WOLKITE UNIVERSITY COLLEGE OF MEDICINE, AND HEALTH SCIENCE DEPARTMENT OF NURSING

Awareness towards glaucoma and its associated factors among adult clients in Ophthalmology department of Gurage zone hospitals(2023)

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Table of Contents

List of Tables

List of Figures

Acronyms and Abbreviations

AOR…..…….Adjusted odd ratio

CVD……Cardiovascular disease

BSc-…….……. Bachelor of Science

CI……Confidence interval

COR……Crude odds ratio

DM……. Diabetes mellitus

Dr. –…….…… Doctor

EC- …….…..…Ethiopian calendar

GKLQ-…….……. Glaucoma knowledge level questionnaire

GC…… Gregorian calendar

HX ……..... History

HTN…….Hypertension

IEC-…….…. Informational educational communication

IOP-……Intra ocular pressure

LC-…….…...…… Laminar cribrosa

LGN- …….…..…. Lateral geniculate neurons

MSc- …….Masters of Science

OAG…….Open angle glaucoma

POAG-…….Primary open angle glaucoma

SD-……standard deviation

TMs –……. Team Members

UNDP-……. United Nation Development Program

WUSTH…….Wolkite University specialized and teaching hospital

ABSTRACT

Background: Awareness of glaucoma is directly affected by good eye screening practice which in turn helps for reduction of the blindness burden of glaucoma. However, it is unknown in the study area, making provision of interventions difficult. This study was intended to assess awareness of glaucoma and associated factors among adults in Gurage zone hospitals, South Ethiopia.

Objective*:* Our research aims to assess Awareness towards glaucoma and associated factors among adult clients in Ophthalmology department of Gurage zone hospitals (2023 GC)

Method and Materials: Institutional based cross-sectional study was conducted among adult client who visits Ophthalmology department of Gurage zone hospitals. Paper based interview and standardized structured questionnaire was used to collect data after verbal informed consent. Data collection was conducted May 15 up to May 29. The collected data was cleaned, coded and entered in to SPSS version 26. Errors related to inconsistency was minimized using cross tabulation. The results were presented in narrative, tables, and graphs. Furthermore, logistic regression, specifically binary and multivariable logistic regression, analysis was used to identify factors related awareness towards glaucoma among patients.

Result: A total of 179 study participants were involved making response rate of 94.22%. More than half of the respondents 97 (54.2%) were male. The proportion of awareness of glaucoma was 44%, with 95% CI [32.44-55.56], it was positively associated with educational status: primary and secondary education [AOR:1.9,1.1-2.8], college and above[AOR:2.06,1.3-3.1], and history of chronic diseases, HTN [AOR:0.6,0.1-3.7]. place of residence [AOR: 0.68,0.24-1.8].

Conclusion: The Level of awareness towards glaucoma was low Mean glaucoma awareness score were 44%, with 95% CI (32.44%-55.56%) in this population. The level of awareness towards glaucoma in this study were strongly associated to Level of education of respondents (AOR =2.06(1.3-3.1, 0.001)). The study findings imply the need for health education about the glaucoma to effectively aware clients, and prevent blindness due to the disease.

Keywords: Glaucoma, Awareness, Gurage zone, Ethiopia

1. Introduction

1.1 . Background

Glaucoma is a group of diseases characterized by progressive optic neuropathy, characteristic changes, and loss within the visual view. More recently it's been described as a neurodegenerative disorder of the second cranial nerve with acquired loss of retinal ganglion cells (1). People with glaucoma often do not experience symptoms until the disease is advanced and there has already been considerable damage to the person's vision (2).

Globally, 90% of the Glaucoma-affected people are undiagnosed (3). The prevalence among the adult population was estimated, at 2.31% in Asia, 3.65% in Latin America and the Caribbean, in Asia the prevalence of POAG ranged from 0.5% in a Mongolian population to 3.9% in a Japanese group and 4.20% in Africa (4).

