GLAUCOMA PREVALENCE, AWARENESS, AND PRACTICES AMONG ADULTS AGED ABOVE 35 YEARS IN HOMABAY TOWN SUB-COUNTY.

BY

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DECLARATION

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I, Jectone Owoko Oduor do hereby declare that this thesis is my original work and has not been submitted for the award of a degree or diploma in any other University or college.

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May Almighty God bless you abundantly.

DECLARATION OF PLAGIARISM

I, Jectone Owoko Oduor, solemnly declare that the research work entitled "Glaucoma Prevalence, Awareness, and Practices Among Adults Aged Above 35 Years in Homabay Town Sub-County" is entirely my own work and has not been previously submitted for any academic qualification at any other institution. I assure that all sources of information and ideas incorporated in this study have been duly acknowledged and referenced.

I fully comprehend the significance of upholding academic integrity and hereby affirm that I have not partaken in any form of plagiarism, whether it be the unauthorized use of others' work without proper citation or the presentation of such work as my own.

DEDICATION

This work is dedicated to my last-born son; Dickson Omany Owoko, who suffered an eye ailment when 10 years old.

ABSTRACT

Glaucoma, a leading cause of irreversible blindness worldwide, is characterized by elevated intraocular pressure (IOP), which damages the optic nerve, impacting both peripheral and central vision. Despite its severity, there is limited information on the prevalence, awareness, and health practices related to glaucoma, particularly within Homa Bay Town Sub-County, Kenya. This study aimed to (1) determine the prevalence of glaucoma, (2) assess awareness levels and associated socio-demographic factors, and (3) examine glaucoma-related practices among adults aged 35 years and above. Anchored in the Health Belief Model, which emphasizes the importance of perceived susceptibility, severity, benefits, and barriers to preventive health actions, this study offers a framework for understanding glaucoma management behaviours in the community. A cross-sectional study design, combining quantitative and qualitative methods, was employed with a sample of 384 participants selected from a population of 117,439 adults using multi-stage probability sampling. Glaucoma status was objectively assessed through clinical ophthalmic examinations, including intraocular pressure and optic nerve evaluations, performed by trained professionals. Data were collected using pretested, semi-structured questionnaires for quantitative responses, while qualitative data were obtained through key informant interviews (KII) with healthcare providers. Quantitative data were analyzed using SPSS v29 at a 95% confidence level, and chi-square tests were applied to assess associations between key variables. Qualitative data were thematically analyzed and presented as narrative summaries. Results revealed a glaucoma prevalence rate of 6.3% among participants, with awareness of glaucoma similarly low at 6.3%. Awareness was significantly associated with gender ($\chi^2 = 12.90$, $p = 0.003$) and marital status ($\chi^2 = 22.34$, $p < 0.0001$). Key practices included limited screening uptake, sporadic treatment adherence, and preventive actions, indicating significant gaps in both knowledge and access to care. These findings underscore the influence of socio-demographic and socioeconomic factors on glaucoma awareness and practices. In conclusion, this study highlights the urgent need for targeted public health interventions to enhance glaucoma awareness, improve access to screening and treatment, and inform policy development in Homa Bay Town Sub-County. The insights derived are intended to guide healthcare providers, policymakers, and scholars in addressing glaucoma-related blindness, particularly in underserved regions.

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ABBREVIATIONS AND ACRONYMS

ACA - Anterior Chamber Angle

FDG- Focused Group Discussion

GLUK - Great Lakes University of Kisumu

IOP - Intraocular Pressure

KIIs Key Informant Interviews

MOE - Ministry of Education

HBM- The Health Belief Model

POAG - Primary Open Angle Glaucoma

SES - Socio-economic status

SSA - Sub Saharan Africa

WHO - World Health Organization

OPERATIONAL DEFINITION OF THE TERMS.

Awareness- is the ability to understand a condition and its basic characteristics.

Glaucoma - is established when there is persistent elevated intraocular pressure of 21 mmHg or moreand it has caused damage to the optic nerve, therefore affecting the peripheral vision and later centralvision permanently.

Knowledge refers to their understanding of any given topic, glaucoma in this case.

No light perception – When there is complete death of the optic nerve and there is total blindnesswith no vision at all.

Ocular hypertension – When the intraocular pressure is more than 21mmHg. But no damage hasoccurred to the optic nerve.

Optic atrophy – When there is death of the optic nerve.

Practice refers to the ways in which they demonstrate their knowledge through their actions.

Screening- refers to the use of simple tests across a healthy population to identify individuals who have ill health but do not yet have symptoms. Screening is an approach that promotes vigilance for signs and symptoms that may be indicative of early disease to facilitate early detection and treatment.

Tunnel vision – When there is complete damage to the peripheral Retina but the central retina is stillnormal so the patient can see a normal visual acuity but much reduced peripheral vision.

CHAPTER ONE
BACKGROUND INFORMATION

1.1. Introduction

This first chapter provides a brief background to the study, emphasizing the importance of determining glaucoma prevalence, awareness, and practices. It highlights the background information, statement of the problem, objectives, research questions, and the significance of the study.

Glaucoma is a state of eye condition which has had persistently raised intraocular pressure (IOP) and the optic nerve has sustained varying degrees of irreversible damage this results in visual loss, starting with peripheral than central vision (Altman, *et al,* 2014). However, Glaucoma occurred in different types, Primary Open-angle glaucoma (POAG), was diagnosed in 3.1%, Angle closer glaucoma (ACG) in 0.59%, and other forms of glaucoma accounted for 0.49%.

Global prevalence: Millions of people worldwide have glaucoma, with estimates suggesting over 3.5% of those aged 40-80 being affected**.** In 2010, the number of people globally with glaucoma was around 60.5 million, and this figure was projected to reach nearly 80 million by 2020 (Wong *et al.*, 2014). Even more recent studies published in 2014 provided even higher estimates, suggesting the number of people with glaucoma would rise to 76 million in 2020 and a staggering 111.8 million by 2040 (Tham *et al*., 2014).

Regional reports indicate that the prevalence of POAG was highest in Africa at 4.2% (Tham et al., 2020). The prevalence is higher in sub-Saharan Africa (SSA), where it is accentuated by low awareness in the region (Whiteside et al., 2013).

The severity of Glaucoma**;** Glaucoma accounts for approximately 15% of global blindness,

with approximately 600,000 people losing their vision each year. (Broman *et al*, 2006). A survey ranked glaucoma as the third leading cause of blindness after cataracts and trachoma as documented in the ocular status survey results from the Kenya Rural Blindness Prevention project at a frequency of 0.6/1000.

Who is affected with, Glaucoma, an important cause of irreversible blindness, is a disease of significant public health importance worldwide, particularly among people of African descent. (McCarty, *et al, 2001).* Glaucoma affects 2.93% of people aged 40 to 80 in Europe (WHO, 2012 [updated 21; cited 10, 2018]. This prevalence was reported to increase with age, reaching 10% in people over 90 years old. Research conducted in Ghana showed a standardized age-specific prevalence of 7.7% (30 years and above) and 8.5% (40 years and above (Altman, *et al, 2014).*

Strategies for addressing glaucoma are Awareness strategies Raising public awareness about the importance of regular eye exams is one of the most effective ways to detect and manage it early. (Destaye et al 2017.)

A participant was considered aware of glaucoma if they answered 'Yes' to the question 'Have you everheard of glaucoma?' and provided at least one response, such as 'glaucoma is high eye pressure', 'glaucoma causes blindness', 'glaucoma causes damage to the eye nerve', blinding eye illness causing eye nerve damage, or eye disease causing vision field loss. Hearing the word glaucoma was not considered as awareness because simply knowing the phrase did not imply awareness of the disease. (BMC Ophthalmology, 2017)

Practices Strategies; Acknowledging standard duration of treatment for glaucoma, assessment of effective drugs for glaucoma currently used per patient, doses missed per week, level of compliance to medication, knowing difficulties faced by glaucoma patients in taking medication, and encouragingpeople to have visual fields and gonioscopy tested frequently.

(Gachago et al 2020)

Moreover, the approach to glaucoma therapy is frequently dictated by the severity of the disease. Eyeswith higher intraocular pressure or more advanced optic nerve damage and /or visual field loss will typically be managed more aggressively than those with lower IOP or earlier stage disease (AmericanAcademy of Ophthalmology).

1.2 : Statement of the problem.

Glaucoma is the leading cause of irreversible blindness worldwide, with 79.6 million blind people in 2020 and 8.4 million in Sub-Saharan Africa (McCarty *et al,* 2001). Glaucoma is the leading cause of blindness, with the majority of cases detected late due to a lack of screening. Low acceptance of screening services could be due to a lack of awareness. Glaucoma also imposes enormous social and economic expenditures on national economies since it affects the working population. (Mathenge *et al,* 2018). There is a scarcity of information on glaucoma prevalence, awareness, and practices, as well as associated factors, in Homabay town subcounty, Homabay County. Despite an increase in glaucoma-related blindness, no empirical studies have been undertaken in Homabay County to investigate glaucoma prevalence, awareness, or practices.

Efforts to improve glaucoma awareness and management have included public awareness campaigns like World Glaucoma Week, which educate communities about the disease and promote regular eye examinations, supported by organizations such as the World Glaucoma Association. Local health initiatives, such as the establishment of the Glaucoma Group in Ethiopia, have focused on community outreach to raise awareness. Integrating glaucoma screening into routine healthcare services and training healthcare providers on risk factors and symptoms are crucial for early detection. Successful innovations include telemedicine for remote consultations, mobile health applications for medication reminders, and training

community health workers to enhance local awareness. However, challenges persist, including low awareness levels, barriers to treatment adherence due to scepticism or financial constraints, and resource limitations in healthcare infrastructure.

Most studies on glaucoma have largely been concentrated around Nairobi and therefore this study shallbe timely since it explores the prevalence in a rural population. According to the County Director of Health Services, unpublished data at the Homabay County Referral Hospital shows that there is an increase in glaucoma in the County, out of the 12 new glaucoma cases that were registered at the Homabay County referral hospital in the past one year, 6 (50%) were blind. This depicts the likelihood

that 50% were diagnosed in the late stages. It is also worth noting that accurate data on glaucoma prevalence, Awareness, and Practices among residents of Homabay Town Sub County are unavailablefor Homabay County due to the lack of a local glaucoma registry. Against this backdrop, this study was undertaken in Homabay Town Sub County of Homabay County as the starting point in determining the prevalence and establishing awareness and practices of glaucoma and the associated factors.

1.3 Objectives of the study

1.3.1. The Broad Objective.

To assess the Prevalence, level of glaucoma awareness and practices among the residents ofHomabay Town Sub County, Homabay County.

1.3.2. The Specific Objectives:

1. To determine the prevalence of Glaucoma among the residents of Homabay Town Sub County,Homabay County.

2. To establish the awareness levels of Glaucoma and the associated factors among the residents ofHomabay Town Sub County, Homabay County.

3. To determine the practices of Glaucoma among the residents of Homabay Town Sub County,Homabay County.

1.4 Research Questions

1. What is the prevalence of Glaucoma among the residents of Homabay Town Sub County, Homabay County?
2. What are the awareness levels of Glaucoma and the associated factors among the residents ofHomabay Town Sub County, Homabay County?
3. What are the practices of Glaucoma among the residents of Homabay Town Sub County,Homabay County?

1.5 Justification of the study

Kenya continues to face low levels of awareness about glaucoma prevention and control strategies among health policymakers, planners, and providers at both the national and county levels of government. (National Guidelines for the Management of Glaucoma, 2020). Establishing the prevalence, awareness, and practices of glaucoma is essential for instituting the prevention and treatment programs that are fundamental for reducing its devastating consequences. Understanding thechallenges in the glaucoma management continuum will help in informing the institution of services and health policies that will help in preventing glaucoma associated blindness. Raising public awareness about glaucoma is critical for early diagnosis and prevention of blindness. However, community awareness of glaucoma is low, making intervention difficult; thus, this study may provideinsights into improving policy guidelines, particularly in the context of Homabay Town Sub County.

The government of Kenya, through the Ministry of Health, has also raised significant concerns regarding glaucoma as a national health issue. (National Guidelines for the

Management of Glaucoma,2020). The National Guidelines for the Management of Glaucoma indicate that glaucoma is the second leading cause of vision loss globally and poses a considerable challenge to eye health professionals inKenya, where approximately 4.3% of individuals over 50 years are affected by the disease (Ministry of Health, 2018). The guidelines emphasize the necessity for early diagnosis and quality care to preventirreversible blindness caused by glaucoma, highlighting that comprehensive glaucoma care is essentialfor improving eye health outcomes in the country (Ministry of Health, 2018). These guidelines were developed with input from various experts and stakeholders, reflecting a commitment to addressing

the burden of glaucoma and integrating eye care into the broader agenda of Universal Health Coverage(UHC) in Kenya (Ministry of Health, 2018). The Ministry's proactive approach underscores the need for ongoing research and adaptation of treatment practices to effectively tackle this growing health concern.

1.5 Study Significance

The study will increase human knowledge on Glaucoma and will enrich glaucoma science and improve quality of life. It will promote innovation and share scientific findingswith the public. The study may provide insights towards the improvement of policy guidelines especially in the context of Homabay County.

CHAPTER TWO:
LITERATURE REVIEW

2.1. Introduction

This chapter reviews both theoretical and empirical literature relevant to the research study to identifygaps emanating from the previous related to be filled by the current study. In this chapter, the existingliterature concerning glaucoma prevalence, awareness, knowledge, and practices are discussed in orderto bring glaucoma into perspective and to understand previous works in this area. It critically examinesthe existing body of knowledge related to the study area. The prevalence and the associated factors, the awareness, knowledge, practices, and the associated factors. The anchoring model i.e. Health BeliefModel and conceptual framework of the study are also illustrated and discussed.

2.2. The prevalence of Glaucoma and the associated factors

The prevalence of glaucoma in the African population is high, with a standardized age-specific prevalence of 7.7% for people aged 30 and up and 8.5% for those over 40. Understanding the various risk factors that contribute to this prevalence is critical for developing effective glaucoma-reduction strategies in Africa. This section will investigate how ocular factors such as increased intraocular pressure (IOP), genetics, demographics, and others influence the prevalence of glaucoma. While the exact cause of primary open-angle glaucoma (POAG) is unknown, several known risk factors interact in complex ways to influence the disease's development and progression. (WHO. 2018).

While many risk factors for primary open-angle glaucoma (POAG) are universal, some are more specific to African patients (Mahmoud et al., 2006), increasing their risk of developing glaucoma andblindness. These unique factors complicate glaucoma management, making it more difficult to detect,diagnose, treat, and follow up with patients. (Trope, *et al,* 2014).

2.2.1 The types and prevalence of Glaucoma

POAG is the most prevalent type of glaucoma worldwide, contributing to between 60 and 94 percent of glaucoma cases. 5% of all glaucoma in the prevalence surveys of the African population (Giorgis et al., 2014; Nallamshetty *et al*., 2009). It is important to note that the incidence of glaucoma in African countries is relatively high, as research indicates that it affects 8% of the population. 2% in western Cameroon, 5. 0%, 0%, and 8% in Nigeria respectively. 5% in Ghana among persons who are 40 years and above (Entekume *et al.,* 2015). More recently still, a survey conducted in Kenya established a glaucoma prevalence rate of 4. 3% in the adult population especially those above 50 years of age (Mathenge *et al*., 2018).

Moreover, qualitative studies have shown that African patients with POAG are diagnosed at a more advanced stage and with faster progression of the disease, which is associated with blindness at the time of diagnosis or shortly thereafter (Lin *et al.,* 2014). The study also examined patients' attitudes and knowledge; the results revealed that most of the participants had little knowledge about glaucomabefore their diagnosis and believed that the symptoms they experienced were normal and expected with age and declining vision.

2.2.2 Influence of ocular factors on raised intraocular pressure (IOP) on prevalence of glaucoma.

Intraocular pressure (IOP) is a significant risk factor for glaucoma development worldwide, with a consistent and strong association seen in various populations (Khanal *et al*., 2013). Furthermore, IOPis the only modifiable factor in glaucoma treatment, making it an important target for management (Kara *et al*., 2015).

