high proportion of blindness in children is due to preventable conditions acquired during childhood. Many of the causes of corneal scarring in children would be prevented if the following eight essential elements of primary health care were in place: services for immunization maternal and child health care; health education; good nutrition; essential drugs clean water supplies and good sanitation; control of endemic diseases; and treatment of common conditions. In many countries, measles immunization programme are reaching target coverage levels, and the number of measles cases has been dramatically reduced. There is anecdotal evidence that the success of the Expanded Programme on Immunization (EPI) is also reducing corneal ulceration and scarring in children. International efforts to control vitamin A deficiency in children stimulated by evidence that vitamin A deficiency in childhood is associated with an increased mortality rate are also likely to have an impact, thus reducing corneal scarring in childhood. Approaches to reduce vitamin A deficiency include the promotion of home gardening; health and nutrition education; fortification of commonly consumed foods; food supplementation programme and supplementation for at risk populations with high-dose vitamin A in capsule or syrup form. Linking vitamin A supplementation to routine immunization programme and by distributing vitamin A supplements on immunization days is a recommended strategy to increase coverage and this policy is being adopted by many countries. Primary eye care includes promotion of eye health, action in the community to prevent conditions which cause
Effect of trachoma on blindness in Hargeisa city

blindness, and recognition and treatment of common eye diseases by trained community-level health workers. Primary eye care also includes the identification of children who need referral for ophthalmological assessment and treatment such as any blind child or a child with a white pupil or corneal ulcer. Different cadres of primary health care worker have different roles: traditional birth attendants, for example, can prevent ophthalmic neonatorum and examine the eyes of the newborn for structural abnormalities. At the secondary level of care, an eye surgeon should be able to carry out a full examination and assessment make a provisional diagnosis manage corneal ulcers in children, and prescribe simple low-vision devices for children with less complex problems. School vision-testing programme to identify children with significant refractive errors should also be organized and supported from the secondary level. For effective referral, good communication needs to be established between staff working in the primary and tertiary levels. The management of conditions requiring surgical intervention is more complex in children than in adults, and requires a team of well-trained and well-equipped personnel. Ideally, ophthalmologists providing services for children at tertiary centre need a child centered approach, and they should also be trained in the required specialized surgical techniques and in postoperative management. Effective communication with parents to ensure their involvement is also essential. An anesthetist will be required for young children, and trained nurse’s perfectionists and paramedics are all essential members of the team. Tertiary centers should be able to provide surgical service so high quality for the management of cataract, glaucoma, and corneal scarring. Screening for ROP in preterm infants, as well as the organization and provision of low-vision services, is also a tertiary-level function. Tertiary centers should take responsibility for research; the training of trainers for primary- and secondary-level programme and for supporting, supervising, motivating, and providing feedback to staff in secondary level centers.
2.2 Risk factors of blindness

There are two wonderful and preventable risk factors of blindness which are unsuitable diet and cigarette smoking. The evidence is not purely epidemiological. Much scientific research has now elucidated the various pathological stages by which a diet high in saturated fats or the toxic substances in tobacco smoke can lead to damage to the artery lining and the progression of atherosclerosis. Regular exercise is valuable largely because it helps to improve circulation, control appetite, and control weight.

Blood cholesterol tests are of little value in the diagnosis of atherosclerosis (because such tests do not reveal the state of the arteries) except in cases in which in family history of atherosclerosis.

2.3 Common causes of blindness

Many individuals become blind through complications arising from various diseases of the eye and from disorders such as cataract and glaucoma. Among children the most common causes of blindness include malnutrition, infectious diseases, trachoma, and parasitic infestations. In adults, other blindness-causing conditions include muscular degeneration (MD), Retinitis Pigmentosa (RP) also called Pigmentary Retinopathy, Optic Nerve Atrophy (ONA), AIDS-related Blindness (Cytomegalovirus Retinitis), diabetes mellitus and hypertension. Among elderly people one major cause of blindness is degeneration of the retinal centre (macular degeneration), sometimes because of atherosclerosis.

2.3.1 Glaucoma

Glaucoma is an umbrella term for several diseases that all cause increasing pressure in the fluid in the eye (intraocular pressure). The iris of the eye floats in a small, fluid-filled section of the eye between the outer cornea and the lens. The body continually makes fresh fluid for this Anterior Chamber and continually drains the old fluid from the edges. Sometimes the old fluid does not drain fast enough, or at all,
and pressure builds up. This in turn presses on the inner chamber of the eye and builds up pressure there. This pressure can pinch the blood.

Supply to the optic nerve and cause its nerve cells to die. Usually the person begins to lose peripheral vision first, although they may not notice it. If treatment does not stop the disease, they will gradually progress to tunnel vision, blurred vision, halos around light sources, blind spots, and eventual blindness. Often eye drops or pills can control the increasing pressure in the eye, but sometimes ophthalmologists use laser surgery or other surgery for glaucoma. These surgeries involve opening up the blocked areas through which the fluid normally drains from the anterior chamber.

There are 5 common types of glaucoma: open angle or chronic glaucoma, low-tension or normal-tension glaucoma, closed angle or acute glaucoma, congenital glaucoma, and secondary glaucoma. Closed angle and normal tension glaucoma can happen suddenly, with little warning. Secondary glaucoma is usually a complication of other eye problems or eye surgery.

### 2.3.2 Treatment of glaucoma

The goal of treating glaucoma lies primarily on preventing or delaying the loss of visual field since neuronal cell death is irreversible, no cure is available once the visual field is lost. However since IOP is the primary risk factor causing the loss of RGCs, the strategies of treatment mostly involved lowering IOP. Other important factors such as cost convenience and safety should also be considered. Current treatments for glaucoma include medication, laser use and surgery.