Glaucoma is the second leading cause of blindness next to cataracts globally (5). In Ethiopia, glaucoma is the fifth cause of blindness causing irreversible sight loss for an estimated 62,000 Ethiopians (6). The burden of each of these diseases varies among racial considerably and ethnic groups worldwide. Patients with glaucoma are reported to have poorer quality of life, reduced levels of physical, emotional, and social well-being, and utilize more health care resources (7).

1.2. Statements of the problem

Glaucoma is the second leading cause of irreversible blindness. The number of people with glaucoma was reported as 2.72 million In the United States,60 million worldwide and it is found that 8.4 million of patients experienced glaucoma related visual loss in 2010.It is estimated that those number s will be doubled by the effect of aging and population increase(5). In United States, more than 80% of cases are Open angle glaucoma; however, angle-closure glaucoma is responsible for a disproportion number of patients with severe vision loss. Blindness and low vision affect 3.3 million Americans age 40 and over in 2020 about 80 million people have glaucoma worldwide and this number is expected to increase to over 111 million by 2040. Past trends in the disease prevalence reveal that between the years of 2000 to 2013 over 16 million people in the world had glaucoma (8).

Globally, 15% of blindness is due to glaucoma and about 600,000 people go blind annually (9). Africa accounts for 15% world's blindness burden due to glaucoma (10). It is the fifth common cause of blindness in Ethiopia which results an irreversible sight loss for an estimated 62,000 Ethiopians (6),(8)

The impact of sight lose from glaucoma has profound implications both for the person affected and for the society as whole (11). The increasing prevalence of glaucoma is expected to cause a significant economic burden and poor quality of life.

Generally Glaucoma is leading cause of blindness among African population(12) .High glaucoma morbidity among some African communities may be attributed to low trained professionals low awareness, and under-utilization of eye care service as well as limited availability of treatment procedures (13),(14). It has been estimated that half of glaucoma patients are already blind in at least one eye in presentation in Africa (15). The situation is worse in sub Saharan Africa where it is further compounded by poor awareness in the region (16).

Improving community awareness early is a key means of addressing its devastating consequences by enhancing people alertness, increasing regularly eye screening practice which in turn helps to identify undetected cases. Contrary to this, lack of awareness appeared to influence self-care practices negatively (17).

It is also equally important to design effective awareness-raising strategies based on identified factors affecting the awareness about glaucoma. Most of the previous study regarding glaucoma in Ethiopia was institution based. Only a few studies tried to assess awareness of glaucoma and associated factors at the community level. For early diagnosis and management of glaucoma, the level of awareness about glaucoma will have a great contribution(18). While the late diagnosis of glaucoma is due to a lack of awareness about the disease. This significantly increases the risk of blindness. There for this study aims to assess awareness towards glaucoma and associated factors among adult clients in Ophthalmology department of Gurage zone hospitals (2015EC)

1.3. Significance of the Study

The importance of this study is to assess the awareness towards glaucoma in population we live in and to prevent blindness of glaucoma, rising most effective strategies to increase the awareness. And also, our research will contribute for future studies that will be under take the awareness towards glaucoma

Increasing awareness about glaucoma will increase early detection of glaucoma and will thereby reduce blindness due to glaucoma. Also refusing of any risks that leads to this disease. The importance of this study is to early diagnosis and eye examination of eye at least between years.

Public awareness plays a paramount role for early detection and timely treatment of glaucoma. This delays early blindness from glaucoma. It is also equally important to design strategies based on identified factors affecting awareness of glaucoma. Because of this reason we are interested to construct this research.

2. Literature Review

2.1. Magnitude of Glaucoma Awareness

The glaucoma is one of the most concerning eye diseases that will make us blind permanently if not treated early. As most of clinical definition of glaucoma accounts for the fact that glaucoma is an irreversible group of eye disease that characterized by optic nerve damage and elevation of intraocular pressure (IOP) associated with optic cupping visual fluid loss. Glaucoma is responsible for an estimated 11.7% of total blindness(19).