Research has shown that IOP levels are generally higher among black populations in South Africa andCanada compared to Caucasians in the same regions. Furthermore, studies have found that patients ofAfrican descent tend to have thinner corneas, which is associated with the development of primary open-angle glaucoma (POAG) (Trope *et al*., 2014).When

interpreting results from retinal nerve fiber layer and optic disc investigations, it is essential to consider the differences between African and Caucasian populations. These variations have been proposed as possible explanations for some of the phenotypic differences observed among different racial groups with glaucoma (Giorgis et al., 2014).

2.2.3 Influence of genetic factors on the prevalence of glaucoma

The role of genetics in glaucoma has been known for quite some time now (Shirbur et al., 2012). First- degree relatives of patients with glaucoma are at a higher risk of developing the disease (Trope et al., 2014) and are typically targeted in screening campaigns. POAG is more common among Saudi individuals with African backgrounds. There are also differences in the incidence between different ethnic groups within Africa. For instance, Igbo and Mongo ethnic groups in Nigeria and Congo respectively have higher prevalence rates, this proves the role of genetics (Giorgis et al., 2014). Furthermore, people with dark skin are more prone to glaucoma. However, recent genetic research has not yet elucidated the involvement of known glaucoma gene polymorphisms in patients of African origin (Onakoya et al., 2014).

2.2.4 Demographic Factors on prevalence of glaucoma

Glaucoma is more common as people get older, regardless of race, and the prevalence of glaucoma is higher in the black population than in the white or Asian population. The prevalence of OAG is higher in all age groups of the black population. (Trope et al., 2014). In Ghana, the prevalence of POAG was 3. 7% among adults aged 40-49 and 14. 5% in the 60s to 14. 7% to 16. 7% between these age groups' outflow facility, and other anatomical predispositions, tend to change with age (Whiteside et al., 2013), potentially contributing to this association, though numerous confounding variables exist. Notably, most long-term cohort studies have been conducted among non-African individuals, leaving a significant gap

in this area. The relationship between POAG and sex has shown inconsistent results in non-African patients, with findings ranging from no association to a preference for either males or females (Buden et al., 201

However, studies among Africans and people of African descent generally indicate a male predominance (Lin *et al*., 2014). Clinic-based studies also showed a general male preponderance, witha ratio of 3:1 reported by Lawan, and prevalence rates of 62% by Abdul et al. in Northern Nigeria, 57% in Southwest Nigeria, 71% in Northern Ghana, and 72% in Tanzania (WHO, 2012). This male predominance may be due to better access to healthcare for males. Additionally, a low body mass index (BMI) has been associated with POAG among patients of African descent in some studies in theUS and Nigeria (Onakoya *et al*., 2014), with lower BMI linked to 60% greater odds of POAG (P = 0.00135).

A glaucoma screening using a cross-sectional descriptive design was conducted in Nchokko village, Izzy Local Government Area, Ebonyi State, Nigeria, among a population of 402 by Ogbonnaya et al.in 2016. The results showed that only 21.1% of respondents were aware of glaucoma, with gender, education, and positive family history significantly associated with awareness. Only 6.3% had good knowledge of the disease. Although a significant proportion of individuals in the rural community hada positive attitude towards glaucoma screening (62.1%), only a small percentage (5%) had actually undergone screening. This suggests that, while people were willing to participate in screenings, there was a lack of awareness and knowledge about glaucoma, emphasizing the importance of education and outreach efforts.

A cross-sectional study conducted by Asteway et al. in 2022 at Butajira General Hospital revealed thatout of 91. Only 1% of the health workers had heard of glaucoma, while 42% had a thorough understanding of the disease. The study also found that health workers who had undergone eye examsand had a family history of glaucoma were about three times more

knowledgeable about the conditionthan those who had not. Another 2018 study by Helen Baker found that 69% of POAG patients had alow socioeconomic status (SES), with an end-stage glaucoma diagnosis being associated with a lowerSES. People with a family history of glaucoma and lower income are less likely to have regular eye exams. This can worsen their condition and reduce their quality of life. Studies show that people withlow income are less likely to get regular eye exams, including dilation, compared to those who are wealthier. Transportation problems were also a major barrier for over a third of patients diagnosed with glaucoma.

Lower educational levels correlate with less glaucoma awareness and poor medication adherence (Asteway *et al*., 2022). This paper aims to examine the relationship between low income and the quality of vision loss among glaucoma patients. Although patients may have the same visual acuity issues, the ones with lower SES will likely report a worse quality of life. It may be because they perform different tasks that require vision every day, or because they have less social support to copewith the condition (Entekume *et al*., 2015). Research revealed that income, education, and health issuesall play a role in how patients experience the VRQOL of patients (Altman *et al*., 2014). Lower-incomeand education were associated with other health issues and overall health status. They also had a lowerquality of life concerning their vision. Notably, education was considered more important than incomein some cultures

2.2.5 Influence of systemic factors on the prevalence of glaucoma

Studies on people of African descent show mixed results for links between glaucoma and health conditions. Some research in Africa (Lin *et al*., 2014) and elsewhere (Thapa *et al*., 2011) suggests connections between high blood pressure (hypertension) and diabetes with glaucoma. However, a study in the UK didn't find a link between glaucoma and high blood pressure (Giorgis *et al.,* 2014). This difference might be due to how studies define and measure these conditions, or because age playsa role.

A cross-sectional study was conducted at the Association Para Evitar la Ceguera in Mexico City by

Alejandra in 2021 to assess and compare knowledge and awareness of glaucoma using a questionnairedeveloped by a group of experts following Delphi panel rules and pre-tested in a pilot. A study of participants, the average age being 61, looked at glaucoma awareness and knowledge. Participants included people with glaucoma (34%), people without glaucoma (38.6%), and relatives of glaucoma patients (27.4%). While more than 73% had heard of glaucoma, knowledge varied greatly. Surprisingly, relatives of glaucoma patients scored the highest in knowledge, while those with no glaucoma in their family scored the lowest. The study discovered that several factors were associatedwith increased glaucoma knowledge: frequent eye exams, higher education levels, and having a familymember with glaucoma.

2.2.6 The influence of other factors on the prevalence of glaucoma

Some habits like smoking have not been found to have a clear relationship with POAG among Black people; while some studies have found a link between smoking and POAG (Thapa et al., 2011), othershave not (Giorgis et al., 2014). Also, a cross-sectional survey of African American women revealed that alcohol use was an independent predictor of POAG. A study conducted in Ghana showed that young patients had a higher risk of blindness; 26% of the participants in the study were young people(WHO, 2012).

Helen Baker's work was carried out in the urban settings of London, United Kingdom in 2018 employing health knowledge questionnaires. These studies revealed that 71-93% of the respondents who were interviewed over the telephone had heard of glaucoma while only 23% of the respondents who were interviewed in a face-to-face manner had heard of glaucoma. In general, the level of awareness and knowledge about glaucoma in the general population in the UK is comparatively high (Berg *et al*., 2011).

A case-control study conducted in Congo revealed that BMI has a poor correlation with OAG with an

OR of 1. 09 [95% CI, 1. 01–1. 18; P = 0. 05] (Thapa, Shrestha, Berg, Khanal, & Koirala, 2013).

Someresearchers have postulated that low BMI people may have low ICP, and therefore, high TPG, which may lead to the development of POAG (Barton et al., 2013). This hypothesis calls for more research,especially among Africans, who are more affected by POAG.

A study conducted in Gondar, Ethiopia assessed the awareness and knowledge of glaucoma among adults greater than 35 years (701 participants, 99. 3% response rate). The group had a nearly even gender split (male to female: 1:1. 6) with a median age of 48 years. Notably, a third and a third (35%)of the participants stated that they had at least one chronic illness. The key findings were: Glaucoma Awareness: A slightly higher percentage of 35. 1% of the respondents reported being aware of glaucoma. Among the respondents who have heard about the disease, 49. 6% of them had good knowledge about the disease. Factors Influencing Awareness: Education level (primary, secondary, college or higher) and prior experience of an eye examination were associated with glaucoma knowledge. On the other hand, awareness was found to be inversely proportional to age, where the 65-74 age group had the least awareness. In conclusion, this study indicates that education and past eye examinations are important predictors of glaucoma knowledge among this group of adults in Gondar,Ethiopia.

The descriptive cross-sectional study by Nkum *et al*. in 2015 examined glaucoma awareness among patients aged 40 years and above at Komfo Anokye Teaching Hospital (KATH). Among the participants, 74% were aware of glaucoma. The study found no significant differences in awareness across various age groups, sex, ethnic groups, or religions ($P>0.05$). However, there were statisticallysignificant differences in awareness based on educational level ($P< 0.001$), with only 27% possessingaccurate knowledge about glaucoma. Higher educational attainment emerged as a crucial factor influencing awareness of glaucoma, supported by existing literature. This trend may be attributed to better health information dissemination and self-directed learning among individuals with higher education levels.

Educated individuals are more likely to prioritize modern medical care over traditional remedies, influencing their awareness levels accordingly. Regular eye examinations also played a significant role in raising awareness among participants. Those attending eye exams are typically exposed to health education programs, which help them familiarize themselves with glaucoma and its implications.

Furthermore, adults with a history of chronic diseases such as diabetes mellitus or hypertension demonstrated higher awareness of glaucoma. This group often undergoes regular eye check-ups as partof their overall health management, contributing to their knowledge of glaucoma. Additionally, better income levels were associated with greater awareness of glaucoma, possibly because individuals withhigher incomes can afford and seek medical attention more readily.

In conclusion, socioeconomic status (SES) affects various aspects of glaucoma diagnosis and management, with reports indicating that lower SES is a risk factor for advanced glaucoma at the timeof diagnosis. Awareness initiatives tailored to educational levels, regular eye exams, and chronic disease management could potentially improve glaucoma outcomes across diverse socioeconomic backgrounds.

Studies on glaucoma prevalence among residents of Homabay Town Sub County had not been conducted. This study therefore provided an opportunity to establish the glaucoma prevalence amongresidents of Homabay Town Sub County

2.3 Awareness levels of glaucoma and the associated factors

In developed countries, only 48% of patients with glaucoma are aware of their condition, and 68% ofpatients have no glaucoma diagnosis. 39% of patients suffer from advanced disease in at least one eye(Thapa SS, Berg RV, Khanal S, *et al.*, 2013). This is especially true in developing countries where glaucoma awareness and knowledge are generally low, with even

lower levels in Sub-Saharan Africa. These are some of the areas that require additional research to close existing gaps. Raising glaucoma awareness has far-reaching implications for early diagnosis, treatment, and control of the diseases of vision loss. Efforts to improve the public's awareness and understanding of glaucoma are essential measures for reducing the effects of this disease. The World Health Organization has also recognizedglaucoma as one of the priorities for the Vision 2020 campaign, which shows that the problem is acknowledged on the international level

According to Alemu *et al.* (2017), education level, previous eye examination, age, sex, occupation, chronic diseases, and ethnicity all have an impact on glaucoma awareness and knowledge. Their research also found that people with primary or secondary education were three times more likely to know about glaucoma than illiterates, and those with a college education or higher were six times morelikely. Furthermore, people with a history of chronic diseases like diabetes or hypertension were 2. 8 times more likely to be aware of glaucoma. Higher income levels were also associated with 4. Higher-income earners were six times more likely to be aware of glaucoma than lower-income earners. Thesefindings therefore call for increased education, frequent checkups, and proper management of chronic diseases to increase the public's knowledge of glaucoma. Low community awareness of glaucoma, combined with a scarcity of specialists, makes early diagnosis and treatment difficult (Berg *et al.*, 2011).

Glaucoma is the fifth leading cause of blindness in Ethiopia, accounting for an estimated 62,000 Ethiopians who have lost their sight permanently. The economic consequences of glaucoma blindness are significant, affecting affected individuals' quality of life, raising healthcare costs, and imposing rehabilitation costs on the blind. These factors put a strain on healthcare systems and government budgets for healthcare. (Dielmans *et al*., 2016).

According to a recent study, 24 percent of people are aware of glaucoma. 4% (95% CI: 21(0), 28. 1(1)), which is lower than studies conducted in Gondar Northwest Ethiopia (35.1%) and Addis Abeba(28. 4%) in Central Ethiopia. This could be because the study participants have varying levels of education. In the Gondar study, only 32% of respondents said they received adequate disease information. Previously, 7% of adults had no formal education, but the most recent study found that 60.2% of adults had no formal education. Previous research has found that educational status is a strongpredictor of glaucoma awareness.

A study in Kumasi, Ghana found that while over half (56%) of people had heard of glaucoma, less than a third (29%) actually understood its symptoms or causes. News sources like TV and radio werethe main sources of information. Interestingly, factors like education, religion, language skills, being male and older age were all linked to higher awareness, with education having the strongest influence.Despite the limited understanding of glaucoma itself, nearly everyone (90%) knew where to go for eyeproblems.

This highlights the need for a similar study in Homabay Town Sub County since currently there is nopublished literature on the levels of glaucoma and its risk factors. Understanding how aware people are of glaucoma and the reasons behind that awareness is crucial. This knowledge can then be used tocreate targeted programs to improve public understanding of glaucoma and encourage earlier diagnosis and treatment. This, in turn, can help reduce glaucoma-related blindness.

The diagnostic tools that can be used in glaucoma include ophthalmoscopy, tonometry, perimetry, and imaging. These tools are used to measure the intraocular pressure and to evaluate the visual field loss,which are important parameters in the diagnosis and management of the disease (Schuster *et al.*, 2020). Management of glaucoma is mainly directed at controlling the intraocular pressure in order to slow down the progression of the disease and

its effects on vision. This is usually done by applying topicalagents, laser treatment, and occasionally surgery (Schuster *et al.*, 2020). Reduction of IOP has been found to be useful in preventing the deterioration of visual field in patients with manifest glaucoma. However, poor compliance to glaucoma medication regimens remains a major problem worldwide

even with the availability of effective treatments. A study that used pharmacy data showed that only10% of patients who were prescribed glaucoma drops were compliant and continued to refill their prescription over one year. Some of the factors that influence medication compliance include patient'sliteracy level whereby physicians are in a better position to educate patients with high literacy levels regarding their glaucoma medications (Juzych *et al.*, 2008). On the other hand, patients with low literacy levels experience challenges in comprehending and accessing their prescribed medications. Insub-Saharan Africa, where patients' compliance to topical glaucoma therapy is particularly low, surgical approaches are often considered as the first-line therapy. This approach seeks to provide a lasting solution to the problem of intraocular pressure in a single visit taking into account the issues ofcompliance and accessibility to health care in the region (Juzych *et al*., 2008). Managing adherence-related challenges and enhancing compliance to consistent glaucoma treatment is vital in controlling the disease and its impact on vision especially in the developing world as sub-Saharan Africa.

Nyakundi *et al*. (2020) for the first time conducted a pilot study to independently evaluate the level ofglaucoma therapy adherence. This study included patients with newly diagnosed open-angle glaucomawho were prescribed a weighed bottle of Lumigan 0. 01% and 98% of them reported that they had received counseling on therapy. Of the 11 patients, 5 (45%) failed to complete a full year of topical therapy. Of the 6 patients who did complete the year, the mean number of drops per eye per day was

1. 74 (SD 0. 69), and their intraocular pressures (IOPs) were controlled at each visit. These patients claimed to have good self-perception of compliance.

However, the study shows that poor compliance,according to the previous literature and the objective assessment in this small-scale study, may mean that medication is not the best first-line intervention in this setting. The results also indicate that patients who come back for

repeat prescriptions and reviews are probably compliant with their prescribed medication regimens. Another study with 169 agents from three centers in Lomé including Sylvanus Olympio University Teaching Hospital, Campus University Teaching Hospital, and Be Hospital offered additional information. Among these agents, 50. 9% were male while 49. 1% female,With an average age of 33. 66 ± 10. 45 years. Of these participants, 46. 10% were doctors and 53%. 90% paramedics. The level of experience of the participants also differed with 58. 60% of them havingat most 5 years of experience and 41. 40% of them having more than 5 years of experience. Regardingthe knowledge about glaucoma, 53. 80% of the agents defined glaucoma as ocular hypertension, while

17. 20% of the participants defined it as an optic nerve disease. Additionally, 46. 20% were unaware that there are different types of glaucoma while 53. Only 20% of the respondents were aware of this fact. A vast majority (92. 30%) of them were aware that glaucoma could cause visual loss. As for attitudes and practices, 91. 70% of the agents believed that follow-up should be done by an ophthalmologist, and 81. 10% considered it necessary to visit a doctor every six months. Finally, 65. 08% said that eye drops should be used for the rest of their lives as part of the treatment. These studiesbring out the difficulties of compliance to glaucoma treatment in an African setting and the need to educate the patient and follow them up closely. At present, no studies have been conducted on glaucoma awareness and associated factors among residents ofHomabay Town Sub County. This study will investigate residents' knowledge and associated factorsin Homabay Town Sub County.