Medications involve inhibiting the inflow of aqueous humor, enhancing the outflow of aqueous humor, protecting the optic nerves and manipulating the osmotic pressure between plasma and the eyes adrenoreceptor agonists and β1 receptor antagonists lower IOP by inhibiting the inflow of aqueous humor to the eye. Timolol, which is the most prescribed drug, and betaxolol, which has the fewest systemic
Effect of trachoma on blindness in Hargeisa city

side effects, are both β1 receptor blockers a third type of drug that inhibits the inflow of humor is carbonic anhydrase inhibitors, such as acetazolamide and dorzolamide. Such drugs are often formulated together as in Cosopt (dorzolamide hydrochloride and timolol maleate) Another method of reducing IOP is by enhancing the outflow of humor from the eyes through the use of muscarinic acetylcholine receptor agonists This mechanism is indirect, but involves a muscarinic acetylcholine receptor (M3)-mediated contraction of the ciliary muscle. The contraction causes the widening of the spaces in the trabecular meshwork. The newest class of drugs using this strategy is the prostaglandin F2α derivatives which enhance the uveoscleral outflow. Bimatoprost falls under this category and is considered the most effective anti-glaucoma drug.

Laser and surgery: A secondary choice of treatment of glaucoma is the use of laser therapy. The primary strategy involves “burning” holes in various areas within the eyes including the ciliary and the pigmented trabecular meshwork cells (24). The benefits include being noninvasive, needing less patient compliance and lowering the possibility of infection or bleeding. The IOP of most patients can decrease about 20-30%, but the treatment effect wears off 5-10% every year. In combination with Timolol, the two year IOP lowering success rate is 70%, compared with the laser alone (44%) and Timolol alone (30%) (24). A common form of surgery is trabeculectomy, which creates a guarded channel allowing aqueous humor to flow from the anterior chamber inside the eye to sub-Tenon’s and subconjunctival space. The benefits of surgery include stabilizing IOP and bypassing the requirements for strict patient compliance and continuous drug costs (24). Surgery is considered as the last resort because failure of surgery can result in immediate blindness due to Complications such as choroid effusion, hypotonic maculopathy, suprachoroidal hemorrhage and optic nerve snuffing.

2.3.3 Diabetic retinopathy
Diabetic retinopathy is a complication of diabetes and a leading cause of blindness. It occurs when diabetes damages the tiny blood vessels inside the retina, the light-sensitive tissue at the back of the eye. As seen in the below diagram a healthy retina is necessary for good vision. If you have diabetic retinopathy, at first you may notice no changes to your vision. But over time, diabetic retinopathy can get worse and cause vision loss. Diabetic retinopathy usually affects both eyes. For several reasons, increased blood sugar levels cause small blood vessels in the Retina to leak and extra blood vessels to grow in the retina. As these newer vessels also start to leak, the leaking blood clouds the eye’s fluid. Any sudden jerks or increases in blood pressure can trigger more leaks. The leaks show up as red, gray, or black dots in the vision field and may take several weeks to slowly fade. The bleeding and the scarring it causes on the retina can cause parts of the retina to detach from the back of the eye. Often, laser treatment can seal up the blood vessels or re-attach sections of the retina. However, laser treatment can also damage night vision, or cause the retina to swell (muscular edema) leaving blind spots called “scotomas.” Another possible treatment is a Vitrectomy in which the eye surgeon removes the clouded fluid in the eye and replaces it with an artificial fluid. Another problem with Diabetic Retinopathy is Macular Edema (ME), or swelling of the macula at the center of vision. This swelling upsets the physical mechanisms for focusing images on the macula. The result is blurred vision that makes the person feel like they are looking through rumpled cellophane. The best treatment for all of these symptoms is control of the person’s diabetes and blood sugar levels, but even that may not prevent vision loss.

2.3.4 Stages of diabetic retinopathy

1. Mild Non proliferative Retinopathy: - At this earliest stage micro aneurysms occur they are small areas of balloon like swelling in the retina’s tiny blood vessels.
2. Moderate Non proliferative Retinopathy.
As the disease progresses, some blood vessels that nourish the retina are blocked

3. Severe Non proliferative Retinopathy.
   Many more blood vessels are blocked, depriving several areas of the retina with their blood supply. These areas of the retina send signals to the body to grow new blood vessels for nourishment.

4. Proliferative Retinopathy.
   At this advanced stage, the signals sent by the retina for nourishment trigger the growth of new blood vessels. This condition is called proliferative retinopathy. These new blood vessels are abnormal and fragile. They grow along the retina and along the surface of the clear, vitreous gel that fills the inside of the eye. (See diagram on previous page.) By themselves, these blood vessels do not cause symptoms or vision loss. However, they have thin, fragile walls. If they leak blood, severe vision loss and even blindness can result.

2.3.5 Risk factors for diabetic retinopathy
   All people with diabetes both type 1 and type 2 are at risk. That’s why everyone with diabetes should get a comprehensive dilated eye exam at least once a year. Between 40 to 45 percent of Americans diagnosed with diabetes have some stage of diabetic retinopathy if you have diabetic retinopathy, your doctor can recommend treatment to help prevent its progression during pregnancy, and diabetic retinopathy may be a problem for women with diabetes To protect vision every pregnant woman with diabetes should have a comprehensive dilated eye exam as soon as possible. Your doctor may recommend additional exams during your pregnancy.