In 2010, of 32.4 million blind individuals worldwide, glaucoma was the cause of blindness in 2.1 million (6.5%) people (20). Glaucoma cause visual impairment defined as visual acuity in the better eye between less than 6/18 and 3/60 or greater in 4.2 million (2.2%) of 191 million visually impaired individuals worldwide(21). Because of the association with older age, the overall prevalence of glaucoma was lower in regions with younger population than in high income region with younger population than in high income region with relatively old population(5). The global prevalence glaucoma was roughly 3.5% for people age 40-80 years(22). Primary open-angle glaucoma with a prevalence of about (0.5%)(19). In 2013 the number of people aged 40-80 years, and affected by glaucoma worldwide was estimated to by 64.3 million, and this number is predicted to be elevated to 76 million in 2020 and to 112 million in 2040(8).Regarding the global prevalence, Africa is estimated to have the highest glaucoma prevalence of 4.79 as compared to 2.93 in Europe, and 3.40 in Asia(23).

Cook stated that east African indicated a high glaucoma prevalence than west and southern Africa (24) .It's not surprising that the population of Africa glaucoma prevalence is higher than Europe and Asia. In West Africa indicated a high glaucoma prevalence of 6.5% (25). That prevalence of glaucoma rate is affected by the awareness, and perception towards glaucoma. High glaucoma morbidity among some African communities may be attributed to low awareness, under-utilization of eye care service as well as the limited availability of treatment procedure (26).

A review of relevant population based survey of glaucoma, blindness, and visual impairment in Sub-Sahara Africa indicate that glaucoma affect about 45 of adults aged 40 year and above accounts for 15% of blindness(9), (15) .

Africa is the region with the highest incidence and prevalence of glaucoma, most of which is open angle glaucoma(27). It's not surprising that the population of Africa glaucoma prevalence is higher than Europe and Asia. Addition to this the tends to be a lower reporting of glaucoma in Africa compared to other blinding conditions in global burden data because survey in Africa may have had limited diagnostic capacity of glaucoma. The higher prevalence rate and low diagnostic capacity to glaucoma are aggravated by the awareness and perception towards glaucoma. High glaucoma morbidity among some African communities may attributed to low awareness, underutilization of eye care service as well as the limited availability of treatment procedures. It has been estimated that half of glaucoma patients are already blind in at list one eyes. When coming to Africa the situation is worse, in sub-Saharan African, were it is further comp wended by poor awareness, and knowledge to glaucoma in the region(8),(28)).

Ethiopia is believed to have one of the world's highest rate of blindness (1.6%) and low vision (3.7%) of which more than 80% is either treatable or preventable (15). In Ethiopia glaucoma is the fifth common cause of blindness which result an irreversible sight loss for an estimated 62,000 Ethiopians (9).

A study conducted in turkey on knowledge and awareness about glaucoma in glaucoma patients and general population. The study found awareness about glaucoma was 64.1% in people without glaucoma. The knowledge and awareness about glaucoma were found to be higher in glaucoma patients compared to healthy people. The limitations of this study was that it only included the age between 40 and 80(8).

Ghana study revealed that out of total of 300 respondents, 60.3% were female and 39.3% were aware of glaucoma. Majority (99.1%) of respondents Aware of glaucoma also agreed the disease can result in blindness with only (28%) affirming that blindness from glaucoma is irreversible. Nearly half (49.7%) of the respondents perceived themselves to be at risk of developing glaucoma awareness. Approximately, 20.7% of the respondent have had their eye screened with just a few (4.3%) screening for glaucoma(29)

A study conducted in Nigeria, people with more education, and people that live in the urban areas tend to have heard about glaucoma compared with people with less education, and who live in the rural areas; glaucoma was perceived as 'a dangerous eye disease that can cause blindness if not

treated early; serious eye problem; an eye problem that can eventually result to blindness, and a dangerous eye problem that can easily render a person blind'. Four a priority themes and ten emergent themes were identified. To sum up the study there is low awareness of glaucoma in this population, and this encourages people to indulge in certain risk behavior that could predispose them to glaucoma (30).