2.4 Practices of Glaucoma and Associated Factors

A study was conducted to assess patients' feelings and experiences with glaucoma. When they were diagnosed with glaucoma, more than half of the participants reported negative emotions, with 34%

fearing losing their vision. Half of the patients had no visual complaints, while 14% reported poor or very poor vision, which was more common in the elderly. Of the patients taking topical medication, 25% reported moderate to severe side effects. About half of the patients who underwent laser or surgery said that their condition was better after the treatment. While nine-tenths of the individuals reported satisfaction with the information and care received, their practices concerning glaucoma were frequently less than comprehensive. A fifth of the participants reported that they had inadequate Knowledge, particularly on the causes, treatment, and outcomes of the disease. The younger patients were more anxious and inquiring and complained of more side effects than the older patients. In general, women reported more dissatisfaction than men. In conclusion, glaucoma diagnosis greatly reduces the patient's quality of life (Nyakundi *et al,* 2020).

2.5 Summary of the Literature Review and Identified Gaps

The literature review provides a comprehensive overview of existing research on glaucoma, focusing on its prevalence, awareness, knowledge, and associated factors, particularly within the African context. The review highlights that glaucoma presents a significant public health challenge, with a notably high prevalence among the African population, where the standardized age-specific prevalence is reported at 7.7% for individuals aged30 and older and 8.5% for those over 40 (WHO, 2018). Understanding the various risk factors contributing to this prevalence is critical for developing effective glaucoma-reduction strategies in Africa. Studies indicate that primary open-angle glaucoma (POAG) is the most common type, accounting for 60% to 94% of glaucoma cases, with varying prevalence rates across different countries (Giorgis *et al*., 2014; Nallamshetty et al., 2009). Factors such as increased intraocular pressure (IOP), genetic predispositions, demographic variables, and systemic health conditions are identified as critical contributors to the development and progression of glaucoma (Trope *et al*., 2014).

Several gaps in the literature on glaucoma have been identified that highlight the need for further research. First, there is a significant lack of studies focusing on the prevalence and awareness of glaucoma in specific regions, such as Homa-Bay Town Sub-County, which this research aims to address. Additionally, existing literature inadequately explores how illiteracy affects awareness and knowledge of glaucoma, particularly in communities with low educational attainment (Alemu et al., 2017). Variability in awareness levels across different demographics also presents a gap, as some studies report high awareness in certain groups, while others do not, indicate a need for more localized research (Berg *et al.*, 2011). Furthermore, although socioeconomic status is recognized as acritical factor influencing glaucoma awareness and management, there is limited exploration of specific socioeconomic barriers, such as transportation and access to healthcare, that affect outcomes in various populations (Dielmans et al., 2016). Most current studies are cross-sectional, which limits understanding of how awareness and knowledge of glaucoma evolve over time, particularly in response to educational interventions (Lin et al., 2014). Lastly, the influence of cultural beliefs and practices on perceptions of glaucoma and its treatment remains underexplored, suggesting a need for qualitative research to gain deeper insights into these factors (Thapa et al., 2011). Addressing these gaps will provide valuable data that can inform public health initiatives and improve glaucoma management strategies in underserved populations.

2.6 Theoretical Framework

The Health Belief Model (HBM) Figure 2. 1 is the most commonly used framework in behavioural research such as examining glaucoma awareness and practices. The HBM is especially useful for studying the behaviors of healthy and non-symptomatic people who engage in both medical and non-medical preventive practices. Created in the early 1950s by

social scientists Stephen Kegels, Godfrey Hochbaum, and Irwin Rosenstock at the U. S. Public Health Service, the model was designed to explain why people did not use preventive measures in diseases or go for early screening tests.

The HBM posits that perceived susceptibility to a disease or health problem and perceived benefits of preventive measures determine the preparedness to act. It indicates that the perceived risk of contracting a disease and the perceived efficacy of the recommended health behavior are the two key factors that determine the likelihood of engaging in that behavior. The HBM postulates that health-related behavior is motivated by the wish to avoid getting sick or to recover if sick and the perceived efficacy of a particular health action in preventing or curing the illness. Finally, the decision to act is based on perceived benefits and perceived barriers to the health behavior.

The Health Belief Model (HBM) provides a theoretical framework at the intrapersonal level, identifying six key concepts that help understand individual behaviors: The six constructs include perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action. The first four constructs were part of the original HBM when it was developed, while the last two were added as the model was refined through research. Self-efficacy is a person's perception of his/her ability to avoid getting a certain disease or illness and perceived severity is the extent to which an individual perceives a disease or illness as serious. In the case of glaucoma, knowledge of risk and the implications that come with it determine the probability of people attendingglaucoma screening services.

Perceived susceptibility refers to the perceived risk of contracting an illness or the perceived threat of not treating the illness. This perception also differs from one person to another and encompasses both thephysical outcomes which may include death or disability and the social outcomes which may involvefamily life and interpersonal relationships. Some of the reasons

given for low participation rates in screening programs include a lack of appreciation of the dangers of glaucoma.

In Simpler terms, people are more likely to follow health advice if they think it will work. They balancethe perceived susceptibility of getting an illness against the perceived benefit of feeling better. If the benefits appear to be obvious, then they are more inclined to act.

Likewise, perceived barriers refer to the perceived challenges of an individual in performing a recommended health action and are made up of several factors that influence this perception. These are feelings of obstacles or hindrances which result in a cost/benefit consideration. People balance the efficacy of the actions against the possible negative consequences, including the cost, side effects, and discomfort because of pain, time, or inconvenience. Awareness of these factors can account for why people with negative attitudes including embarrassment, and lack of interest, fear screening.

Perception of pain or danger, lack of time, feeling healthy, concern over the procedure, and discomfortmay be less willing to participate in the screening programs.

It is common for people to misinterpret the results of the screening and think that an abnormal result will lead to blindness. Prompts are the triggers for the decision-making process to take the recommended health action. These cues can be self-generated, for example, when one notices that heor she has developed a problem with blurred vision, or received from other people, a relative has fallenill, read articles in a newspaper or specific treatment. Self-efficacy is defined as the extent of confidence that a person has in his/her capacity to execute a behavior, which is a central component ofmany behavioral theories because it determines whether a person will perform the behavior.

However, the HBM has limitations. It does not wholly capture context-specific factors that

are important in explaining the connection between belief concepts, motives, intentions, and individual behavior. It also presupposes that cues to action are present and that health actions are the ultimate objective in decision-making. These shortcomings have been addressed in the following sections using a conceptual framework that includes emotional and socio-environmental factors that may explain whypeople make decisions to participate in screening programs, which the HBM sometimes overlooks (Rosenstock *et al.*,

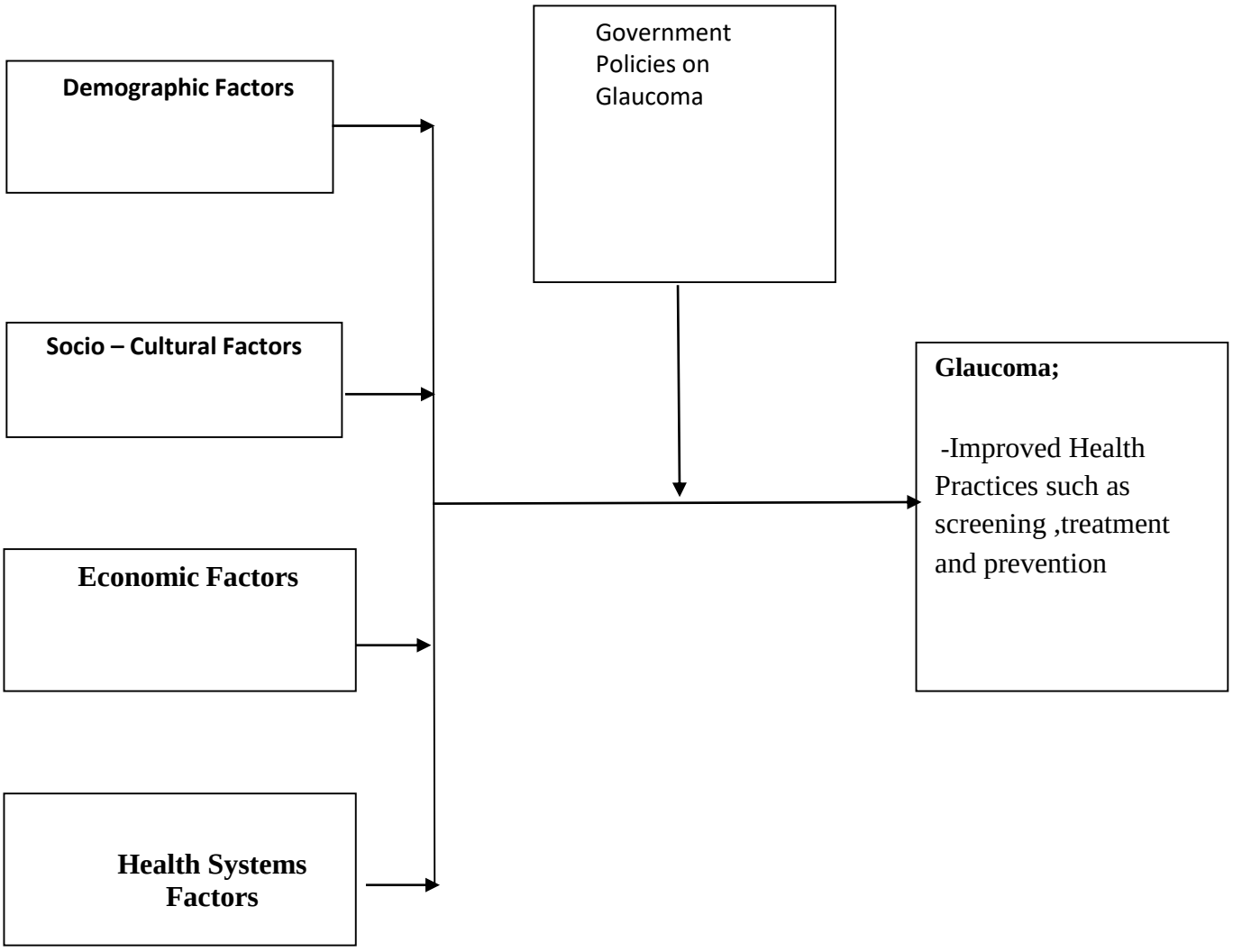

Figure 2.1: Conceptual Framework

2.7 Conceptual Framework.

This study's conceptual framework has been displayed in Figure 2.2 below. In this study, the

outcomes are the prevalence of glaucoma, awareness, knowledge, and practices and as such the dependent variables, whereas demographic, sociocultural, economic, and Health system factors as thebackground factors are the independent factors. It is postulated that independent factors- demographics, social, economic, and health each work independently to impact on prevalence of glaucoma, awareness, knowledge, and practices of glaucoma. The Government policies on glaucoma have a moderating effect on the dependent variable.

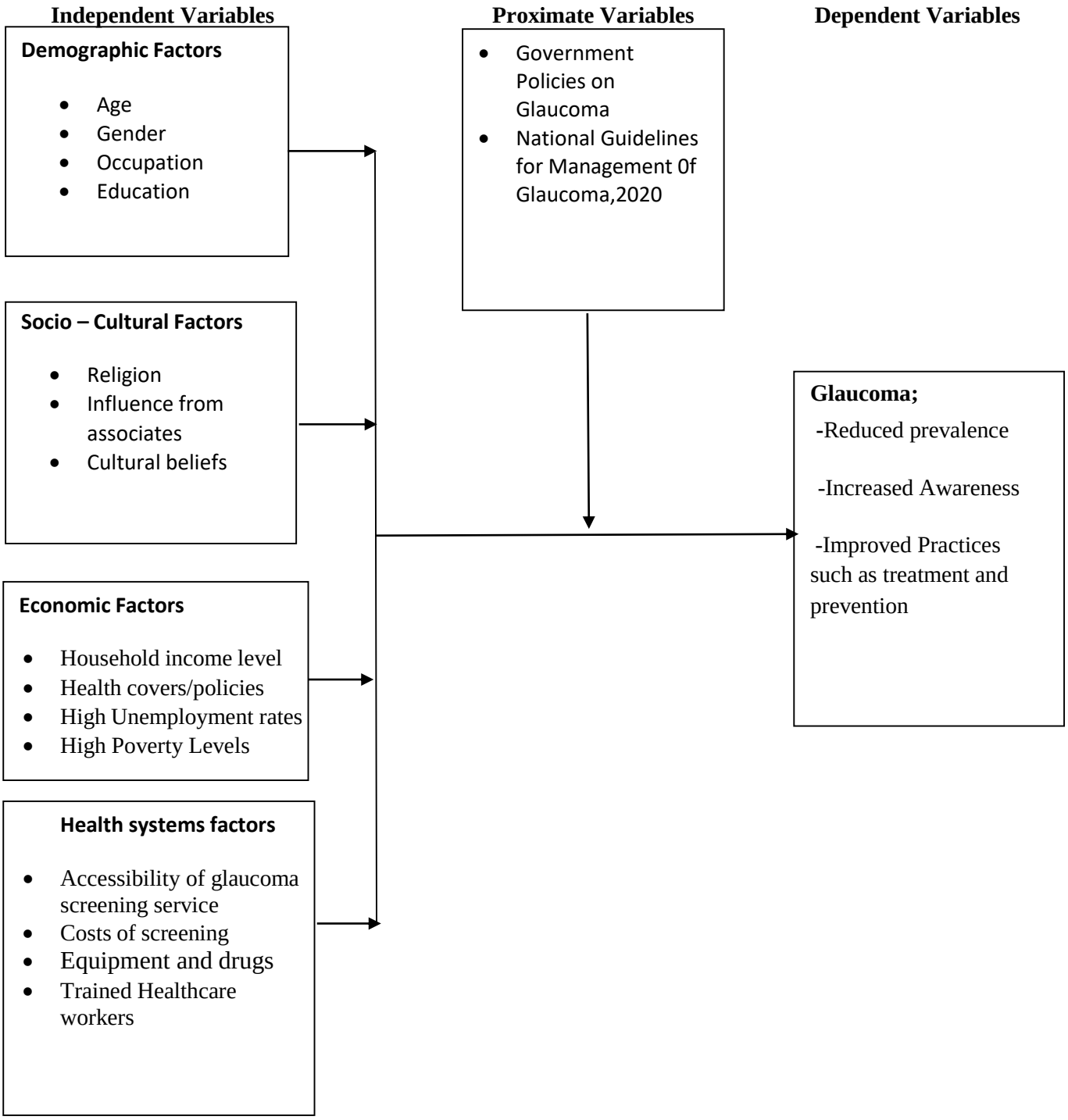

Figure 2.2: Operational Framework

CHAPTER THREE

METHODOLOGY

3.1. Introduction

This chapter describes the study area, study population, sample size estimation, study design, sampling procedures, data collection instruments, validity and reliability of the instruments, analysis techniques and presentation, study limitations as well as ethical considerations. This section therefore provides a detailed description of how the required data was obtained, processed, analyzed, and interpreted and how the findings will be disseminated to fulfil the study objectives.

3.2. Study Area

The study area was Homabay Town Sub County, Homabay County. (Appendix I). Homabay Townsub-county has a total area of 645 Sq. Km. it has four County Assembly Wards namely, Central, Arujo,East and West wards.

3.2.1. Study Population

Homabay Town Sub County has an estimated population of 117,439 people with a fertility rate of 3.9%. (Homabay County Integrated Development Plan 2018-2022). Population distribution by Wards is as follows as illustrated in Table 3.1:

Table 3. 1: Population distribution of Homabay Sub County by the wards

Central Ward	16,679
Arujo Ward	28,101
East Ward	50,204
West Ward	22,455
Total	117,439

Source: CBS, Homabay County Integrated Development Plan 2018-2022.