2.3.6 How diabetic retinopathy cause blindness
   Blood vessels damaged from diabetic retinopathy can cause vision loss in two ways
   1. Fragile, abnormal blood vessels can develop and leak blood into the center of the eye blurring vision. This is proliferative retinopathy and is the fourth and most advanced stage of the disease.
Effect of trachoma on blindness in Hargeisa city

2. Fluid can leak into the center of the macula, the part of the eye where sharp, straight ahead vision occurs. The fluid makes the macula swell, blurring vision. This condition is called macular edema it can occur at any stage of diabetic Retinopathy, although it is more likely to occur as the disease progresses about half of the people with proliferative retinopathy also have macular edema

2.3.7 Treatment of diabetic retinopathy
During the first three stages of diabetic retinopathy, no treatment is needed, unless you have macular edema. To prevent progression of diabetic retinopathy, people with diabetes should control their levels of blood sugar, blood pressure, and blood cholesterol. Proliferative retinopathy is treated with laser surgery. This procedure is called scatter laser treatment. Scatter laser treatment helps to shrink the abnormal blood vessels. Your doctor places 1,000 to 2,000 laser burns in the areas of the retina away from the macula causing the abnormal blood vessels to shrink. Because a high number of laser burns are necessary, two or more sessions usually are required to complete treatment. Although you may notice some loss of your side vision, scatter laser treatment can save the rest of your sight. Scatter laser treatment may slightly reduce your color vision and night vision. Scatter laser treatment works better before the fragile, new blood vessels have started to bleed. That is why it is important to have regular, comprehensive dilated eye exams. Even if bleeding has started, scatter laser treatment may still be possible, depending on the amount of bleeding. If the bleeding is severe, you may need a surgical procedure called a vitrectomy. During a vitrectomy, blood is removed from the center of your eye.

2.3.8 Cataract
A cataract causes cloudiness in the clear lens of the eye. When both eyes are affected, the condition is cataracts (with an s). Deterioration and clumping up of the transparent proteins that make up the lens cause the cloudiness, which usually
involves the entire lens. Researchers are not sure why this happens, but age, smoking, and long exposure to sunlight seem to be common factors. Symptoms of significant cataract include cloudy or blurry vision, halos around lights at night, problems with glare from sunlight or bright lights, poor night vision, reduced color vision, and double vision. Most people get some clouding of the lenses as they age, and most cases of diagnosed cataracts are age-related. However, there are some other types of cataract including congenital cataract (develop in young children), cataract secondary to diseases like diabetes, cataract caused by steroid use, and cataract that develops after an eye injury. Fortunately, cataract is very treatable. When the lens becomes cloudy enough to be a serious problem, an eye surgeon can remove it and replace it with an artificial lens called an Intraocular Lens (IOL). On occasion an IOL is not appropriate and they may use contact lenses or powerful glasses to replace the lens. Sometimes the surgeon leaves at least part of the original lens in place and sometimes that remainder becomes cloudy because of an After Cataract Eye specialists usually use laser surgery to remove these after cataracts.

2.3.9 Optic nerve atrophy

Although some people use it as a catch-all term for several types of blindness Optic Nerve atrophy is actually a symptom, not a disease. It is a technical term for damage to the optic nerve, which can be caused by many different medical problems. In infants, causes include lack of oxygen in the body (hypoxia), trauma, tumors, and several hereditary conditions. In adults, causes include lack of blood to the nerve (“ischemic optic neuropathy”), shock, trauma, multiple sclerosis, tumors, and stroke. Glaucoma, described above, is a type of ONA. Some toxins can cause ONA and one source says the most common toxic cause in adults is methanol from “home brewed alcohol.” There are many symptoms of ONA, including overall dimming of vision, loss of acuity (ability to see fine detail), reduced color vision, and total blindness. Because ONA involves nerve damage, there is usually no treatment except controlling the underlying cause, and the vision usually does not come back.
2.3.10 AIDS related Blindness (Cytomegalovirus Retinitis)
Cytomegalovirus (CMV) is a herpes-type virus that can cause eye problems. Most adults over age 40 have antibodies to CMV, which means they have been infected and their immune system has neutralized it. People with impaired immune systems, including people with HIV/AIDS, people receiving chemotherapy, and recipients of organ transplants, can have serious problems with CMV. CMV Retinitis can cause bleeding and inflammation in the retina or detachment of the retina. It usually begins in one eye and spreads to the other. Without treatment, it causes blindness in 4 to 6 months. Treatment can slow down the damage, but not repair it.

2.3.11 Macular degeneration
Macular Degeneration is a gradual loss of vision in the macula, the central part of the visual field. Usually, even in extreme cases, the person has peripheral vision and often they are able to “work around’ the missing parts of their central vision. There are two common types of Macular Degeneration: Early Onset Macular Degeneration and Age related Macular Degeneration (AMD or ARMD)(there are a few other, less common forms of MD as well). Early Onset MD is generally caused by one of several inherited conditions that cause the retinal cells in the macula to fail or begin to die. The degeneration is usually slow, and it can take decades to significantly reduce the person’s central vision.

2.4 Nutritional blindness
Nutritional blindness is a term used to describe xerophthalmia which is derived from two Greek words the word Xero which means dry and the word ophthalmic which means inflamed eye and keratomalacia which means corneal necrosis caused by vitamin A deficiency according to the world health organization (WHO) estimation nutritional blindness is one of the leading cause of blindness among children as a worldwide. Vitamin A is the most common nutritional cause of childhood blindness in countries with low production or utilization of fruits and vegetables which are rich source of vitamin A. Xerophthalmia and Keratomalacia are the aspect of only
Effect of trachoma on blindness in Hargeisa city

one more complex of deficiency disease which is known as vitamin A deficiency disorder that includes Anemia, Growth retardation, Immune suppression, Inflammation, and increased risk of morbidity and mortality from infectious diseases.

Nutritional blindness is more understood in the context of the larger syndrome of the vitamin A deficiency syndrome as the factors that may precipitate the nutritional blindness children and females especially those are pregnant or lactating with poor sanitation and low lifestyle are said to be the most common risk factors for vitamin A deficiency and early blindness. All of the programs of preventing blindness is now focused on those two high risk factor groups, the elimination of vitamin A deficiency in developing countries is one of the major challenges of public health and ophthalmology as the blindness morbidity and mortality from the vitamin A disorders are more preventable.

Malnutrition itself is a complex phenomenon that broadly defined as malnutrition it refers to the condition of inappropriate intake of nourished and required type of food in the past t condition or in complete absorption of the intestines that leads the loss many nutritious substances that are important for the body.