Cross-sectional study conducted Agaro town, south western Ethiopia. Only eight peoples (2.4%) were aware of glaucoma. The association between awareness and attaining high school or better education was statistically significant ($p < 0.0001$). In conclusion awareness of glaucoma in this population is very low (15).

In a population based cross sectional study conducted in North West Ethiopia Gish Abay town: About 24.4% adults were aware of glaucoma among those the awareness was so low (31).

A cross sectional study at Menelik II Referral Hospital found that: among new ophthalmic patients age >= 16 year at Menelik II hospital 2010. This study interpreted us among the interviewed 28 .4% were found to be aware of glaucoma 75.8 of them had some knowledge this research recommended that the present level of glaucoma awareness and knowledge should be enhanced through provision of health education and by incorporating glaucoma education in to the curriculum of high school and health care providers(32).

2.2. Factors affecting awareness of glaucoma

2.2.1. Socio demographic factors

Educational status was significantly associated with clients' awareness towards glaucoma. Clients with low educational level had experienced poor awareness towards glaucoma according to the study conducted in India (AOR: 8.93; 95% CI: 1.14 to 69.86)[12]Turkey(95% CI, 11.80 to 366.65)[33] Ghana(AOR=0.041; 95% CI=0.016–0.11)[27] Gondar(AOR: 3.15; 1.72, 5.77)[29]

The other factor are age, a study conduct in Turkey (OR=3.6 with 95% CI (1.7, 7.1)(33).However, No associations were found between gender and awareness, or knowledge of glaucoma ($p > 0.05$) or age ($p > 0.05$) (34).The prevalence of POAG rises with age. Typical estimates in white persons 0.9 %, 2% and 3% at age 65, 75 and 85 years respectively. The prevalence of POAG in black populations is four to seven times higher. Overall, men hold a more than three times higher risk of having POAG than women (OR=3.6 with 95% CI (1.7, 7.1)(33)

A study conducted in Ghana stated that, Perceived risk of glaucoma was also influenced by area of residence(rural,(AOR=0.344; 95% CI=0.21–0.57)), being young (18–24 years (AOR=4.308; 95% CI=2.36–7.88) (29).

A study in North West Ethiopia Gonder revealed that, income level >2000 Ethiopian birr [4.65; 2.59, 8.37] (31). According to different literatures reviewed educational status(9), (8), age(19), (35), (27)), sex (9), (36), (15). Type of occupation (medical professional) were positively associated with awareness of glaucoma.

2.2.2. Clinical factors

A study in China found in multivariate regression analysis, age, family history of glaucoma, systemic hypertension, and IOP were identified as significant independent risk factors (37).

Netherland Rotterdam community-based study which examining every participant by perimeter, tonometry and ophthalmoscopy the presence of diabetes mellitus was associated with an overall rise of mean IOP of both eyes of 0.31 mmHg (95% CI 0.12, 0.50), and with a three-fold increased presence of high-tension glaucoma (OR= 3.11, with a 95%CI of1.12, 8.66).Hypertension was associated with an odds ratio of 2.33 (0.99, 5.47) for high-tension glaucoma(33). A family history of glaucoma (relative risk [RR] =2.1, 95% confidence interval [CI]=1.03–4.2), the presence of age-related macular degeneration (RR= 2.2, 95% CI 1.2–3.9), the presence of pseudo exfoliation (RR= 9.4, 95% CI 2.6–34.4), and a cup-disc ratio (CDR) greater than 0.7 (RR =7.9, 95% CI 4.4–14.1) were associated with greater risk of development of at least possible OAG. Having ever taken blockers (RR= 4.8, 95% CI 1.2–18.8), the presence of pseudo exfoliation (RR= 11.2, 95% CI 2.0–63.3), and a CDR higher than 0.7 (RR= 11.0, 95% CI 4.6–26.8) also indicated significant risk of development of at least probable OAG(38).