3.2.2. Socio-economic background

The poverty levels stand at 74%, which is one of the highest in the region. There are various and different types of businesses depending on structures determined by various factors among them the number of members in that particular business, scale of operations, capital requirements, degree of control and management, degree of risk and liability, stability of the business, the flexibility of the administration, and division of profit, cost, procedure, and government regulations The sub-county exhibit unbalanced physical and social infrastructural facilities such as roads, electricity, water, and other social amenities. Most access roads are in a state of disrepair and are accessible with difficulties during the rainy season. The economic activities in the area include sugarcane, cotton, rice, fishing, groundnuts, maize, millet, and other business activities.

3.2.3. Health services

Homabay Town sub-county is served by; Homabay County Referral Hospital and 12 other public health facilities, 8 Private hospitals, and 4 Faith-based hospitals. All these health facilities are within or within the proximity to the sub-county. There are 685 health workers. Immunization coverage is 46.7% while family planning acceptance rate is 65.8% (HBCIDP, 2018-2022).

3.2.3. Epidemiological trends

The top five killer diseases among under-fives in the location are malaria, respiratory tract infections, diarrhea, measles and malnutrition. Malaria is holo- endemic and its prevalence rate is 152 per 1000 population. Disease outbreaks such as cholera, typhoid, and dysentery are prevalent in the location due to poor environmental sanitation and lack of safe drinking water. The HIV/AIDS scourge is alarming in Homabay Town Sub County (HBCIDP, 2018-2022).

3.3. Study Design.

The study adopted an analytical cross-sectional design. This design allows for the simultaneous collection of data on both the prevalence of glaucoma and the awareness and practices surrounding it among adults aged 35 years and older in Homa Bay Town Sub-County. The cross-sectional approach is particularly suitable for this research as it facilitates the assessment of various factors at a single point in time, enabling me to identify associations between socio-demographic variables and glaucoma awareness. The study employed both quantitative and qualitative methods, the study gathered comprehensive data that informs the understanding of glaucoma within the community. Quantitative data were collected through structured questionnaires. Qualitative data were obtained through key informant interviews with healthcare providers. This mixed-methods approach enhances the robustness of the findings and allows for a more refined interpretation of the results. Utilizing this design aligns with established methodologies in similar studies, as noted by Mugenda and Mugenda (2003), which emphasize the importance of gathering and analyzing data to inform health interventions effectively.

3.4. Target Population

The target population for this study consisted of adult residents aged 35 years and above of Homabay Town Sub County

3.5 Sample Size Estimation

The sample size was determined from the target population of all the residents above 35 years, which in this case was above 10,000. Fisher's *et al* (1999) formula was used in sample size estimation ɒget a representative sample size given that it is ideal for the community health nature of the study as shown below. Fisher's formula is appropriate since the population here is over 10,000 persons (i.e.) 117,439 persons(Homabay CIDP 2018-22).

A confidence level of 95% was assumed.

$$n = \frac{z^2 pq}{d^2}$$

Where:

- *n* = the desired sample size
- *Z* = the Z-score, corresponding to the desired confidence level (1.96 for 95% confidence level)
- *p* = the estimated proportion of the population with the characteristic of interest (if unknown, 0.5 is often used as it provides the maximum sample size)
- q= 1 - *p* (the proportion without the characteristic of interest) the proportion in the sample population not expected to have been screened
- d= the desired margin of error or level of precision (0.05 for ±5% precision)

The sample size was calculated as follows:

$$n = \frac{(1.96)^2 (0.5) (0.5)}{(0.05)^2} = 384.16$$

A total of 384 respondents were enrolled in the study

3.6 Sampling Procedure

This study employed a combination of both probability and non-probability sampling techniques to effectively capture data on glaucoma prevalence, awareness, and practices among adults aged 35 years and older in Homa Bay Town Sub-County. Given that Homa Bay County comprises eight sub-counties, Homa Bay Town Sub-County was selected purposively due to its unique blend of both rural and urban communities. This sub-county is further divided into four County Assembly Wards: Central, Arujo, East, and West.

Ward Selection

Central and Arujo Wards were chosen through purposive sampling because they encompass a mix of rural and urban populations, which is distinct from East and West Wards that are

predominantly rural. This selection ensures a diverse representation of community characteristics relevant to the study.

Village Selection

To facilitate data collection, simple random sampling (rotary method) was utilized to select one village from each of the two selected wards (Central and Arujo). Within these villages, households were randomly chosen for participation in the study. From each selected household, one individual aged 35 years and above was randomly selected to take part in the research.

Sample Size Determination

The sample size for the study was determined using Probability Proportional to Size (PPS) sampling. This method involved calculating the proportion of eligible respondents in each ward relative to the total number of eligible respondents in Homa Bay Town Sub-County. The formula used for this calculation is as follows:

$\boldsymbol{n_i}$ $\frac{\boldsymbol{Ni}}{\boldsymbol{N}}$ x N as shown in the formula below

Where:

- *ni* = number of eligible respondents in Ward i*i*
- *Ni* = total eligible respondents in Ward i*i*
- *N* = total eligible respondents in Homa Bay Town Sub-County
- 384 = desired total sample size for the study

Table 3.2: Sampling Frame showing the number of eligible respondents to be sampled in the villages and households in the two wards

Ward Name	**No. of eligible persons (over 35years)**	**Villages sample size≥50 %**	**Householdssample size**
Central Ward	1,835	1835/4926x 384 =143	Participants were identified from eligible households in the selected villages using the PPS
Arujo Ward	3,091	3091/4926 x384 =241	Participants were identified from eligible in the households selected villages using the PPS
Total	**4,926**	**384**	**384**

This approach ensures that the sample size from each ward is proportionate to its population, thereby enhancing the representativeness of the findings

Table 3.2: Sampling Frame showing the number of eligible respondents to be sampled in the villages andhouseholds in the two wards

3.7. Inclusion Criteria

The Study included Homabay Town sub-county residents aged above 35 years. The study focuses on adults aged 35 years and above because glaucoma is known to have a higher prevalence in older populations, particularly among individuals over 40 years of age. Research indicates that the risk of developing glaucoma increases significantly with age, making it crucial to target this demographic for effective screening and intervention (Tham *et al*., 2020). Additionally, starting the study at age 35 allows for the inclusion of individuals who may already exhibit early signs of the disease, as some forms of glaucoma can develop silently over many years before symptoms appear. Respondents were limited to those who gave informed consent and must have stayed for more than six months in Homabay Town Sub County.

3.8. Exclusion Criteria

Those excluded from the study were Homabay Town Sub County residents that are 35 years of age and above that qualify to be in the study but due to the following conditions they were excluded:

Individuals with diagnosed mental health disorders or severe cognitive impairments will be excluded. This criterion is essential to ensure that all participants can provide informed consent and engage meaningfully in the study, as cognitive limitations may hinder their understanding of the study's purpose and procedures (American Psychological Association, 2020). Residents who have medical conditions that could impede their participation in the study will also be excluded. This includes individuals with acute or chronic health issues that may affect their ability to complete surveys or undergo clinical assessments related to glaucoma. Ensuring that participants are in a suitable health condition is critical for obtaining reliable data and maintaining ethical standards in research (WHO, 2016). These exclusion criteria were informed by both ethical considerations and scientific rationale.

3.9. Validity and Reliability of Instruments for Data Collection

3.9.1 Validity of the Instruments

Validity quantifies the degree to which findings from data analysis accurately reflect the phenomenon being studied and assesses the significance and correctness of conclusions drawn from the data (Mugenda and Mugenda, 2003). The degree to which the study instruments measured what they were designed to measure is known as validity. In any type of research, the validity of the instruments is crucial, and the degree of validity that is deemed acceptable depends on the researcher's professionalism, experience, and logical thinking. Supervisors from the Department of Community Health, Great Lakes University of Kisumu inspected the research tools. To ensure instrument validity with a high degree of accuracy, the content selected and included in data collection tools was confirmed to be relevant to the variables under study and capable of answering the study objectives appropriately.

The sampling tools were pre-tested in a pilot study on 38 respondents from East Ward in Homa Bay Town sub-county but not participating in the study to ensure the accuracy of the instruments, clarity of words and questions and to detect and correct any biases. Necessary changes were made in the sampling tools before final administration. Content validity was determined by evaluating test items against the test specifications, drawn up through a thorough examination of the subject domain to ensure that it covers a representative sample of the items to be measured.

3.9.2 Reliability of the instrument

Reliability refers to the consistency of a research procedure or instrument (Mugenda & Mugenda, 2003). It therefore refers to the degree of consistency demonstrated in a study. The researcher maintained a high level of reliability by designing questions in the questionnaire in simple language

that respondents could understand. Users of the instruments also received clear instructions. This was accompanied by side notes to help respondents understand the requirements and provide accurate responses. The interactive approach to administering the questionnaire during data collection enabled the researcher to elaborate and clarify questions to elicit reliable responses.

To formally assess the reliability of the data collection instrument, a test-retest methodology was implemented. This involved administering the semi-structured questionnaires twice to a pilot group drawn from East Ward in Homa Bay Town Sub-County, with an interval of two weeks between administrations. The pilot group comprised 10% of the sample population, ensuring that those selected were not included in the main study. The results from this pilot study were analyzed using Cronbach's alpha, a statistical measure that evaluates internal consistency. Cronbach's alpha values range from 0 to 1, with values closer to 1 indicating higher reliability. In this study, a score of 0.7, considered ideal for establishing reliability, was obtained (Nunnally, 1978).

3.9.3. Pilot Study

A pilot study was conducted in East Ward, a ward within Homa Bay Town Sub-County that did not participate in the main study. This pilot involved 38 participants, representing 10% of the intended study population (Mugenda & Mugenda, 2003). The primary objective of this pilot study was to identify and address potential issues with the data collection instruments, such as vagueness or insensitivity of certain items. During the pilot study, participants provided feedback on their understanding of the questions and any difficulties they encountered while responding. This feedback was crucial for refining the questionnaire to enhance clarity and relevance. The responses were analyzed qualitatively and quantitatively to assess common themes and areas needing improvement. Adjustments were made based on this analysis before proceeding with the actual data collection.

The test-retest methodology and pilot study served complementary purposes within this research framework. While both approaches aimed to enhance reliability, they focused on different aspects: Pilot Study: Primarily aimed at identifying vague or insensitive items in the questionnaire and gathering qualitative feedback from participants about their experiences with the instrument. Test-Retest Methodology: Focused on measuring the stability and consistency of responses over time by administering the same instrument to a subset of participants on two separate occasions.

Together, these methodologies ensured that the final data collection instruments were both reliable and valid for capturing accurate information about glaucoma prevalence, awareness, and practices among adults aged 35 years and older in Homa Bay Town Sub-County. By integrating findings from both

assessments, the researcher was able to refine instruments effectively and enhance overall data quality for the main study.

3.9.4 Data Collection and Procedure

Data collection tools translate the research objectives into specific questions which will evoke responses useful in providing data for achieving the research objectives (Mugenda and Mugenda, 2003). Both primary and secondary data were collected using both qualitative and quantitative data collection methods. The Researcher with the help of two trained research assistants collected data.The research assistants were trained in the administration and filling of questionnaires (Appendix III). The questionnaires were administered by the interviewers. The data collection process was done in two weeks.

Glaucoma prevalence was established through comprehensive ophthalmic examination,including visual acuity, visual fields, intraocular pressure, and independent grading of optic nerve images, was performed. Glaucoma prevalence and associated factors were reported using the International Society for Geographical and Epidemiological Ophthalmology (ISGEO) criteria.

Awareness was measured when a participant responded "yes" to the question "Have you ever heardof glaucoma?" and selected at least one answer from the alternatives that explained the condition in terms of risks and symptoms such as;"glaucoma is high eye pressure," "glaucoma is high eye pressure causing blindness," "glaucoma causes damage to the eye nerve," "blinding eye disease causing eye nerve damage, eye disease causing visualfield loss," or similar responses when asked. Hearing the term "glaucoma" was not be considered awareness in this study because simply knowing the term did not imply knowledge of the disease. (Appendix v)

3.10. Quantitative Data Collection

Quantitative approaches entailed the use of interviewer-administered semi-structured questionnaires (Appendix III) as proposed by Mugenda and Mugenda, 2003 to the respondents. Questionnaires were used because of their low costs, ensure anonymity, permit the use of standardized questions with uniform procedures, and also provide the respondents with time to think through their responses and are easy to score (Kothari, 2004).

3.10.1. Questionnaire

It is an instrument designed specifically to elicit information useful for analysis. These are mainly

survey research tools. This study used questionnaires to collect quantitative data from eligible participants in the Homa Bay Town sub-county. The questionnaire was divided into two sections: one for demographic information about respondents and one for information based on the objective's thematic areas: prevalence of glaucoma in Homa Bay Town sub-County, awareness of glaucoma and associated factors, and knowledge and practices of glaucoma among residents of Homa Bay Town sub-county. This instrument was administered to the study's respondents directly by research assistants.

3.10.2. Qualitative Data Collection

Qualitative data collection in this study was conducted through Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs). The Key Informant the included ophthalmologists, nurses specializing in eye care, and public health officials who possess specialized knowledge about glaucoma care and management in the region. FGDs provided rich insights into the experiences, beliefs, and practices related to glaucoma among residents of Homa Bay Town Sub-County. The KIIs utilized semi-structured guides (see Appendix IV) to facilitate in-depth discussions with key informants from relevant departments at Homa Bay County Referral Hospital. These informants were purposively sampled to include healthcare professionals such as ophthalmologists, nurses, and public health officials who possess specialized knowledge about glaucoma care and management in the region.

The KIIs were conducted face-to-face, allowing for personal interactions that encouraged open dialogue. Each interview lasted approximately 30 to 60 minutes and was audio-recorded with the consent of participants to ensure accurate data capture. The semi-structured format of the interviews allowed for flexibility in questioning while ensuring that all relevant topics were covered. Questions focused on participants' perceptions of glaucoma prevalence, community awareness levels, barriers to screening and treatment, and recommendations for improving glaucoma care.

Following the interviews, the audio recordings were transcribed verbatim, and thematic analysis was employed to identify common themes and insights from the discussions. This method facilitated a deeper understanding of the contextual factors influencing glaucoma management in Homa Bay.

In addition to KIIs, FGDs were incorporated into the research design to enrich qualitative data collection. These discussions involved small groups of 6-10 participants who shared their experiences and perspectives on glaucoma. Each FGD was guided by a skilled moderator who ensured that discussions remained focused while encouraging open dialogue among participants. The moderator utilized a structured guide that included questions about participants' knowledge of glaucoma, their

health-seeking behaviors, and community perceptions regarding eye health.

Participants for the FGDs were selected through purposive sampling to ensure representation from diverse demographic backgrounds within Homa Bay Town. This approach allowed for a variety of perspectives to be shared during discussions. The group format facilitated interaction among participants, revealing shared knowledge as well as differing opinions about glaucoma management. This dynamic helped uncover community beliefs and cultural factors that may influence health behaviors related to glaucoma.

The FGDs were recorded and transcribed, followed by thematic analysis to extract key themes related to community awareness, barriers to care, and suggested interventions for improving glaucoma services. The combination of KIIs and FGDs provided a comprehensive qualitative dataset that enriched the overall findings of this study. By capturing diverse perspectives from both healthcare providers and community members, the research highlights critical insights into the challenges faced in glaucoma awareness and management in Homa Bay Town Sub-County. This qualitative approach complements quantitative data by providing context and depth, ultimately informing targeted public health interventions aimed at improving glaucoma care in the region.

3.10.4. Interview schedule Guide

This is a guide containing quizzes that a researcher was used to collect qualitative data from the informants. This study used unstructured or informal interview based on open ended questions (Kothari, 2009). Three In-depth interview schedule guides were used to elicit detailed

Qualitative data from the key informants from the Homa Bay County Referral Hospital.