In developing countries with low income in the context of health issue malnutrition is Often used this term of of “under nutrition” associated with what was presumed to be protein energy malnutrition and operationally defined as a deficit in anthropometric status or by the presence of clinical signs such as edema or altered hair color In more recent years various vitamin and mineral deficiencies, including vitamin A, iron, iodine and zinc have been recognized as separate types of malnutrition

2.5 Trachoma

Trachoma is an infection of the eye caused by a bacteria like parasite named Chlamydia trachomatis which is related to the organism that causes psittacosis. Infection is spread by the bite of a host fly Characterized by hard pustules or granular excrescences on the inner
Effect of trachoma on blindness in Hargeisa city

surface of the eyelids, inflammation of the membrane, and subsequent involvement of the cornea, trachoma is a major cause of blindness in some villages in northern Africa. It is most commonly occurs among populations living under poor sanitary conditions.

The disease begins after an incubation period of five to seven days with inflammation of the eye. Ensuing symptoms are considerable discharge of pus, swelling of the lids, tearing, and increased sensitivity to light. It goes on in a few weeks to chronic swelling, formation of blisters in the eye, and destruction and scarring of the cornea, which eventually causes blindness. In its early stages trachoma responds readily to the topical, and sometimes oral, administration of broad-spectrum antibiotics. In the 1950s the World Health Organization (WHO) instituted a broad programme for elimination of the disease.

2.5.1 Classification stages of trachoma

According to the world health classification (WHO) of trachoma there are about 5 stages which are as follows:

1) Trachomatis inflammation follicular: - this means the presence of 5 or more follicles in the upper tarsal of the conjunctiva, follicles are around swellings that are paler than the surrounding conjunctiva appearing white yellow or gray, follicles must be at least 0.5MM in diameter at least as large as the dots shown bellow to be considered.

2) Trachomatous inflammation intense: - this is also named as inflammatory thickening of the tarsal conjunctiva that obscures more than half of the normal deep of the tarsal vessels.

The tarsal conjunctiva appears red rough and thickened there are usually numerous follicles which may be partially or totally covered by the thickened conjunctiva.

3) Trachomatous scarring: - means the presence of scarring in the tarsal conjunctiva, scars are easily visible as white lines, bands or sheets in the tarsal conjunctiva they are shiny and fibrous may obscure the tarsal blood vessels.
4) Trachomatous trichiasis: - this is usually mentioned when at least one eyelash rubs on the eyeball. Evidence of recent removal of in turned eyelash should also be graded as trichiasis.

5) Corneal opacity:- means visible corneal opacity over the pupil, the pupil margin is blurred viewed through the opacity such corneal opacities are cause significant visual impairment less than 6/18 or 0.3 vision. Therefore visual acuity should be measured if possible.

2.5.2 Epidemiology

Trachoma is the world’s leading cause of preventable blindness it is thought to affect more than 400 million people in the endemic areas in Africa, India and Middle East in some endemic areas like Tunisia, nearly all the children are infected by the age of two years old. The infected children are then served as the reservoir for further transmission at present and estimated 146 million people have active infection with the microorganism Chlamydia trachomatis for which antibiotic treatment is indicated. There are approximately 10.6 million adults within turned eyelashes for which eyelid surgery is needed to prevent blindness an estimated 5.9 million adults are blind from corneal scarring due to trachoma.

Approximately 80% of blindness is preventable and curable in Somaliland much has remained unknown regarding to the etiology prevalence and magnitude of ocular disease however the number of community based studies in different parts of the country revealed that the leading causes of blindness is trachoma 42% and cataract 29%. The remaining causes are glaucoma, malnutrition, and other eye infections. Eye diseases including trachoma accounted for 5.4% of the leading causes of outpatient morbidity in Somaliland in 2001/2002 and also one of 15 leading causes of hospitalization a study conducted from February to may 1999, in Ethiopia on prevalence and associated risk factors of trachoma among women aged 15 to 49 years old in Ethiopia showed that the prevalence rate of trachoma among women and children were 41% and 73.5% respectively the study also indicated that care
Effect of trachoma on blindness in Hargeisa city

Takers of children of age 1 to 7 years were found to be at a higher risk acquiring the disease than non-care takers and those women without children 1 to 7 years old. Furthermore, the educational status, frequency of face washing, availability of latrine facilities, age of women, and family size were found to be highly associated with trachoma prevalence.

2.5.3 Path physiology
Vision loss in trachoma results from repeated ocular infections over many years in endemic regions and most of the children are infected by a year or two of life, and toddlers constitute the principle reservoir of C trachoma. The organism is spread within population by flies, fomites that are contaminated by secretions or possibly aerosol droplets. The cycle of repetitive infections though childhood, adolescence and adulthood causes progressive conjunctivitis, scarring, and corneal damage. During active infections, mucopurulent keratoconjunctivitis with follicular inflammation is typical. Individual episodes heal but with repeated infections, the conjunctival damage eventually results in entropion and trichiasis.

Scarring of the tarsal conjunctiva, chronic inflammation, ulceration, and corneal scarring defines the cicatricial phase of disease. Neovascularization and the appearance of granulation tissue or pannus lead to corneal opacities. Complete blindness ultimately ensues usually in fourth or fifth decades.

2.5.4 Etiology and pathogenesis
Trachoma is a chronic and recurrent conjunctivitis caused by a bacterium called Chlamydia trachomatis. It is transmitted by direct contact with infectious ocular or nasopharyngeal discharge from infected people on fingers. It can also transmit indirectly with contaminated fomite such as towels, clothes, and other soiled materials. Flies contribute to the spread of the disease.
Effect of trachoma on blindness in Hargeisa city

Trachoma begins as inflammation of conjunctiva with the formation of small tumor like lymph follicles, infected cells die and surrounding areas become filled with discharge, scar tissue containing fibroblasts develop and can extend in to the eye lids. As the disease progresses the eye lids are turned inwards the eyelids rub on the conjunctiva causing corneal ulceration as a result of repeated rubbing of the cornea then loss of vision may occur after all.