A study in North West Ethiopia Gondar revealed that, eye examination, chronic disease, were positively associated with awareness of glaucoma or history of eye examination [AOR: 6.52; 3.46, 12.25], income level >2000 Ethiopian birr [4.65; 2.59, 8.37] and history of chronic diseases [AOR; 2.93: 1.25, 6.85] (39).

Another study in northern Ethiopia states that the prevalence of glaucoma was 66(26%) with a 95% CI of 17.7, 35.4%). Individuals with Positive family history of glaucoma (AOR: 3.72, 95% CI: 1.03–3.53), age (AOR: 3.21, 95% CI: 1.92–5.99) and elevated intraocular pressure (AOR: 3.09, 95% CI: 1.45–6.59) were statistically significant contributing factors for the development of glaucoma (40).The occurrence of glaucoma is affected by the level of intra ocular pressure (IOP), race, age and inheritance. Among these intra ocular pressure is the only modifiable risk factor (21).The risk factors of glaucoma are numerous: Intraocular pressure (IOP), pseudo exfoliation syndrome, high myopia (greater than −3 diopters), thinner central corneal thickness, family history of glaucoma, low ocular perfusion pressure, drugs (steroids, antidepressants, calcium antagonists) (41).

2.3. Conceptual framework

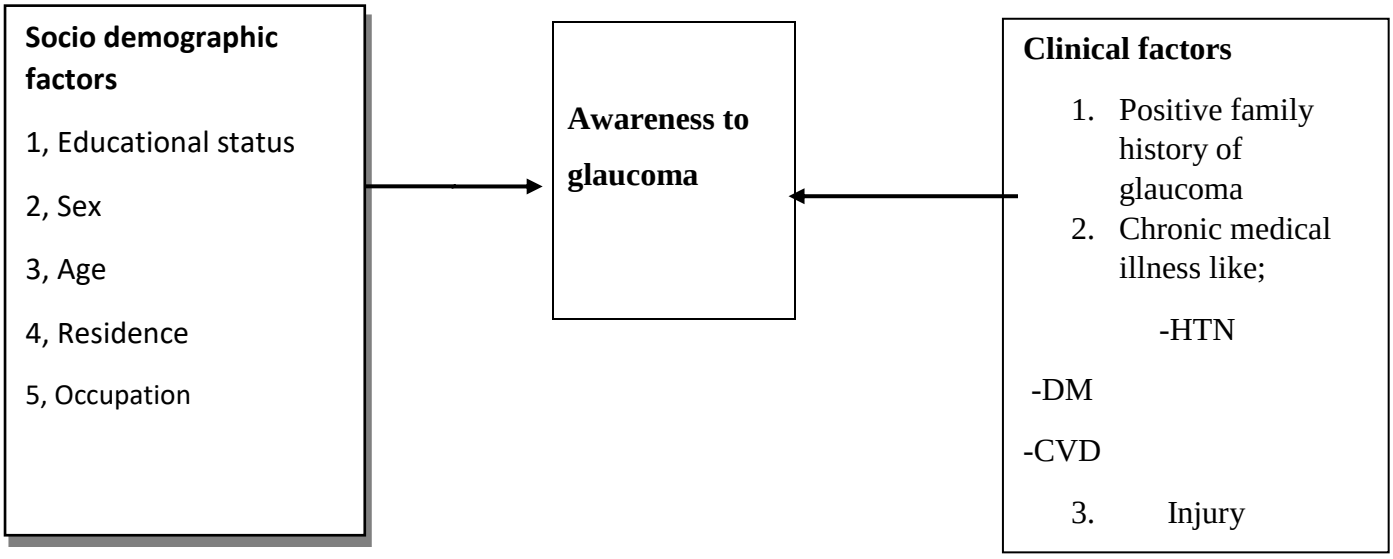

Figure 1: conceptual frameworks for awareness of glaucoma, and associated factors among adult

3. Objectives

3.1. General objective

1. To assess awareness towards glaucoma and associated factors among adult clients in ophthalmology department of selected Gurage zone hospitals, Ethiopia, 2023GC.