3.10.5. Procedure for Data Analysis

Data analysis is the process of modelling, adjusting, and transforming data in order to highlight important information, draw conclusions, and support decision-making (Kothari, 2009). This study used descriptive statistics to analyze quantitative data and NVIVO Software for thematic content analysis of qualitative data. Data analysis procedures for each of the objectives have been outlined in Table

Table 3.3. Data Analysis by Specific Objectives

Objectives	**Study Variables**	**Analysis technique**
1.To determine the prevalence of Glaucoma and associated factors among the residentsof Homabay Town Sub County, Homabay County	**Independent** ▪ Age ▪ Marital status ▪ Education ▪ Occupation ▪ Religion ▪ Level of education ▪ Level of householdincome ▪ Source of income **Dependen**t ▪ Glaucoma prevalence	▪ Descriptive statistics including percentages and proportions have been used. ▪ A Chi-square test of association has been performed to establish a statistical association between the independent variables and the dependent variable (Glaucoma prevalence). Statistical significance at $\alpha \leq 0.05$. ▪ Qualitative data touching on any of these factors have been analyzed thematically and presented verbatim alongside the quantitative results.
2. To establish the awareness levels of Glaucoma and the associated factors among the residents of HomabayTown Sub County, Homabay County	**Independent** ▪ Age ▪ Marital status ▪ Education ▪ Occupation ▪ Religion ▪ Level of education ▪ Level of householdincome ▪ Source of income **Dependent** ▪ Level of awarenessof glaucoma	▪ Frequencies and descriptions have been used to summarize the results. ▪ The Chi square test has been conducted to establish associations between dependent and the independent variables at statistical significance of $\alpha \leq 0.05$. ▪ Qualitative data have been analyzed thematically and presented as verbatim alongside the quantitative results.

3. To establish the knowledge and practices about Glaucoma and associated factors among the residents of HomabaySub County, Homabay County	**Independent** ▪ health systems ▪ Age ▪ Marital status ▪ Education ▪ Occupation ▪ Religion ▪ Level of education ▪ Level of householdincome ▪ Source of income **Dependent** ▪ Screening for glaucoma ▪ Prevention activities ▪ Treatment	▪ Proportions used to summarize the results. ▪ Chi square test to establish associations between dependent and independent variables. Statistical significance evaluated at $\alpha \leq 0.05$. ▪ Qualitative data analyzed thematically and presented as verbatim alongside the quantitative results.

Quantitative data collected using the questionnaires was checked for completeness, and consistency, cleaned and coded, entered, and analyzed using SPSS version 29. Both descriptive and inferential statistics were used. For descriptive statistics, tables, means and charts have been used to summarize the results. For inferential statistics, a chi-square test of the association has been conducted to establish the association between dependent and independent variables at $\alpha = 0.05$ (95% confidence interval). Qualitative data collected from the interviews with key informants have been organized into categories and then subjected to manual content thematic analysis and themes developed have been presented as verbatim (thematic summarization and categorization

3.11. Ethical Considerations

Ethical considerations of a study ensure that the study addresses issues of the respondent's confidentiality, anonymity avoidance of physical or psychological harm, and avoidance of deception. (Mugenda and Mugenda, 2003). The researcher observed the principles and ethical related considerations as stated by (Bell, 2007) this included:

Ethical Approval: Approval to carry out this study was sought and obtained from the Great Lake University of Kisumu (GLUK) Scientific and Ethical Review Committee (GLUSRC) and secured a

permit from the National Commission for Science, Technology and Innovation (NACOSTI). The Permission to conduct the study in Homa Bay Town Sub County was sought from the Department of Health in the County Government of Homabay. Permission was also sought and obtained from the administrative leaders of the wards and villages involved as well as Hospital administrations of the health facilities from where key informants were recruited.

Voluntary Participation: Participation in the study was entirely voluntary. Participants were informed that their decision to participate or not will not affect their access to medical care or any other services. The recruitment process emphasized that there was no obligation to participate and that declining participation had no negative consequences.

Informed Consent: The Study obtained informed written consent or a thumbprint if the participant is unable to write. From participants before the administration of the research questionnaire and before the interviews with key informants. The researchers provided clear and comprehensive information about the study's purpose, procedures, risks, and benefits in a language that participants easily understood. Participants were informed of their right to withdraw from the study at any time without penalty.

Informed Consent for Illiterate Participants: The researcher provided detailed verbal explanations of the study's purpose, procedures, potential risks and benefits. The determination of illiteracy was assessed through a simple screening question asking participants if they could read and write in their native language. This objective assessment ensured that those unable to comprehend written information were appropriately accommodated in the consent process This was done in a language and manner accessible and understandable to participants. The researcher encouraged questions and provided clarifications to ensure that they fully comprehended what participation entailed. For consent from illiterate participants, the researcher included the use of a witness signature. Participants were asked to provide a thumbprint or signature.

3.11.1. Confidentiality and Anonymity

To maintain anonymity, each participant was assigned a unique identification number, which was used in place of personal identifiers throughout the data collection and analysis processes. This approach ensured that individual responses could not be linked back to specific participants. Participants' confidentiality and privacy were protected throughout the study. All data collected have been kept

secure and accessible only to authorized personnel. Participants' identities have been kept confidential. Confidentiality was maintained by the use of non-identifiable data formats. Also, the information recorded in voice has been used strictly for research purposes only. Study data have been stored in password-protected computers or lockable cabinets only to be accessible by authorized researchers. Data have been analyzed and reported in formats that don't allow identification of the individual participant. They have been guaranteed that all data gathered from them are coded to protect their identity and privacy.

3.11.2. Equitable Selection of Participants

Participants have been selected in a fair and equitable manner, without discrimination based on race, gender, socioeconomic status, or other factors. The sampling strategy ensures that the study population is representative of the target population. The respondents were screened for eligibility and those who met the inclusion criteria were informed, explained to, and requested to sign the consent form. Participants were free to join the study or not. If they decided to join, they were also free to change their mind and stop their participation in the study at any time for any reason. There were no penalties for such and this will be clarified in the consent process. Those who were diagnosed with glaucoma were referred to specialized treatment at the Homa Bay County Referral Hospital.

3.11.3. The Stopping rule for the study and for individuals

The stop rule for this study was designed to outline the conditions under which the study can be halted prematurely to ensure the safety and well-being of participants and the integrity of the Study.

This includes serious adverse events experienced by participants, ranging from physical harm to psychological distress. Any ethical violations that compromise participant rights, dignity, or safety would have also triggered a halt to the study. This may have encompassed breaches of confidentiality, coercion, or failure to obtain informed consent. Data integrity is paramount and the discovery of significant issues like data tampering, falsification, or unrecoverable data loss would necessitate termination. Additionally, if participant enrollment could have fallen short of the minimum required sample size of 384 within the designated timeframe, the study could have been stopped.

Finally, the study adhered to the directives of the Great Lakes University's Ethics Committee, NACOSTI, or any other regulatory body overseeing the research. These allowed for study termination in case changes in regulations, emerging ethical concerns, or unforeseen administrative reasons

The stop rule for participants outlines the conditions under which individual participants may be withdrawn from the study to protect their well-being and ensure ethical conduct. To ensure the well-

being of all participants and the integrity of the research. Participants have the ultimate right to withdraw from the study at any time, for any reason, and without penalty. This right was clearly communicated during the informed consent process. Additionally, withdrawal may be necessary in certain situations. This includes experiencing adverse events (physical, psychological, or emotional harm) related to the study procedures. If a participant encounters personal circumstances, such as relocation or illness, that prevent them from continuing with the study procedures, withdrawal will also be required. Finally, the principal investigator, in consultation with the research team and potentially the ethics committee, may make the discretionary decision to withdraw a participant if it is deemed to be in the participant's best interest for health and safety reasons.

3.11.4. Risk-Benefit Assessment and Mitigation Strategies

This section outlines the Risk-Benefit Assessment and Mitigation Strategies for potential risks associated with the proposed study on glaucoma prevalence, awareness, and practices among residents of Homabay Town Sub-County. Identifying and minimizing potential risks was crucial in conducting an ethical and successful research study The following measures were considered:

Risks to Participants and Mitigation Strategies

Physical risks: The study did not involve direct medical interventions, but participants were allowed to express concerns about their eye health during the study. ***Mitigation***: Researchers were trained and prepared to provide referrals or assistance whenever needed.

Psychological risks: Participants may experience stress or anxiety when answering questions about their health or eye condition. ***Mitigation:*** Researchers were sensitive to participants' emotional state and provided support whenever necessary.

Social risks: Participants may face stigma or discrimination if their glaucoma status is revealed. ***Mitigation****:* Strict confidentiality measures were in place to protect participants' privacy.

Economic Risks: During studies, participants may lose income due to time spent participating in the study and participants might incur travel costs or loss of work time. These risks were low in severity but could be moderate in duration. ***Mitigation:*** To minimize economic burdens, the study was designed to be as convenient as possible for participants. Where feasible, data collection sites were located close to participants' homes or workplaces. Participants were informed about the voluntary nature of the study and that participation will not entail significant costs.

Legal Risks: There is minimal legal risks involved, primarily related to data privacy. The likelihood is low, with potentially severe consequences if data breaches occur. ***Mitigation:*** The study has

implemented robust data protection measures, including secure storage of data, restricted access and anonymization of personal information. Participants were informed about their rights under data protection laws.

Risks to Research Team and Mitigation Strategies

Potential biases: Researchers were aware of their own biases and take steps to minimize their influence on the study. ***Mitigation*** using standardized data collection methods and blinding data analysts

Emotional risks: Conducting interviews about sensitive health topics can be emotionally taxing for the researcher and the team. ***Mitigation***: Providing support and debriefing sessions for the research team was important and was done regularly.

Safety risks: Researchers conducting fieldwork prioritized their own safety and followed local safety protocols.

Institutional Risks and Mitigation Strategies

Reputational risks: The study could potentially uncover sensitive information about the prevalence of poor management of glaucoma in the region. ***Mitigation***: Researchers were trained and prepared to handle such information responsibly and ethically.

Financial risks: The study required significant resources for data collection and analysis. ***Mitigation:*** Careful budgeting and resource allocation are necessary to ensure the study's feasibility and sustainability.

Community Risks and Mitigation Strategies

Stigma and discrimination: The study findings could potentially contribute to stigma or discrimination against individuals with glaucoma in the community. ***Mitigation***: Researchers were trained to be mindful of this risk and work to promote understanding and support.

Unrealistic expectations: Participants may have high expectations for the study's impact on their own health or the community's access to eye care. ***Mitigation****:* Researchers were transparent about the study's goals and limitations.

Cultural Sensitivities: The study might unintentionally offend cultural norms or sensitivities, leading to social backlash or decreased participation. ***Mitigation:*** Cultural considerations were integrated into the study design. The research team received training on cultural competence and local community leaders were consulted to ensure the cultural appropriateness of the study methods and materials.

3.11.5. Potential Benefits

Participants in the study stood to gain several potential benefits, including increased awareness and

understanding of glaucoma, which encompasses its risk factors, symptoms and prevention strategies. This enhanced knowledge may lead to improved personal health practices and facilitate early detection of the condition. Additionally, the study's findings have provided valuable insights into the prevalence and awareness of glaucoma in Homa-Bay Town Sub-County, informing public health initiatives and policies aimed at enhancing eye health and preventing glaucoma-related blindness within the community. Furthermore, the research will contribute to the scientific understanding of glaucoma prevalence and awareness, particularly in the African context where such data is scarce, thereby guiding future research and health interventions. Participants also felt empowered by their involvement in research which had the potential to benefit their community, fostering a sense of urgency in addressing glaucoma-related health issues. Finally, the study may have identified individuals at risk of glaucoma who were unaware of their condition, leading to referrals for further medical evaluation and treatment, ultimately helping to prevent vision loss.

3.12. Study limitations

These are the characteristics of design or methodology which may impact or influence the interpretation of the findings from this research. In this context, they may include the refusal to divulge information by some respondents.

Triangulation was used to ensure the credibility of the data collected. It will also be limited by the non-availability of literature on locally conducted glaucoma research works. To this effect, related literature from other jurisdictions was collected to give a clearer perspective of the dynamics. The study being cross-sectional may not infer causality and to this limitation, there was a recommendation that a longitudinal study may be carried out to ascertain causality. This study is being conducted on a small scale therefore the findings will have some limitations in such a way that they may not be generalized at a national level.

3.13. Plan for dissemination of the study findings

Dissemination refers to the process of sharing the research findings with the stakeholders and other audiences to aid the consumption of the findings for sustainability. The results shall be disseminated through publication in two international journals. The findings generated at the end of the research were shared for use by stakeholders such as MOH at both County and National levels that in turn will help in guiding in revision of policies.

These findings will be disseminated through various avenues such as seminars, workshops, conferences and through policy briefs for decision makers and presentations to the local community groups and other stakeholders in two workshops. Instructions on glaucoma prevention through flyer distribution, newspaper advertisements, radio advertisements and publicity shall also be undertaken to reach out tothe communities in Homabay Town Sub County.

CHAPTER FOUR

RESULTS

4.1 Introduction

This study aimed to assess the Prevalence, and level of glaucoma awareness and practices among the residents of Homabay Town Sub County, Homabay County. Specifically, the study sought to determine the prevalence of Glaucoma; establish the awareness levels of Glaucoma and the associated factors; and to determine the practices of Glaucoma among adults aged 35 and above. This was a analytical cross-sectional study design using both quantitative and qualitative approaches to data management. This chapter presents the study response rate of the participants and the socio-demographic and socio-economic characteristics of the respondents. Inferential and descriptive statistics have been used to analyze the data on study variables. Further, the chapter presents the statistical analysis in response to the research questions aimed at determining

the relationship between the dependent variables and the independent variables. Bivariate analysis is presented in the form of a chi-square. This chapter then presents the results under thematic sub-sections in relation to the study's objectives.

4.2 Participants' Characteristics

4.2.1 The Study Response Rate

The study achieved a remarkable response rate of 100% for the required sample size of 384 participants. This high response rate reflects the effectiveness of the recruitment strategies employed and the willingness of the community to engage with the research. Detailed findings regarding participant demographics

4.2.2 Demographic Characteristics of the Study Population

The demographic analysis of participants revealed a diverse age distribution among respondents, with ages ranging from 35 years and above. The majority of participants fell within the 56-65 years age group, comprising 119 individuals (31%), followed by those aged 46-55 years at 95 individuals (24.7%), and 35-45 years at 90 individuals (23.3%). In terms of gender, a significant majority of respondents were female, accounting for 264 individuals (68.7%). Additionally, marital status indicated that most participants were married, with 215 individuals (56.0%) reporting this status (see Table 4.2). This demographic data is crucial for understanding the population's characteristics and their potential influence on glaucoma awareness and practices within Homa Bay Town Sub-County. The predominance of older adults in the study aligns with existing literature that highlights increased glaucoma risk in this age group, while the gender distribution may provide insights into health-seeking behaviors and access to care.