2.5.5 Clinical features of trachoma
According to the clinical presentation of trachoma up to three quarters of children with active trachoma exhibit no symptom but ocular active infections are characterized by Tearing of the eyes, Prurites, Edema, Redness and swollen of the eyes, Patient become uncomfortable to light or light sensitive (photophobia) Scarring and shrinkage of conjunctiva Enteropion (in turning of the lid margin of the eyes) Trichiasis (rubbing of eyelashes on the cornea) and pain lymphoid follicles become famous in whitish, Grey, or yellow elevations, inflammatory thickness and hyperemia of the conjunctiva are common particularly under the tarsal plate depending on the frequency and the severity of prior infections, conjunctiva scarring may be present and appears as white lines and patches on an erythematosus background.
Following the cicatricial phase findings consistent with chronic trachoma including neovascularization and pannus originating at the limbus and extending in to the cornea Enteropion and trichiasis are often clearly visible.

2.5.6 Prevention and treatment
According to the way of prevention and treatment the safe surgery encapsulates trachoma treatment and prevention objectives, surgery for trichiasis, antibiotic therapy, facial cleanliness in young children and environmental improvement like latrine building and improved access to water and to reduce transmission.
Effect of trachoma on blindness in Hargeisa city

Single dose of azithromycin which is antibiotic is the drug of choice, annual mass treatment of populations with moderate or high disease prevalence has been recommended to cure sufficient numbers of children such that the community’s bacterial reservoir is reduced, in this approach ocular infection rates in some regions have plummeted from 10% to 0.1% in as few as several years.

2.5.7 Diagnoses of trachoma

According to the diagnosis there are two types of diagnosis and they are

- Diagnosis based on clinical signs and symptoms
- And laboratory diagnoses like Geimsa, stain, serological test and cells culture.
CHAPTER THREE
Research methodology

3.0 Introduction
3.1 Research design
3.2 Advantages of correlation
3.3 Research population
3.4 Target population
3.5 Sample size
3.6 Sampling procedure
3.7 Research instrument
3.8 Validity and reliability
3.9 Data analysis
3.10 Ethical consideration
3.11 Limitations of the study
Chapter three: - research methodology

3.0 Introduction
This chapter will be presented the procedures used in conducting the study and it is organized as the following sub-headings like research design, target population, sample size, sampling procedure, research instrument, validity and reliability data gathering procedure, data analysis, ethical considerations, and limitations of the study.

3.1 Research design
This study was conducted to realize the role of trachoma on blindness in Hargeisa city. The respondents involved this study comprise from two four and matriculation students from several secondary schools. The sampling technique used in this study was correlation sampling approach.

The importance of using correlation sampling approach is to carry out whether one or more variables can predict other variables. Correlation approach is the basic for many kinds of analysis, correlation method allows as to find out what variables may be related, however the fact that two things are related or correlated does not mean there is a cause relationship. It is important to make a distribution and causation two things can be correlated without being a causal relationship.

3.2 Advantages of correlation
Effect of trachoma on blindness in Hargeisa city

- Correlation approach collects more information from many subjects at one time
- Study a wide range of variables and their interpretations
- Most of the variables show some kind of relationship
- Once we know that two variables are closely related we can estimate the value of one variable given the value of another.

3.3 Research populations
The total number of targeted populations is 100 households

3.4 Target population
This study was done in Hargeisa district and the number of targeted populations is 100 people who are present with eye disease.

3.5 Sample size
The sample size selection formula of this study is 40. The sample that have been given some of questions by using questionnaire and the responses on each them have been presented in to different graphs and figures to determine the sample size the researcher will be guided by the Slovenes sample selection formula, which is

\[
n = \frac{N}{1 + N \times e^2}
\]

Where
- \( n \) = Number of sample
- \( N \) = total population
- \( e \) = level of significance 0.05

3.6 Sampling procedure
During this research procedure I will use as non probability sampling design to come up with the 20th respondents this technique was used on the assumption that every individual had same chance to be selected with respected gender age marital status and education, in this sampling procedure respondents will randomly select
Effect of trachoma on blindness in Hargeisa city

according to their willingness to participate and fill the questionnaire and for their desire to know what the findings will be a sample of 20th respondents will be surveyed within Hargeisa city, single members of the sample where divided equally among four eye clinic facilities selected for which data collection tool will be distributed as summarized in the table below.

<table>
<thead>
<tr>
<th>District</th>
<th>Health facility surveyed NO</th>
<th>Proportion of facility surveyed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manhal Hospital</td>
<td>5</td>
<td>20%</td>
</tr>
<tr>
<td>Sayid Ahmed Eye Clinic</td>
<td>5</td>
<td>20%</td>
</tr>
<tr>
<td>Dr Gaas</td>
<td>5</td>
<td>20%</td>
</tr>
<tr>
<td>Ahmed Gabiley</td>
<td>5</td>
<td>20%</td>
</tr>
<tr>
<td>Gargaar Hospital</td>
<td>5</td>
<td>20%</td>
</tr>
</tbody>
</table>

3.7 research instrument

By the time of doing this research there was one important instrument which was used in the date collection. Questionnaire was basically the instrument which was used. Questionnaire was mostly given to eye hospitals especially Manhal hospital, Sayid Ahmed eye clinic, Dr Gas, Ahmed Gabiley, and Gargaar hospital to fill it with their opinion or ideas about outcomes of Trachoma on Blindness in Hargeisa city. This form of questionnaire basically formulated in to two main types which are open ended questions and close end questions, the method used for data collection of the research will be survey which is form of for data collection and uses questionnaire form. The method of date collection and it is quality formulation is based on the researchers way of understanding for how to do this method and his/her effort to spend findings about this research topic.