3.2. Specific Objective

1. To determine the awareness towards glaucoma among adult clients in ophthalmology department of selected Gurage zone hospitals, Ethiopia, 2023GC.

2. To identify factors associated with awareness of glaucoma among adult clients in ophthalmology department of selected Gurage zone hospitals, Ethiopia, 2023GC.

4. Methods and material

4.1 Study area and period

The study was conducted from March 17 up to August 15/2023GC. Gurage zone is one of the administrative zones in South Ethiopia. It has 13 districts and two town administrations. Wolkite town is the capital of Gurage zone. It is found 153 km southwest to Addis Ababa, the capital of Ethiopia. According to the 2007 national household census, Gurage zone has total population of 1,279,646. There are seven hospitals (six public and one non-governmental) serving the total population in the zone. Five of the hospitals in the zone are primary hospitals and one specialized and teaching hospital and the remaining one is general zonal hospital. Additionally, there are 72 health centers in Gurage zone. Three of five hospitals in Gurage zone were involve in the study.

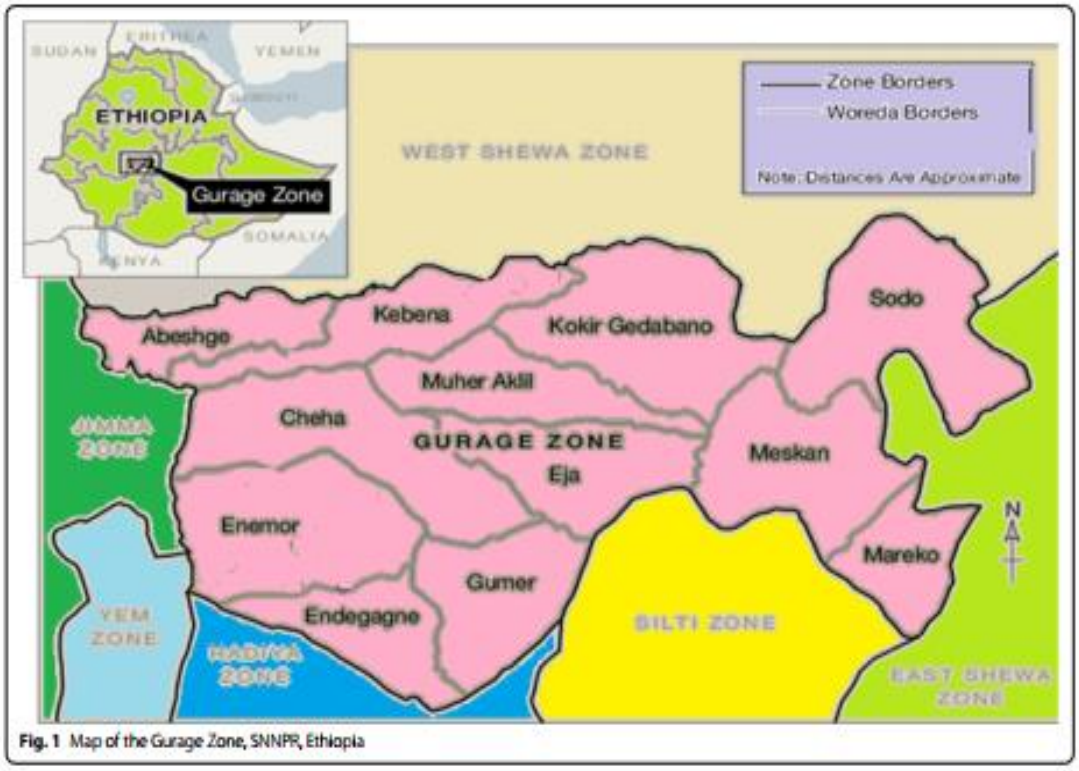

Fig. 1 Map of the Gurage Zone, SNNPR, Ethiopia

Figure 2: Map of study area Guragae Zone, SNNPR, Ethiopia 2023

4.2 Study design

Institutional based cross-sectional study design was conducted.

4.3 Population

4.3.1. Source Population

All patients aged 18 and above years old visit the ophthalmic outpatient's department of gurage zone hospitals was the source population.

4.3.2. Study Population

All patients, aged 18 and above years old visit the ophthalmic outpatient's department of Gurage zone hospitals during the time of data collection was the study population.

4.4. Eligibility criteria

Inclusion criteria

- Clients who are 18 and above and visit ophthalmologic ward in Gurage zone hospitals at the time of data collection.
- Patient who are willing to participate in the study

Exclusion criteria

- Patients with cognitive, speech or hearing impairment