Table 4. 1 Demographic Characteristics of the Participants (N = 384)

Characteristic	N=384 n	%
Age Group (Years)		
35-45	90	23.3
46--55	95	24.7
56-65	119	31.0
66 and above	80	21.0
Gender		
Males	120	31.3
Females	264	68.7
Marital Status		
Married	215	56.0
Single	145	38.0
Divorced/widowed	24	6.0

4.2.3 Socio-economic Characteristics of the Participants

Of the participants 150 (39.1%) reported Primary level of education and a similar number 150 (39.1%) reported secondary level of education as the highest level of education they had attained. Self-employment was the main source of income for most; 150 (39.1%) of the participants, A

majority; 210 (52.2%) of the participants reported having a household income of 10,000 to 20,000 Kenyan Shillings (KES). Table 4.2

Table 4. 2 Socioeconomic Features of the Participants

Characteristic	Frequency (n)	Percent (%)
Education		
No Schooling	55	14.3
Primary	150	39.1
Secondary	150	39.1
Tertiary (College/University)	29	7.5
Source of Income		
Farming	114	29.7
Self-employment	150	39.1
Formal Employment	120	31.3
Household Income		
10,000 to 20,000	130	34.0
21,000 to 30,000	120	31.0
>30,000	134	35.0

4.3 Prevalence of Glaucoma amongst the Study Participants

Glaucoma prevalence was established through comprehensive ophthalmic examination including visual acuity, visual fields, intraocular pressure and independent grading of optic nerve images. The study reported a glaucoma prevalence rate of 24 (6.3 %) among those who had different tests. These are depicted in Table 4.7

Table 4.3: Prevalence of Glaucoma among Participants

Glaucoma positive	n=384 n	Percent (%)
Yes	24	6.3.
No	360	93.7

In the qualitative aspects, the participants, during the KIIs were also asked for their opinion on how different types of glaucoma tests may influence determination of the prevalence uptake. The following was the view of

the County Director for Health Services: "*Generally, there is lack of awareness of glaucoma amongst residents of Homa Bay Town Sub County and therefore determination of the prevalence is not easy. For examination of the eyes, a less invasive procedure that is affordable attracted more clients and resulted in more accurate prevalence levels of glaucoma* "

4.3.1 Association between Demographic Factors and Prevalence of Glaucoma

A chi-square test was performed to establish the association between demographic factors and prevalence of glaucoma at $\alpha \leq 0.05$ in the study. As shown in age ($\chi^2 = 20.79$, $p = 0.0001$, gender ($\chi^2 = 14.90$, $p = 0.005$, marital status ($\chi^2 = 22.34$, $p = 0.075$) (Table 4.8)

Table 4.4 The association Between Demographic Factors and Prevalence of Glaucoma

		Prevalence of glaucoma			
Demographic Factors	**Total n (%)**	**Yes (%)**	**Not present (%)**	**(χ2)**	**p-value**
Age					
35-45	90(23.3)	2(0.5.)	88(22.9.0)	20.79	<0.0001
46-55	95 (24.7)	5 (1.3)	90 (23.4)		
56-65	119 (31)	7 (1.8)	112(29.2)		
66 and above	80 (21)	10 (2.6)	70 (18.2)		
Gender					
Male	120 (31.3)	106 (23.3)	14.90	0.005	
Female	264 (68.7)	264 (68.7)	10 (2.6)	254 (54.7)	
Marital Status					
Married	215 (56)	10 (3.9)	205 (52.1)	22.34	0.075
Single	145 (38)	6 (8.7)	139 (22.1)		
Divorced/widowed	24 (6)	8 (2.3)	16 (3.9)		

In addition, it was further noted that the residents have inadequate information regarding the benefits and procedures of glaucoma screening and this may be a limitation towards determination of the actual prevalence. In the FGD 3, a participant stated that lack of information about the symptoms of glaucoma and availability of screening services and its benefits could lead to non-participation in the screening

program. *"Lack of information about glaucoma screening services, where to go for screening, risk and benefits of glaucoma screening and symptoms of glaucoma are hindrances to participation in glaucoma screening exercises. I have not been screened because I do not know about the existence of glaucoma screening.*

4.3.2 Socio-Economic Factors and prevalence of glaucoma

Chi-square test was performed to establish association between socio-economic factors and the prevalence of glaucoma at $\alpha \leq 0.05$ during this study. All the socio-economic factors showed no significant association with prevalence of glaucoma follows: education level ($\chi^2 = 0.386$, $p = 0.943$) source of income ($\chi^2 = 1.431$, $p = 0.489$)) and household income ($\chi^2 = 2.494$, $p = 0.228$) (Table 4.9).

Table 4.5 Association Between the Socio-Economic Factors and Glaucoma Prevalence

N=384

	Prevalence of glaucoma			**chi-square**	**p-value**
	Total n (%)	**Yes n (%)**	**Not present (%)**	**(χ2)**	
Highest Level of Education					
No School	55 (14.3)	5 (1.3)	50 (13)	0.386	0.943
Primary	150 (39.1)	5(1.3)	145 (37.8)		
Secondary	150 (39.1)	7 (1.8)	143 (31.3)		
Tertiary	29 (7.5)	7 (1.8)	22(0.00)		
Income Source					
Farming	114 (29.7)	14 (3.6)	100 (26.1)	1.431	0.489
Self-Employed	150 (39.1)	30 (7.8)	120 (31.3)		
Formal Employment	120 (31.1)	40 (10.4)	80(20.7)		
Household income level					

10000-20000	130 (33.9)	10 (2.6)	120 (31.3)	2.49	0.228
21000-30000	120 (31.9)	40 (10.4)	80 (20.7)		
>30000	134 (34.8)	34 (8.7)	100 (26.1)		

4.4 Awareness of Glaucoma amongst participants

In this study, awareness of glaucoma was measured by a criterion which involved the participants having to respond "YES" to the question "have you ever heard glaucoma" and thereafter able to correctly state at least one symptom and any one of the risk factors of glaucoma (Table 4.4).

In this study, some 34 (8.9%) had heard glaucoma. Out of this number, only 29 (7.5 %)) were able to correctly state at least one symptom while 26(6.8%) aware of at least one of the risk factors of glaucoma. However, only 24 (6.3 %) were aware and were able to correctly mention at least one symptom and one risk of glaucoma

In FGD 1, a participant stated "*I know that risks of glaucoma increase with advancing ages."* Additionally, during FGD 2, most of the participants stated that they did not know the risk factors for glaucoma "*we do not know the risks of glaucoma".* On the KII results, the following was the view of the Medical Superintendent for Homa Bay County Referral Hospital: *Very few persons are aware glaucoma amongst the residents of Homa Bay Town Sub County and therefore the more efforts are required to drive awareness*. Cumulatively, only 24 (6.3 %) were aware and were able to correctly mention at least one symptom and one risk of glaucoma. It is equally worth noting that the qualitative data gathered using both the KII schedules and FGDs, Homa Bay Town Sub County residents reported similarly low awareness of glaucoma.

Table 4.6 A Summary of Responses to The Attributes of Awareness of Glaucoma

		(%) of respondents who correctly answered five questions	(%) of respondents who incorrectly answered questions
	Heard of glaucoma?	34 (8.9%)	350(91.1%)
1.	Able to correctly state at least one symptom	29(7.5 %)	355(92.5.0%)
2.	Are you aware of any the risk factors of glaucoma if yes, state at least one	26(6.8%)	358(93.2%)
3.	Cumulative awareness of glaucoma	24 (6.3%)	357(92.9%)

4.4.1: The Association between Demographic Factors and awareness of glaucoma

Among the demographic factors; there was a statistically significant association between age and awareness of glaucoma of $\chi 2 = 28.56$ $p<0.0001$. Results also indicate that there is a statistically significant association between gender and awareness of glaucoma at $\chi 2 = 12.90$ p 0. 003. Similarly, there is a statistically significant association between marital status and awareness of glaucoma at $\chi 2 = 22.34$ $p<0.0001$ (Table 4.5)

Table 4.7 The Association Between Socio-Demographic Factors and Awareness of Glaucoma

N=384					
		Awareness about glaucoma		**chi-square**	**p-value**
	Total n (%)	**Aware n (%)**	**Not Aware n (%)**	**($\chi 2$)**	
Age					
35-45	90(23.3)	15(3.9)	75(19.5)	28.56	<0.0001
46-55	95 (24.7)	10 (2.6)	85 (22.1)		
56-65	119 (31)	39 (10.2)	80 (21)		
66 and above	80 (21)	20 (5.2)	60 (15.6)		
Sex					
Male	120 (31.3)	30 (8)	90 (23.3)	12.90	0.003
Female	264 (68.7)	54 (14.1)	210 (54.7)		

Marital Status					
Married	215 (56)	15 (3.9)	200 (52.1)	22.34	0.000
Single	145 (38)	60 (15.6)	85 (22.1)		
Divorced/widowed	24 (6)	9 (2.3)	15 (3.9)		

4.4.2 Association between Socio-Economic Factors and Glaucoma awareness

The study did observe statistically significant associations between socio-economic factors; highest level of education (χ^2 = 115.54, p = 0.001) source of income (χ^2 = 15.67, p = 0.004) and household income (χ^2 = 25.48, p = 0.0004). (Table 4.6).

Table 4.8 Association between the Socio-economic Factors and Glaucoma Awareness

N=384					
	Awareness about glaucoma			**chi-square**	**p-value**
	Total n (%)	**Aware n (%)**	**Not Aware n (%)**	**(χ2)**	
Highest Level of Education					
No School	55 (14.3)	5 (1.3)	50 (13)	115.54	0.001
Primary	150 (39.1)	20(5.2)	130 (33.9)		
Secondary	150 (39.1)	30 (7.8)	120 (31.3)		
Tertiary	29 (7.5)	29 (7.5)	0 (0.00)		
Income Source					
Farming	114 (29.7)	14 (3.6)	100 (26.1)	15.67	0.0004
Self-Employed	150 (39.1)	30 (7.8)	120 (31.3)		
Formal Employment	120 (31.1)	40 (10.4)	80(20.7)		
Household income level					
10000-20000	130 (33.9)	10 (2.6)	120 (31.3)	25.48	0.0001
21000-30000	120 (31.9)	40 (10.4)	80 (20.7)		
>30000	134 (34.8)	34 (8.7)	100 (26.1)		

4.5 Glaucoma practices in Homa Bay Town Sub County

The respondents were asked to state whether they have tried any mechanisms to control glaucoma. The respondents were able to mention screening, treatment and prevention as the main practices that they undertake in the Homa Bay Sub County. They reported as having done glaucoma screening at 20(5.2%). Prevention practices were at 10(2.6%). Those who were involved in glaucoma treatment using various therapies were at 24(6.3%) The results are as shown in Table 4.10.

Table 4.9: Glaucoma practices among the residents of Homa Bay Sub County

Variable	Category	Frequency and proportion
Ever involved in glaucoma practices	Yes	24(6.3%)
	No	360 (93.7%)
Practices used	Screening	20(5.2%)
	Prevention	10(2.6%)
	Treatment	24(6.3%)

4.5.1The Association between This study also seeks to ascertain the influence of economic factors on the prevalence of glaucoma, awareness, knowledge, and practices demographic factors and the Uptake of glaucoma Screening

In regards to practices, both age and marital status showed statistically significant relationships with the uptake of glaucoma screening ($\chi2 = 28.56$, $p = 0.001$) and ($\chi2 = 30.00$, $p = 0.003$) respectively while gender did not show a statistically significant relationship ($\chi2 = 3.46$, $p = 0.0614$). This result shows a highly significant association between marital status and the uptake of glaucoma screening ($p < 0.05$. Table 4.11

Table 4.10; The Association Between the Participants' Demographic Factors and The Uptake Of Glaucoma Screening

N=384	Uptake of glaucoma screening			chi-square	p-value
	Total n (%)	Yes n (%)	No n (%)	(χ2)	
Age					
35-45	90 (23.3)	0 (0.0)	85 (22.1)	28.56	0.0001
46-55	95 (24.7)	1(2.6)	85 (22.1)		
55-65	119 (31.2)	6 (7.5)	90 (23.3)		
66>	80 (21)	11 (6.7)	55 (14.3)		
Sex					
Male	120 (31.3)	25(6.7)	95 (45.5)	3.43	0.064
Female	264 (68.7)	34 (1.0)	230(53.2)		
Marital Status					
Married	215 (56)	45 (1.0)	170(84.1)	30.00	0.0003
Single	145 (38)	5 (0.3)	140 (8.7)		
Divorced	24 (6)	9 (0.0)	15 (5.9)		

4.5.2 Socio-Economic Factors and Uptake of glaucoma Screening

Level of education showed a statistically association with glaucoma screening uptake at (χ2)115.54, p=0.00001. This study also indicated a significant association between income source and glaucoma screening uptake, at chi-(χ2) 12.72, P= 0. 0017.The study further reported a significant association between household income and glaucoma screening uptake, at (χ2) 19.80, P= 0. 0000.These extremely small p-values indicate a very strong association between the variables namely; level of education, household income, income source and the uptake of glaucoma screening (Table 4.12)

Table 4.11: Association Between Socio-Economic Factors and Uptake of Glaucoma Screening

N=384	Uptake of glaucoma screening				
	Total n (%)	**Yes n (%)**	**No n (%)**	**(χ2)**	**p-value**
Highest Level of Education					
No School	55 (14.3)	4 (0.3)	51 (32.0)	115.54	0.00001
Primary	150 (39.1)	5 (0.5)	145 (33.3)		
Secondary	150 (39.1)	30 (0.3)	120 (18.6)		
Tertiary	29 (7.5)	20 (0.3)	9 (14.6)		
Income Source					
Farming	114 (29.7)	14 (3.6)	100 (26.1)	12.72	0.0017
Self-Employed	150 (39.1)	15 (4)	135 (35.1)		
Formal Employment	120 (31.1)	30 (7.8)	90 (23.3)		
Household Income					
10000-20000	130 (33.9)	9 (2.3)	121 (31.6)	19.80	0.0000
21000-30000	120 (31.3)	15 (4)	105 (27.3)		
>30000	134 (34.8)	35 (9.1)	99 (25.7)		

4.5.3 The Association between the participants Socio-demographic factors and the prevention/treatment of glaucoma

The results from the study indicate a significant association between age and glaucoma prevention at (χ2) 21.44, P= 0.0017. This suggests that age plays a critical role in whether individuals take preventive measures for glaucoma. Older individuals (55-65 and 66+) seem more likely to engage in prevention, as seen from the higher percentages of "Yes" responses in these age groups. The (χ2) value of 21.44 6.72 with a p-value of 0.0000 shows a statistically significant relationship between age and seeking glaucoma treatment. Individuals aged 55-65 and 66+ still show higher engagement in treatment compared to younger age groups. Both the (χ2) values for prevention (χ2) 1.86, p =0.173, and treatment (χ2) (1.86, p =0.173, indicate no significant association between gender and the uptake of glaucoma prevention or treatment. This means that gender does not play a major role in whether participants engage in glaucoma-related health actions. The (χ2) value of ((χ2) 12.84, p= 0.0016 indicates a significant association between marital status and glaucoma prevention. (Table

4.13)

Table 4.12 The Association Between the Prevention/Treatment Of Glaucoma And The Demographic Factors

N=384	Prevention/Treatment of glaucoma			Chi square	p-value
	Total n (%)	Yes n (%)	No n (%)	(χ2)	
Prevention					
Age					
35-45	90 (23.3)	0 (0.0)	90 (23.3)	21.44	0.0000
46-55	95 (24.7)	5(1.4)	90 (23.3)		
55-65	119 (31.2)	15 (4)	104 (27.2)		
66>	80 (21)	15 (4)	65 (17)		
Gender					
Male	120 (31.3)	15 (4)	105 (27.3)	1.86	0.173
Female	264 (68.7)	20 (5.2)	244 (63.5)		
Marital Status					
Married	215 (56)	15 (4)	200 (52)	12.84	0.0016
Single	145 (38)	13 (3.4)	132 (34.6)		
Divorced	24 (6)	7 (1.8)	17 (4.2)		
Treatment					
Age					
35-45	90 (23.3)	5 (1.3)	85 (22)	6.72	3 0.082
46-55	95 (24.7)	7(1.8)	88 (22.9)		
55-65	119 (31.2)	10 (2.6)	109 (28.6)		
66>	80 (21)	13 (3.4)	67 (20.6)		
Gender					
Male	120 (31.3)	15 (4.0)	105 (27.3)	1.86	1 0.173
Female	264 (68.7)	20 (5.2)	244(63.5)		
Marital Status					
Married	215 (56)	15 (4.0)	200(84.1)	12.84	2 0.0016
Single	145 (38)	13 (3.4)	132 (34.6)		
Divorced	24 (6)	7 (1.8)	17 (4.2)		

4.5.4 The Association between Socio-economic Factors and Prevention/Treatment of Glaucoma

There is a significant association between education level and both prevention and treatment of glaucoma ($\chi^2 = 45.87$, $p < 0.05$), indicating that higher education correlates with greater uptake of glaucoma prevention and treatment. Similarly, there is a significant relationship exists between income

source and glaucoma prevention/treatment ($\chi^2 = 18.12$, $p = 0.002$). Individuals in formal employment are more likely to engage in both prevention and treatment. The study also found out that there is a significant association between household income and both prevention ($\chi^2 = 15.68$, $p = 0.001$) and treatment ($\chi^2 = 15.69$, $p = 0.001$) of glaucoma, with higher income levels linked to higher uptake of glaucoma-related health behavior.

The ($\chi 2$) value of 45.87 and p-value of less than 0.05 indicate a significant association between education level and both glaucoma prevention and treatment. Participants with higher education (tertiary level) show a greater likelihood of engaging in both preventive measures and treatment. Those with no formal schooling or only primary education show the lowest levels of engagement. This finding suggests that education plays a vital role in health literacy and the ability to seek out preventive and curative care for glaucoma. Higher education may also correlate with better access to healthcare resources.