3.8 Validity and Reliability

In order for any research to be valid and reliable there should be pretesting phase and this research applies that method and will test five questionnaires initially to
Effect of trachoma on blindness in Hargeisa city

ensure that the information that will be generated is appropriate and consistent. Before starting the distribution of the questionnaires, I shall consult my supervisor to seek this expertise and advice. To improve the validity of the data collection instrument mainly the questionnaires the number of relevant questions will be divided by the total number of questions and the outcome will have to be above optimal.

\[ V = \frac{RQ}{TTQ} = \frac{14}{19} = 0.73 \]

Where:

- \( V \) = Validity
- \( RQ \) = Relevant questions
- \( TQ \) = Total number of questions

3.9 Data analysis

After all questionnaires come back on hand then it’s the time of digesting and analyzing the available data into sensible information which helps decision making in that regard, and as well can be taken forward further by other relevant researchers in the future. The data will be analyzed manually with description tabular and graphical representations of the results which is easy to be understood by the interested average reader.

3.10 Ethical considerations

This topic is sensitive and well essential to be approached in this regard I shall take into account all ethical considerations which may include but not confined to seeking permission, ideally respect, confidential information protected, not disclosed to any one and used for the purpose of this research only. Professionalism and meeting standard expected behavior will be observed strictly.

In case and where ever I am unsure of the step I am supposed to take I am obligated to seek the expertise and advice of my supervisor who guides me accordingly in the previous chapters of this research.

3.11 Limitations of the study
1. Instrumentation: - the resource instrument and resource availability and utilization are not standardized therefore a validity and reliability test will be done to produce a credible measurement of the research variable.

2. Inadequate resource: - these include lack of books used as reference also the internet availability was insufficient.

3. Questionnaire limitations: - there was not enough pilot phase in this research which means the questionnaire pre-tested but not the right number because of technical and time factors faced.

CHAPTER 4
ANALYSIS, PRESENTATION, AND INTERPRETATION
4.0 Analysis, Presentation, and Interpretation

4.1 Analysis and Presentation

This chapter comprises of data analysis, presentation, and interpretation of the study findings. The chapter is divided into subsections where general demographic characteristics of the respondents such as age and marital status are analyzed. In addition the data is also analyzed around key variables relating to the effect of trachoma on blindness in Hargeisa city.

Table 1. Age of the respondents

<table>
<thead>
<tr>
<th>Age of the Respondents</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 – 17</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>18 – 33</td>
<td>18</td>
<td>90%</td>
</tr>
<tr>
<td>34 – 49</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Above 65</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

FIGURE 1
Figure 4.1: This table shows the age of the respondents

As shown the above figure the respondents of this research consist of the following ratio. 5% were between 15 - 17 years of age. 90% where between 18-33 years of age. 5% where 34-49 years of age and 0% where above 65 years of age the majority of the respondents approached for finding date about effect of trachoma on blindness in Hargeisa city where those ages is between 18-33 years old as we can see the above figure.

Table 2: Marital status of the respondents

<table>
<thead>
<tr>
<th>Marital status</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>married</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>single</td>
<td>11</td>
<td>55%</td>
</tr>
<tr>
<td>divorced</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

FIGURE 2
FIGURE 4.2: shows marital status of different respondents as the following ratio: 20% where divorced, 25% where married, and 55% where single. So the majority of the data was fully collected by those that are single.

Table 4.3: educational level of the respondents

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHD</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Master</td>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td>Degree</td>
<td>14</td>
<td>70%</td>
</tr>
<tr>
<td>Diploma</td>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td>Certificate</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Others</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

FIGURE 3
Effect of trachoma on blindness in Hargeisa city

**FIGURE 4.3:** Shows the level of education of different respondents

As seen above 70% of the respondents where Degree level university, 15% where Master level university, 15% where Diploma level. 0% where PHD level, 0% where certificate level, and the remaining 0% where others.

So those that are provided the highest percentage of the date required for the respondents where those that are Degree level of education.

<table>
<thead>
<tr>
<th>Table 4.4: common causes of blindness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common causes of blindness</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>Trachoma</td>
</tr>
<tr>
<td>Glaucoma</td>
</tr>
<tr>
<td>Malnutrition</td>
</tr>
<tr>
<td>Cataract</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
</table>
**FIGURE 4.4:** Shows the common causes of blindness

As shown in the above diagram, 35% of the causes is Trachoma, 35% is Cataract, 20% is Glaucoma, while the remaining 10% is attributed to Malnutrition condition.

**Table 4.5:** Common risk factors of blindness

<table>
<thead>
<tr>
<th>Common Risk factors on blindness</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children under 5 years</td>
<td>6</td>
<td>30%</td>
</tr>
<tr>
<td>Malnourished people</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>Adults over 65 years</td>
<td>9</td>
<td>45%</td>
</tr>
<tr>
<td>Diabetic people</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**FIGURE 5**
Effect of trachoma on blindness in Hargeisa city

FIGURE 4.5: Shows the common risk factors of blindness.

Where 45% of the most common risk factors are mentioned to be adults above 65 years of age, 30% are children less than 5 years of age, 25% of the risk ones are malnourished people.

Table 4.6: Blindness is more common in children

<table>
<thead>
<tr>
<th>Blindness is more common in children</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>45%</td>
</tr>
<tr>
<td>No</td>
<td>11</td>
<td>55%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>20</td>
<td>100%</td>
</tr>
</tbody>
</table>

FIGURE 6
Effect of trachoma on blindness in Hargeisa city

FIGURE 4.6: Shows that trachoma is more common in children

In which 55% of respondents are agreed No, while the remaining 45% are said yes.

Table 4.7: Hygiene promotion

<table>
<thead>
<tr>
<th>Hygiene promotion</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>19</td>
<td>95%</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

FIGURE 7
FIGURE 4.7: Shows if the hygiene promotion is the first choice of preventing trachoma and other eye infections.