- Participants who are severely ill and mentally ill during data collection were excluded from the survey.

4.5. Sample size determination

The sample size was calculated based on single population formula by the minimum sample size required, for a very large population N>10.000 $n= (z^2* p (1-p))/W^2$. The sample size was calculated using the following standard according to the study done in Gish Abay town which used as population proportion (P) 24.4, confidence interval (CI) 95%, marginal error (W) 0.05, with constant standard distribution (Z) value 1.96 calculated.

Proportion awareness of Previous study (P=0.24)

Z- Critical Value Z= 1.96

w- Marginal error w= 0.05

n- Sample Size n=?

$$n= \frac{(Z\alpha/2)^2 P (1-p)}{d^2}$$

$$n= \frac{(1.96)^2\ 0.244(1-0.244)}{(0.05)2}$$

$$n= \frac{3.84(0.244\times0.756)}{0.0025}$$

$$n = \frac{3.84 \times 0.184464}{0.0025}$$

$$n = \frac{0.7083}{0.0025}$$

$n=283$

*With minimal reduction sample size formula

$$N = \frac{n}{1+(n/N)}$$

$$N = \frac{283}{1+ (283/386)}$$

$$N = \frac{283}{1+ (0.733)}$$

$N =163$

By adding estimated number non-respondents' rate of 10% calculate sample size

$n=10\% \times 163=16.3$

$n=163+16.3$

$n=179$

A total of sample size 179 was used.

The values of (P) previous study for the formula were taken from research.

4 .6. Sampling Technique and Procedure

The data was collected from study participants by interviewer administered questionnaires. A systemic random sampling method was used to select the study subjects from the people who were visit the ophthalmic outpatient's department of Gurage zone hospitals. Among 7 hospitals (Butajira, WKUSTH, Agena, Atat, Gunchire, Mehalamba, Bue and Quante) in Guragae zone three hospitals are selected randomly using Simple random sampling, lottery method. After selection of 3 Hospitals randomly, sample size for each Hospital was determined based on proportional allocation referring to number of clients who visits ophthalmological unit in each hospital. Then steady population at each health facility was selected using Systematic random sampling (SRS) technique by calculating K value for each Hospital.