Table 4.13: Socio-economic Factors and Prevention/Treatment of Glaucoma (N=384)

Socio-economic Factors	**Total n (%)**	**Yes n (%)**	**No n (%)**	**chi-square(χ^2)**	**df**	**p-value**
1.Prevention						
Highest Level of Education				45.87	2	<0.05
No School	55 (14.3%)	1 (0.3%)	54 (32.0%)			
Primary	150 (39.1%)	5 (0.5%)	145 (33.3%)			
Secondary	150 (39.1%)	10 (0.3%)	140 (18.6%)			
Tertiary	29 (7.5%)	19 (0.3%)	10 (14.6%)			
Income Source				18.12	2	0.002
Farming	114 (29.7%)	0 (0.0%)	114 (29.7%)			
Self-Employed	150 (39.1%)	10 (2.6%)	140 (35.1%)			
Formal Employment	120 (31.1%)	25 (7.8%)	95 (23.3%)			
Household Income				15.68	3	0.001
10,000-20,000	130 (33.9%)	0 (0.0%)	130 (33.9%)			
21,000-30,000	120 (31.3%)	10 (2.6%)	110 (27.3%)			

>30,000	134 (34.8%)	25 (9.1%)	99 (25.7%)			
2.Treatment						
Highest Level of Education				45.87	2	<0.05
No School	55 (14.3%)	1 (0.3%)	54 (32.0%)			
Primary	150 (39.1%)	6 (1.6%)	144 (37.5%)			
Secondary	150 (39.1%)	10 (2.6%)	140 (36.5%)			
Tertiary	29 (7.5%)	18 (4.7%)	11 (2.8%)			
Income Source				18.12	2	0.002
Farming	114 (29.7%)	0 (0.0%)	114 (29.7%)			
Self-Employed	150 (39.1%)	15 (4.0%)	135 (35.1%)			
Formal Employment	120 (31.1%)	20 (5.2%)	100 (25.9%)			
Household Income				15.69	3	0.001
10,000-20,000	130 (33.9%)	1 (0.3%)	129 (33.6%)			
21,000-30,000	120 (31.3%)	10 (2.6%)	110 (28.7%)			
>30,000	134 (34.8%)	24 (6.1%)	110 (28.7%)			

The chi-square value of 18.12 and a p-value of 0.002 indicate a significant association between income source and both prevention and treatment of glaucoma. Participants with formal employment are significantly more likely to take preventive measures and seek treatment, while those involved in farming have the lowest engagement. This suggests that people with stable and formal income sources may have better access to healthcare, either through insurance or disposable income. They may also have more health awareness or workplace benefits that encourage health screenings and treatments.

The chi-square value of 15.68 for prevention and 15.69 for treatment, both with a p-value of 0.001, show a significant relationship between household income and glaucoma care behaviors. Participants with higher household incomes (>30,000) are more likely to engage in both prevention and treatment compared to those with lower household incomes (10,000-20,000).

Table 4.14: Socio-economic Factors and Prevention/Treatment of Glaucoma (N=384)

This table summarizes the association between socio-economic factors and the uptake of glaucoma prevention and treatment, based on chi-square tests.

CHAPTER FIVE
DISCUSSION

5.1. Introduction

This chapter presents discussions and opinions about the study results as well as the findings of others who have investigated related topics. Concurrences to the previous studies highlighted. Similarly, the differences between the findings of this study and the previous research are highlighted. Broadly, the study assessed the glaucoma prevalence, awareness and practices among residents of Homa Bay Town Sub County

Specifically, the study: determined the prevalence of glaucoma: assessed the awareness of glaucoma; and assessed the practices of glaucoma by the residents of Homa Bay Town Sub County.

This was a cross-sectional study that adopted both quantitative and qualitative approaches to data management and was community-based in Homa-Bay Town Sub County. From the population of 117,439 adults aged 35 years and above, some 384 participants were obtained using Fisher's Equation since the population is over 10,000 and recruited randomly through Probability Proportional to Sample using the multi-stage sampling.

In conclusion, the findings of this study suggest that research studies anchored on HBM can be a fundamental cog in establishing the awareness, prevalence and practices of glaucoma amongst residents of Homa Bay Town Sub County in Homa Bay County, Kenya.

Earlier studies reported that glaucoma prevalence was on the increase in Kenya but awareness, prevalence and practices remain poor. These outcomes have now been replicated in the findings of this study. The thematic discussions and opinions of the results are presented in the subsequent sections in line with the study objectives.

5.2 Prevalence of glaucoma among residents of Homabay Sub County

The study determined that the prevalence of glaucoma among residents aged 35 years and above in Homa Bay Town is 6.3%, with only 24 participants diagnosed with the condition. This finding is significant as it provides the first insight into glaucoma prevalence from a rural Kenyan perspective. The qualitative data gathered through focus group discussions (FGDs) and key informant interviews (KIIs) echoed this low prevalence rate. These results align with previous studies indicating that while glaucoma is prevalent in African populations—reporting standardized age-specific prevalence rates of 7.7% for those aged 30 and above and 8.5% for individuals over 40 (Kibera et al., 2020)—the specific rates can vary significantly by region. For instance, a study in Ghana reported a prevalence of 3.7% among adults aged 40-49 years (Whiteside et al., 2013). The consistency of these findings suggests

that while national averages may indicate higher rates, local factors such as healthcare access and cultural beliefs significantly influence reported prevalence. The observed low prevalence in Homa Bay may be attributed to poor healthcare infrastructure and health-seeking behaviors among residents. Many individuals over 35 years old exhibit limited interaction with healthcare personnel due to traditional beliefs favoring herbal remedies over conventional medical advice (Omondi et al., 2019). As noted by KIIs, discussions about glaucoma are not common within the community, further stifling awareness and early detection efforts.

5.3 The awareness of Glaucoma by residents of Homabay Town Sub County

Cumulatively, only 24 participants (6.3%) were aware of glaucoma and could correctly identify at least one symptom or risk factor associated with the disease. This figure closely mirrors the approximately 4.3% awareness level reported by the Kenyan National Glaucoma Control Strategies in 2020, reaffirming that awareness about glaucoma remains dismal in low- and middle-income countries (LMICs). The lack of awareness has been identified as a barrier to accessing glaucoma services, particularly in areas lacking organized screening programs (ACS, 2011).Reports from the Homa Bay County Director of Health Services noted that the Ministry of Health has not implemented conventional sensitization programs aimed at increasing awareness about glaucoma among residents, resulting in persistently low levels of awareness. Previous research has identified barriers to awareness as including insufficient knowledge about glaucoma coupled with inaccessible or unaffordable screening facilities (Kim & Caprioli, 2018). Qualitative findings from FGDs align with a study by Katz et al. (2018), which revealed that glaucoma is not prioritized by health policymakers in many sub-Saharan African countries.According to KII reports, context-specific strategies should be developed to enhance participation in glaucoma management programs for Homa Bay residents. This argument is corroborated by NGMG (2020), which states that advocacy for glaucoma has not been prioritized by Kenya's Ministry of Health. The KIIs indicated that different types of glaucoma tests might influence awareness levels; less invasive procedures tend to attract higher compliance rates.Age was found to significantly impact awareness levels regarding glaucoma among participants in Homa Bay Sub-County, supporting findings from other studies advocating for individuals over age 50 to begin regular screenings (Durand et al., 2020). The lack of awareness has been suggested as a barrier to accessing screening and treatment services (ACS, 2011). In contrast, an American study reported that 79% of respondents had undergone glaucoma screening (Kim & Caprioli, 2018), likely due to greater availability and affordability of screening services.

5.4 The Practice of Glaucoma in Homabay Town Sub County –

The study revealed that only 6% of participants had engaged in glaucoma-related practices, which included 5% for screening, 3% for prevention, and 6% for treatment. These low engagement rates highlight significant barriers to effective glaucoma management in Homa Bay Town Sub-County. Key socio-demographic factors such as age and marital status, along with socio-economic factors like education level and household income, were found to significantly influence these practices. In resource-constrained settings like Homa Bay, the healthcare system is often ill-prepared for opportunistic screening. This situation contrasts sharply with findings from more developed countries where screening methods are more accessible and affordable (Kibera et al., 2020). For instance, a systematic review indicated that individuals in high-income countries have greater access to regular eye examinations compared to their counterparts in low-income regions (Durand et al., 2021).The impact of age on glaucoma practices was particularly pronounced in this study. This finding aligns with previous research advocating for individuals over **50 years** to begin regular glaucoma screenings (Durand et al., 2021). As age increases, so does the risk of developing glaucoma, necessitating proactive health measures. However, lower-income groups often face significant barriers such as high costs, lack of insurance, and limited access to healthcare facilities, which hinder their participation in preventive and treatment programs (Mathenge et al., 2018).

Socio-Economic Disparities

Education emerged as a critical determinant in both the prevention and treatment of glaucoma. Public health interventions should prioritize increasing awareness and education, particularly among populations with lower educational attainment. Research indicates that individuals with higher education levels are more likely to engage in health-seeking behaviors (Kibera et al., 2020). Additionally, income sources and household income significantly influence the uptake of glaucoma prevention and treatment services. Strategies aimed at improving healthcare access for low-income populations should include affordable screenings, subsidized treatments, and targeted educational

campaigns. The findings underscore socio-economic disparities in glaucoma care. Lower education and income levels correlate with reduced healthcare engagement, indicating a pressing need for targeted interventions to address these inequalities (Omondi et al., 2019). For example, community-based programs that provide free or subsidized eye care services could significantly increase participation rates among economically disadvantaged groups.

Marital Status and Health Practices

Marital status also played a significant role in determining engagement with glaucoma practices. Married individuals were more likely to participate in preventive actions compared to single or divorced individuals. This trend may be attributed to increased social support and shared responsibility for health management within families (Kim et al., 2018). The study found that married individuals exhibited higher rates of seeking treatment, further emphasizing the importance of social networks in health-seeking behavior.

Conclusion

In conclusion, this study highlights critical gaps in the practice of glaucoma care among residents of Homa Bay Town Sub-County. The low rates of screening, prevention, and treatment practices are influenced by a complex interplay of socio-demographic and socio-economic factors. Addressing these barriers through targeted public health interventions is essential for improving glaucoma awareness and management in this region. Future research should focus on evaluating the effectiveness of community-based strategies aimed at enhancing engagement with glaucoma care among vulnerable populations.By incorporating these elements into your discussion section, you will provide a comprehensive analysis that contextualizes your findings within the broader landscape of glaucoma management in Kenya while addressing specific local challenges faced by residents of Homa Bay Town Sub-County.

CHAPTER SIX
SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter presents a summary, conclusions and recommendations of the study based on the preceding chapters. Major conclusions are highlighted thematically in line with the study objectives. Recommendations from the study have been made in three key areas namely: *recommendations for policy making and the recommendations for further research.*

6.2 Summary of the findings

The broad objective of this study was to assess the Prevalence, level of glaucoma awareness and practices among the residents of Homabay Town Sub County, Homabay County.

The specific Objectives:

1. To determine the prevalence of Glaucoma among the residents of Homabay Town Sub County, Homabay County.
2. To establish the awareness levels of Glaucoma and the associated factors among the residents of Homabay Town Sub County, Homabay County.
3. To determine the practices of Glaucoma among the residents of Homabay Town Sub County, Homabay County.

6.3 Conclusion

6.3.1 Conclusion on the specific objectives.

Conclusions drawn for every specific objective of the study are described in the following section.

Conclusions on Specific Objective 1- Prevalence of Glaucoma

Prevalence of glaucoma has been determined by this study. The glaucoma prevalence rate was

established 24 (6.3%) among those who had different tests. It is equally worth noting that in the qualitative data gathered using the FGDs, Homabay Town Sub County residents reported similar results because screening for glaucoma has not been given prominence by the health management teams.

Conclusions on Specific Objective 2- Awareness of Glaucoma

The awareness of Glaucoma has been determined by this study. Cumulatively, only 24 (6.3 %) were aware and were able to correctly mention at least one symptom and one risk of glaucoma. It is equally worth noting that in the qualitative data gathered using the FGDs, Homabay Town Sub County residents reported similarly low awareness of glaucoma, and therefore more efforts are required to drive awareness.

Conclusions on Specific Objective 3 – Practices

The respondents were asked to state whether they have tried any mechanisms to control glaucoma. The respondents were able to mention screening, treatment and prevention as the main practices that they undertook in Homabay Sub County. Glaucoma screening was done at 5.2%, Prevention practices at 2.6% and Glaucoma treatment at 6.3%.

6.4 Recommendations

The Ministry of Health - by vachue of progressiveness in the prevalence by advancement by age proportionate burden among male than female, these factors need to be included as major focus for awareness and prevention intervention

Partners – development partners to prioritize their support for house income sources diversification and level of improvement of income.

6.4.1 Recommendations for further research

Consequently, further research endeavors are warranted to identify and refine alternative strategies that will optimize the awareness of glaucoma awareness cognizant of these salient findings. This research should be undertaken by the Directorate of Health Promotion and Education (Kenya) and other parts of the world to provide an in-depth understanding of the barriers and facilitators of the

awareness of glaucoma in the light of increased awareness of Glaucoma and possibly recommend other complementary strategies that may increase Glaucoma awareness. It will help strengthen evidence on how effectively to target the right age and sex as well as house hold income level.

6.4.2 Recommendations for Policy

The policy is to prioritize and include glaucoma training and treatment among priority services for advancing age cohorts in their routine health care services. Also to improve household services and levels of income which will go a long way towards improving awareness, screening and treatment for glaucoma in the population

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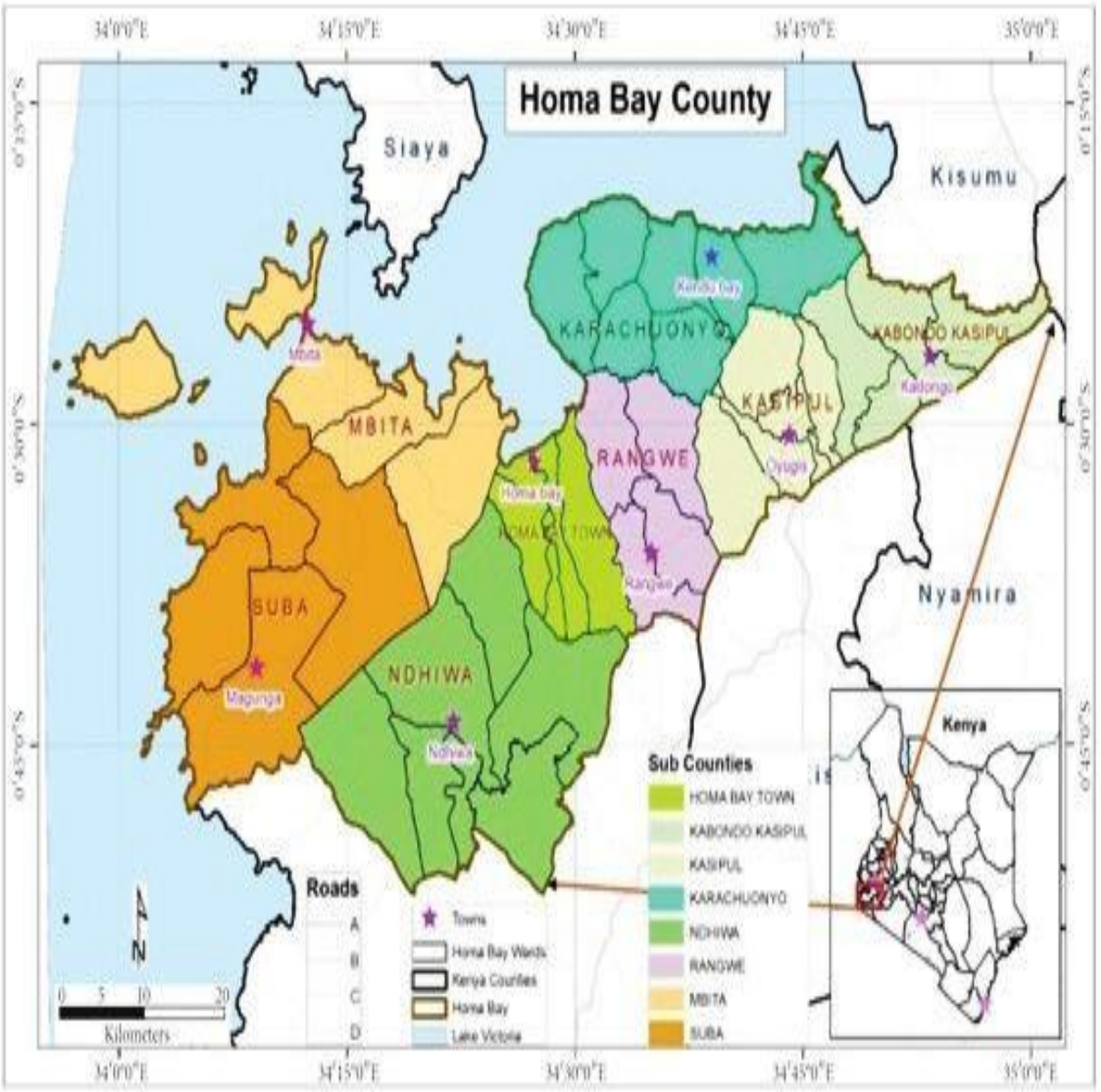
APPENDICES:
APPENDIX I

MAP OF HOMA BAY COUNTY SHOWING HOMABAY TOWN SUB COUNTY



APPENDIX II:

CONSENT FORM.