As we can see the above figure 95% of the respondents agree that hygiene promotion is the first choice while the remaining 5% disagree that hygiene promotion is the first choice of trachoma and other eye infections.

Table 4.8- Source of trachoma

<table>
<thead>
<tr>
<th>Source of Trachoma</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arid and semiarid area</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
<td>Wet and rainy areas</td>
<td>13</td>
<td>65%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

FIGURE 8

FIGURE 4.8 Shows if the respondents known the source of trachoma

So as shown above 65% of the respondents where signed that the source of trachoma wet and rainy areas while the remaining 35% where signed arid and semiarid areas.
Table 4.9 - Shows if the respondents known the most wonderful and preventable risk factors of blindness causing by trachoma

<table>
<thead>
<tr>
<th>Which class trachoma is more common</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low class client</td>
<td>17</td>
<td>85%</td>
</tr>
<tr>
<td>Income don’t affect</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>High income client</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**FIGURE 9**

The diagram above shows that 85% of the respondents are agree, 10% where the strongly agree and the rest 5% of the respondents where disagree that most wonderful and preventable risk factors are unsuitable diet and Cigarette smoking.

Table 4.10 - Eye infections

<table>
<thead>
<tr>
<th>Eye infection</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
FIGURE 10 translates the respondents like to know eye infections and their way of treatment.

In which 100% of the respondents were liked while the remaining 0% of the respondents were not liked.

**Table 4.11- Diabetic Retinopathy**

<table>
<thead>
<tr>
<th>Diabetic retinopathy</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>19</td>
<td>95%</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
FIGURE 11

![Diabetic Retinopathy Graph]

**FIGURE 4.11 - Shows the effect of diabetic retinopathy in blindness**

As shown above 95% of the respondents are agreed and the rest 5% were disagree.

**Table 4.12 – causes of blindness in children**

<table>
<thead>
<tr>
<th>Causes of blindness in children</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor children hygiene</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
<td>Poor maternal hygiene</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Congenital diseases</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
<td>Malnutrition condition</td>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**FIGURE 12**

![Causes of blindness in children Graph]
Effect of trachoma on blindness in Hargeisa city

Figure 4.12- translates as the causes of blindness in children

Where 35% of the respondents marked as poor children hygiene, 35% marked congenital diseases, 20% of the respondents marked poor maternal education of hygiene, and the rest 10% of the respondents marked malnutrition in children.

Table 4.13- Degree of blindness

<table>
<thead>
<tr>
<th>Degree of blindness</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>Decreasing</td>
<td>8</td>
<td>40%</td>
</tr>
<tr>
<td>Normal</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

FIGURE 4.13- Shows the degree of blindness

40% out of the respondents where fully marked as decreasing, another 35% of them marked as normal, the rest 25% where marked as increasing.

Table 4.14- most effectively solve of blindness problems

<table>
<thead>
<tr>
<th>Most effectively solve of blindness problems</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Effect of trachoma on blindness in Hargeisa city

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community awareness</td>
<td>10</td>
<td>50%</td>
</tr>
<tr>
<td>Hygiene promotion</td>
<td>6</td>
<td>30%</td>
</tr>
<tr>
<td>Eradication of the causative agent</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**FIGURE 14**

**FIGURE 4.14**- Shows if the respondents known the most effectively solve of blindness problems.

So as seen above diagram 50% of the respondents were advised to make community awareness, 30% of them were advised make hygiene promotion, and the rest of the respondents were advised eradication of the causative agent.

**Table 4.15- Protecting Trachoma**

<table>
<thead>
<tr>
<th>Protecting trachoma</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of health</td>
<td>18</td>
<td>90%</td>
</tr>
<tr>
<td>Private health sectors</td>
<td>1</td>
<td>5%</td>
</tr>
<tr>
<td>Other health professionals</td>
<td>1</td>
<td>5%</td>
</tr>
</tbody>
</table>
FIGURE 15 collects data from those respondents that answer the research questionnaire to provide their opinion about Which part of the community do they think that they are responsible for taking decisions about protecting trachoma and its effect on blindness.

As the trachoma is one of the leading cause of blindness in children the respondents of this research questionnaire exhibit their opinions about the part of the community that they think they are responsible for decision blindness causing trachoma.

In which 90% of them agreed that ministry of health is the one with the highest percentage of the responsibility, were 5% of them agreed private health sectors, and the remaining 5% were said to be other health professionals.

Table 4.16 – Trachoma

<table>
<thead>
<tr>
<th>Trachoma</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>agree</td>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>disagree</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Figure 4.16- focuses on if the questionnaire respondents fully supported that Trachoma can cause severe blindness in childhood if not threaded well.

Trachoma can cause severe aye blindness in children specially if not early treated or contacted by ophthalmologist as approved by 100% of the respondents.

Since majority of them were ophthalmologists and their assistances, and their where no respondents that proved if trachoma causes severe eye blindness if not treated.

Table 4.17- Vitamin A deficiency

<table>
<thead>
<tr>
<th>Vitamin A deficiency</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>20</td>
<td>100%</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Figure 4.17 - Shows the effect of vitamin A deficiency on blindness

As shown in the above figure the respondents agreed 100% that vitamin A deficiency is highly affect the degree of blindness while there were no anyone who disagree this idea.
CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.0 conclusion and recommendation

5.1 Discussion and conclusion

5.2 Recommendation
5.0:- CONCLUSION AND RECOMMENDATIONS

This is the last chapter of thesis research about the effect of trachoma on blindness which summarizes the findings of the study in line with the research objectives discussion on the major findings of the study is also included followed by recommendations which are based on the findings of the study.