INFORMED CONSENT FORM

Study Title **:** Assessment of Glaucoma Prevalence, Awareness, and Practices Among Residents of Homa-Bay Town Sub-County, Kenya.

Principal Investigator **:** Jectone Owoko Oduor

Institution **:** Great Lakes University of Kisumu (GLUK)

Contact Information **:** Tel: +254722404449 Email**:** jacktoneowoko@gmail.com

Introduction

You are being invited to participate in a research study aimed at assessing the prevalence, awareness, and practices related to glaucoma among residents of Homa-Bay Town Sub-County. This study is being conducted by Mr.Jectone Owoko Oduor a Masters student of Community Health and Development at Great Lakes University of Kisumu and is designed to gather important information that may help improve glaucoma awareness and management in the community.

Purpose of the Study

The purpose of this study is to:

- Determine the prevalence of glaucoma in Homa-Bay Town Sub-County.
- Assess the awareness and knowledge of glaucoma among residents.
- Evaluate the practices related to glaucoma prevention and management.

Study Procedures

If you agree to participate in this study, you will be asked to complete a questionnaire that will take approximately 30 minutes to complete. The questionnaire will include questions about your health, awareness of glaucoma, and practices related to eye care. Additionally, a small number of participants may be invited to participate in an interview to provide more in-depth information.

Risks and Discomforts: There are minimal risks associated with your participation in this study. However, you may feel some discomfort when discussing your health or personal experiences. If youfeel uncomfortable at any time, you may choose to skip any question or withdraw from the study without any penalty.

Benefits: Your participation in this study may help improve understanding of glaucoma in the community, which could lead to better awareness and management of the condition. Additionally, youwill contribute to valuable research that may benefit future public health initiatives.

Compensation: There is no compensation, money, food, gifts, or other benefits offered for participation in this study.

Confidentiality: Your participation in this study is confidential. All information collected will be stored securely and will only be accessible to the research team. Your name and personal informationwill not be included in any reports or publications resulting from this study. Data will be reported in aggregate form, ensuring that no individual can be identified.

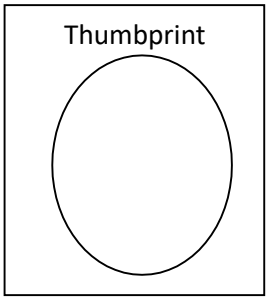
Voluntary Participation: Your participation in this study is entirely voluntary. You have the right to refuse to participate or to withdraw from the study at any time without any consequences. If you decideto withdraw, your data will not be used in the study.

Contact Information

If you have any questions or concerns about this study, please feel free to contact the principal investigator Mr.Jectone O. Oduor at, Tel: +254722404449 Email: jacktoneowoko@gmail.com. This study was approved by the GLUK Scientific and Ethics Review Committee (GLUSERC). Should youwish to discuss your rights as a participant, please contact GLUK Scientific and Ethics Review Committee, GLUSERC Email: ethicalreview@gluk.ac.ke

Consent: By signing below, you indicate that you have read and understood the information providedabove, that you have had the opportunity to ask questions, and that you agree to participate in this study.

Signature of Participant:_____Date: _____



Signature of Interviewer:_____Date: _____

Thank you for considering participation in this important study! Your input is invaluable

N/B: Informed Consent for Illiterate Participants: The researcher will provide detailed verbal explanations of the study's purpose, procedures, potential risks, and benefits. This will be done in a language and manner that is accessible and understandable the informed consent form should be translated into the local language and reviewed with the participants in a language they understand. The participant should be given ample time to ask questions and seek clarification before signing theinformed consent form

APPENDIX III: QUESTIONNAIRE

Bio Data

1. Serial.. .....

2. Sex

a) Male

b) Female

3. Age.....

4. Marital status

a) Single

b) Married

c) Widowed

d) Separated/Divorced

5. Occupation. ....

6. Education level

a) No schooling

b) Primary Secondary,

c) Tertiary (College/University)

Socio-economic status.

1. What is your estimated monthly income? a) <5000

b) 5000- <=l0000

c) 10001- <=25000

d) 2500 l- <=50000

e) >50000

2. How much do you spend on medications per month?a) <1000

b) 1000- <=2000

c) 2001 - <=5000

d) >5000

Screening for glaucoma/signs at presentation

1. Visual acuity (VA) on first presentation

Option	VA	RE	LE
b)	<6/15-6/60		
c)	<6/60-3/60		
d)	<3/60		

'. Intraocular pressure

a) RE .....mmHg

b) LE .....mmHg

3. State of angle.

Eye	Open	Closed
RE		
LE		

4. Vertical cup—disc ratio.

Awareness

Awareness will be measured when a participant responded “yes” to the question

1) Have you ever heard of glaucoma?

If yes

Choose at least one answer among the alternatives which explains the condition as

a) Glaucoma is high eye pressure
b) Glaucoma is high eye pressure causing blindness
c) Glaucoma causes damage to the eye nerve,
d) Blinding eye disease causing eye nerve damage,
e) Eye disease causing visual field loss

Still on glaucoma Awareness

1) Which eye conditions do you know?
2) What is glaucoma?

a) It is high pressure in the eye.
b) It is a disease where the nerve of the eye becomes weak.
c) It is damage to the nerve of the eye due to high pressure.
d) It is an age-related process leading to a decrease in peripheral vision.
e) Don’t know
f) Others (specify)……

2. How did you come to know about glaucoma?

a) General medical practitioner.

b) Ophthalmologist. Optometrist/optician.
c) Eye camp.
d) Family member/relative/friend suffering from glaucoma
e) TV, magazines, other media.
f) Other(specify):

3. What are the risk factors for glaucoma?
   a) Obesity
   b) Increased IOP
   c) Steroids
   d) Chronic smoking and alcohol use
   e) Family history of glaucoma, diabetes, hypertension.
   h) Age.
   i) Myopia (shortsightedness)
   j) Hypermetropia (long-sightedness)
   k) Trauma.
   l) Other (specify)
   m) Don't know.
4. Can glaucoma cause blindness?
   a) Yes.
   b) No.
   c) Don't know.
5. Is visual loss due to glaucoma permanent or reversible?
   a) Permanent and irreversible
   b) Reversible
   c) Don't know

Practices-Treatment/compliance

1. Is glaucoma treatable?
   a) Yes.
   b) No.
   c) Don't know.
2. What are the treatment options available for glaucoma?
   a) Medical/eye drops.
   b) Laser.
   c) Surgery.

d) Don't know.

2. Are you on medical treatment for glaucoma?
   a) Yes
   b) No.

3. If yes, what treatment are you on? (If patient unaware, information can begathered from medical record)
4. On average how many doses do you miss per week?
   a) None.
   b) 1 - 2.
   c) 3-5
   d) More than 5.

Other Practices.

3. What difficulties do you have when taking your medications?

Drug related at

a) Drops fall on the cheek.
b) Too many drops come out.
c) Side effects.
d) Hard to open bottle.
e) Dosage times inconvenient.
f) Hard to squeeze bottle
g) Other. .. …..... .. ….....

Patient related challenges

a) Problem paying.
c) Difficulty remembering.
d) Nobody to instill drops
e) Other

5. Have you had surgery for glaucoma?
   a) Yes
   b) No

6. Which eye?
    a) RE
    b) LE
    c) BE
7. What kind of surgery? (If patient unaware, information can be gathered from medical record)
    a) Argon laser trabeculoplasty (ALTP)
    b) Peripheral iridectomy
    c) Trabeculotomy
    d) Goniotomy
    e) Trabeculectomy (TET)
    f) Augmented Trabeculectomy (TET + Antimetabolite)
    g) Aqueous drainage tube insertion.
    h) Retro bulbar alcohol injection.
    i) Evisceration.
    j) Cyclophotocoagulation (CPC)

8. Perceived importance of compliance to glaucoma medications.
    a) Very important.
    b) Somehow important.
    c) Not too important

9. Perceived importance of attending follow up visits.
    a) Very important.
    b) Somewhat important.
    c) Not too important.

For those with positive diagnosis and existing glaucoma

patients-Patient expectations.

1. Expectations of treatment.
    a) Cure

b) Improvement of vision.

c) Stop progression.

d) Symptomatic relief'.

e) No expected benefit.

f) Other. .....

2. Expectations of surgery (If patient has had surgery or is due for surgery)

Cure

a) Improvement of vision.

b) Stop progression.

c) Symptomatic relief.

d) No expected benefit.

e) Other.....

3. Have you ever had visual fields done?

a) Yes

b) No.

4. Have you ever had gonioscopy done?

a) Yes

b) No.

5. Do you recall being counselled on glaucoma?

a) Yes

b) No

Reasons for not attending clinic

a) My eyes were okay.

b) Unaware of the importance of follow up visits.

c) I forgot to come

d) Fear.

Physical barriers

a) Lack of escort.

b) Age-related weakness.

c) Chronic medical illness or disability

Time/inconvenience

a) Unable to leave work responsibilities.

b) Unable to leave from caring for relative.

c) General inconvenience.

d) Unable to leave household responsibilities.

e) Long waiting times at clinic.

Incidental

a) Out of town.

b) Temporary illness.

c) Wedding or social function.

d) Death of relative or friend.

e) Family problems.

I) Other incidental

obligations.Financial.

a) Transportation costs.

b) Surgical and inpatient fees.

c) Lost wages.

d) Outpatient flees.

e) Food and lodging costs.

Other- List

6. Distance from hospital.

a) < 100km

b) = > l00km

7. Time to travel from home to clinic.

a) < 2hrs

b) = > 2hrs

8. No means/ vehicles to get to hospital.
    a. Yes
    b. No

Co-morbidity

1. Do you suffer from any other chronic illnesses?
    a) Yes
    b) No

2. If yes, what condition?
    a) Diabetes.
    b) Hypertension.
    c) Arthritis.
    d) Dyslipidemia.
    e) Thyroid diseases
    f) Other

APPENDIX IV: KEY INFORMANT INTERVIEW SCHEDULE

Serial number/code……. Date…….

I am going to ask you a few questions of glaucoma prevalence, awareness and practices among residents of Homabay Town Sub County. Please feel free to decline to answer any question at anytime during our interview.

1. Interviewee's designation……..
2. For how long have you been in this glaucoma care?
3. In your own assessment, do you see any challenges in glaucoma prevalence, awareness,knowledge and practices among residents of Homabay Town Sub County?
4. What is the influence of social factors on glaucoma prevalence, awareness, knowledge andpractices among residents of Homabay Town Sub County?
5. How do economic factors on glaucoma prevalence, awareness, knowledge and practicesamong residents of Homabay Town Sub County?
6. What is the influence of health system factors on glaucoma prevalence, awareness,knowledge and practices among residents of Homabay Town Sub County?
7. Explain the extent to which glaucoma is prevalent in HomabayTown Sub County
8. In summary, what are the factors that may influence glaucoma prevalence, awareness,knowledge and practices among residents of Homabay Town Sub County?

APPENDIX V: GRADING AWARENESS LEVEL ON GLAUCOMA

Grade	**Characteristics**
Not aware	Never heard of glaucoma. Has heard but cannot accurately answer any of the questions below
Awareness	Awareness will be measured when a participant responds "yes" to the question "have you ever heard of glaucoma" and chose at least one answer among the alternatives which explains the condition as "glaucoma is high eye pressure", "glaucoma is high eye pressure causing blindness", "glaucoma causes damage to the eye nerve", "blinding eye disease causing eye nerve damage, eye disease causing visual field loss" or similar answers when asked. **N/B** In this study, hearing of glaucoma alone will not be considered as awareness
Some Knowledge	Know there is optic nerve damage. raised IOP, visual field loss/loss of side vision, or can lead to blindness
Fair knowledge	Some knowledge + 2 risk factors and a treatment option
Good knowledge	Some knowledge + >2 risk factors, >1 treatment option

APPENDIX VI: TIME FRAME 2022-2023

Activities	Mar-May	June-Sept	Aug-sept	Aug-SEP	SEP-OCT	Oct - NOV
Proposal Title development						
Proposal writing						
Approval from GLUK-ERC						
NACOSTI approval						
Collection and analysis of data						
Thesis writing submission and defense						
Graduation						

APPENDIX VII: BUDGET.-EQUIPMENT FOR DIAGNOSIS

CTIVITY	**AMOUNT (KSHS)**
Transport.	20,000
Typing and printing	2,000
Accommodations.	20,000
Motivation and allowances for the assistants.	10,000
Stationery.	5,000
Photocopying.	2,000
Binding.	5,000
Meals.	10,000
Laptop.	40,000
SUB-TOTAL	**114,000**
Contingencies.	10,000
GRAND TOTAL.	**124,000**

NACOSTI RESARCH LICENSE

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **905020**

Date of Issue: **16/August/2024**

RESEARCH LICENSE

This is to Certify that Mr.. Oduor OWOKO Jectone of Great Lakes University of Kisumu, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Homabay on the topic: ASSESSMENT OF GLAUCOMA PREVALENCE, AWARENESS, AND PRACTICES AMONG THE RESIDENTS AGED ABOVE 35 YEARS IN HOMABAY TOWN SUB-COUNTY. for the period ending : 16/August/2025.

License No: **NACOSTI/P/24/38799**

905020

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

GREAT LAKES UNIVERSITY OF KISUMU
(GLUK)

P. O. Box: 2224-40100 KISUMU, Tel: 254-057-2023972

Email: ethicalreview@gluk.ac.ke

Certificate of Approval of Research Protocol
GLUK Scientific and Ethical Review Committee (GLUSERC)
Ref: No. GLUSERC /014/2024

To: Jectone Owoko Oduor –Principal Investigator

Date: 30th July 2024

TITLE: ASSESSMENT OF GLAUCOMA PREVALENCE, AWARENESS,AND PRACTICES AMONG THE RESIDENTS AGED ABOVE 35 YEARS IN HOMABAY TOWN SUB-COUNTY.

The Great Lakes University Scientific and Ethics Review Committee (GLUSERC) has reviewed the above-titled research project, including the associated documentation noted below, and finds the research project acceptable on ethical grounds for research involving human subjects and hereby grants ethics approval.

This approval applies to research ethics issues only. The approval does not obligate an institution or any of its departments to proceed with the activation of the study. The Principal Investigator for the study is responsible for identifying and ensuring that resource impacts from this study on any institution are properly negotiated, and that other institutional policies are followed. GLUSERC assumes that investigators continuously review new information for findings that indicate a change should be made to the protocol, consent documents, or conduct of the trial and that such changes will be brought to the attention of GLUSERC in a timely manner.

Documents included in this approval are:
1. Protocol Version 2.
2. Informed Consent Form version 1.

Note that the certificate is valid for one year from 30th July 2024 to 30th July 2025 and all applications/ re-submissions should reach the GLUSERC Secretary two weeks before the next scheduled meeting. Ordinary meetings are held **EVERY FIRST FRIDAY of the month**.

Thank you.

Sincerely,

.....

GLUSERC:

CHAIR, or CO-CHAIR or SECRETARY