5.1:- DISCUSSION AND CONCLUSION

This thesis research enhances the degree of advantage between the effect of trachoma on blindness and risk of the health state benefits of the community to realize it, as shown the respondents about the questionnaire we can feel that most of them were knowledgeable to relationship between trachoma and blindness but the sense about this is to continue educating community health issue in general specially different eye infections their treatment and their prevention like trachoma which is the most leading cause of child blindness may be most of the respondents were familiar with trachoma and its risk on eyes as the result of blindness, but it has also been approved that knowledge of realizing eye infections and their treatment is still familiar in towns while the most risk populations are the rural ones which don’t understand any causative any treatment of the eye infections, perhaps they may also use some cultural management methods with in the eyes like goat milk and trees with may affect and damage the eye itself because of unlimited dose of both may be used as treatment. The additional problem that is well-known our community is the delay of treatment later than the required time due to unknown of the disease or absence of transportation if the area is some were far away of the health facility.

5.2:- RECOMMENDATIONS

- Realizing the impact of trachoma on blindness is important to all part of our community health because they all need a full health condition while the eye s are the first source that needs to be cured and fully cared.
- Realizing or educating community about infections and diseases especially eye infections is very important step the leads to decline the degree of eye blindness in the community because it helps people to prevent or eliminate the causative agent of eye disease.
- Since this disease is severe it is necessary to educate people how to promote facial cleanliness and trachoma control in general which may include. Educating the community about trachoma and how it spreads
Effect of trachoma on blindness in Hargeisa city

Encouraging acceptance of surgery, increasing acceptance of antibiotics, Encouraging facial cleanliness, Promoting clean environmental and creating demand for household latrines

Advice how to deliver health promotion so that it can contribute in all these ways is presented in this section to be effective, health promotion should be planned in partnership with the community and delivered continuously or repeatedly to the target population.
APPENDICES

Appendix A: Reference

Appendix B: sample of the questionnaire used
Appendix A: Reference

Definition of free online dictionary

http://thefreedictionary.com/trachoma on blindness

Mekale Demena, Nega Baraki, Berhanu, Seyoum, Tekabe Abdosh, Alemayahu Galmesa, Salemon Tawes, and Misrak Bersu.

Haramaya University

In collaboration with the Ethiopian public health training initiative ministry of health and the Ethiopia ministry of education

Wikipedia: the free online encyclopedia

http://en.wikipedia.org/wiki/trachoma

National blindness information clearance house

Effect of trachoma on blindness in Hargeisa city

Appendix B: Sample of the questionnaire used

University of Hargeisa
Faculty of science and technology
Department of Nutrition and food science

To my dear respondents,

My name is A/rahman Osman Jama one of the senior students at University of Hargeisa, so i am kindly requesting you to fill this questionnaire as the best as you can, this questionnaire will be done for the purpose of graduation thesis and i am promising you that it will not be published for any other purpose by any other one except that it is based on thesis writing.

Sir/lady your positive feedback is very important for me so please don’t ignore or don’t hesitate to fill the blank spaces of this questionnaire to back up my thesis writing.

If you have any further information related with this study please don’t hesitate to contact me.

Thank you so much
Yours faithfully

Researcher Name: - A/rahman Osman Jama
E-mail:- cabdi_xaaji06@hotmail.com or Haji06@gmail.com
Tell: - 2522-2-634014458 telesom. Or 2522-2-659104565 Somtel
1. Please tick your age?

- [ ] 15-17 years
- [ ] 18-33 years
- [ ] 34-49 years
- [ ] 50-65 years
- [x] Over 65 years

2. What is your marital status?

- [ ] Married
- [ ] Single
- [ ] Divorced

3. What is your level of education?

- [ ] PHD
- [ ] Master
- [ ] Degree
- [ ] Diploma
- [ ] Certificate
- [ ] others

4. What are the most common causes of blindness in your Hospital?

- [ ] Trachoma
- [ ] Glaucoma
- [ ] Malnutrition
- [ ] Cataract

5. Who are the most common risk factors of blindness in your Hospital?

- [ ] Children under 5 years
- [ ] Malnourished people
- [ ] Adults over 65 years of age
- [ ] Diabetic people
6. Do you think that blindness is usually more common in children according to other adult people?
   - Yes
   - No

7. Do you agree that hygiene promotion is the first choice of preventing trachoma and other eye infections?
   - Agree
   - Disagree

8. From the following list, which area do you think that it is the source of trachoma?
   - Arid and semi arid areas
   - Wet and rainy areas

9. According to the economic status in which class do you think that trachoma is more common?
   - Low income clients
   - Income don’t affect
   - High income client

10. Would you like to know more about eye infections and their way of treatment?
    - Yes
    - No

11. Diabetic retinopathy is a complication of diabetes and a leading cause of blindness, it occurs when diabetes damages the tiny blood vessels inside the retina?
    - Agree
    - Disagree

12. What are the most common causes of blindness in children in Hargeisa city?
    - Poor children hygiene
Effect of trachoma on blindness in Hargeisa city

☐ Poor maternal education of hygiene
☐ Congenital disease
☐ Malnutrition condition

13. How do you feel about the degree of blindness in children in Hargeisa city for the last two years?
   ☐ Increasing
   ☐ Decreasing
   ☐ Normal

14. In your opinion, which of the following would make it possible to most effectively solve of blindness problems in Hargeisa city?
   ☐ Community awareness
   ☐ Hygiene promotion
   ☐ Eradication of the causative agent

15. Which part of the community do you think are the most responsible for taking decisions about protecting trachoma and its effect on blindness?
   ☐ Ministry of health
   ☐ Private health sectors
   ☐ Other health professionals

16. Trachoma can cause severe blindness in childhood if not threaded well
   ☐ Yes
   ☐ No

17. Vitamin A deficiency can lead to cause eye blindness if not taken as supplement
   ☐ Agree
   ☐ Disagree
18. What are your last words that you are interested to recommend your community to decrease the incidence of blindness and its harmful effect?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________