4.5.2 Schematic Diagram of sampling procedure to select study participants

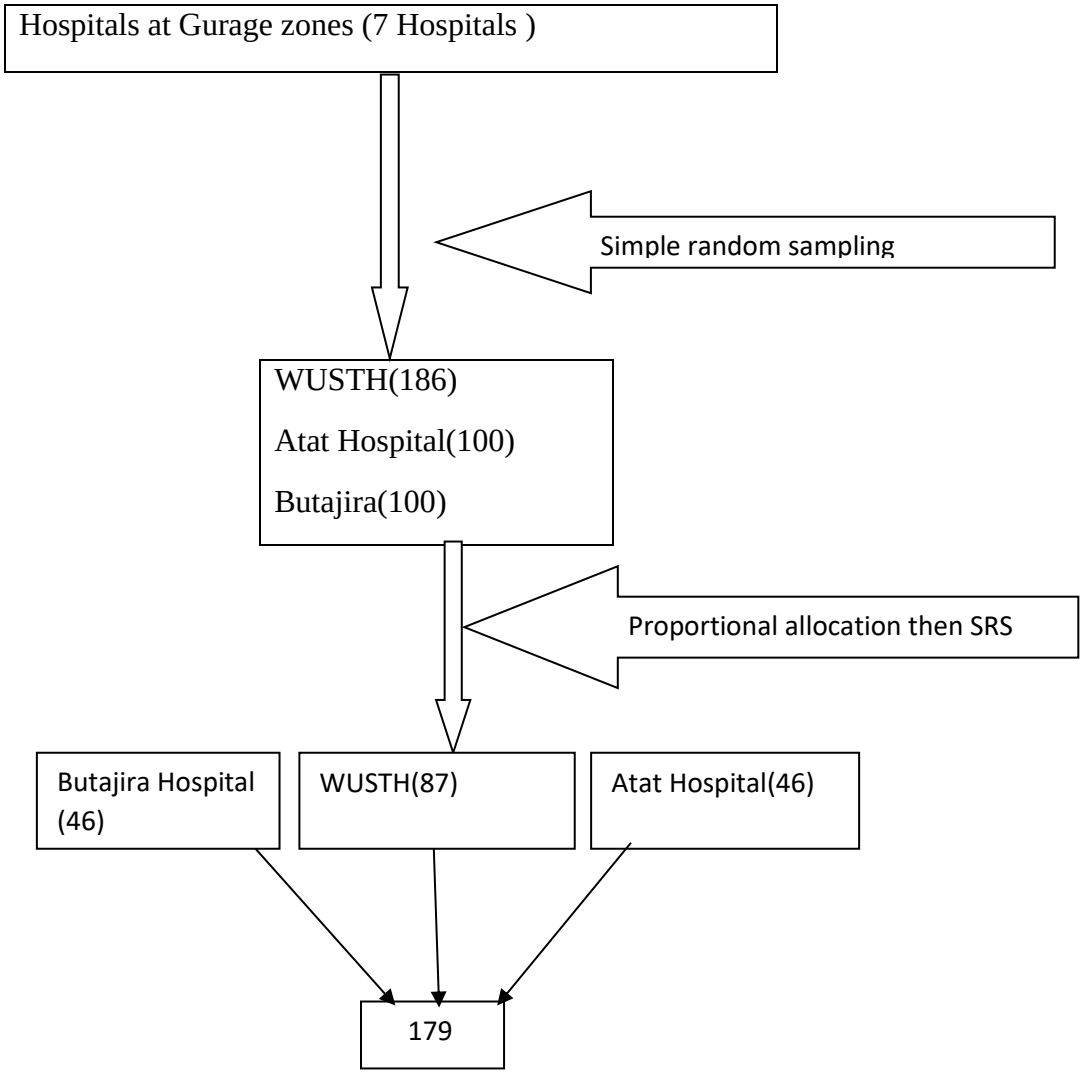

Figure 3: Schematic Diagram of sampling procedure to select study participants

4.7. Data collection tool and procedure

A structured questionnaire adapted from previously published studies (29, 9, 40, 41) was utilized. It was initially prepared in English, translated into Amharic (local language) and re translated to English to check consistency in meaning of words and concepts. The questionnaire included background information, clinical characteristics and questions to measure awareness of glaucoma.

4.8. **Data analysis procedure**

After completion of data collection, to maintain consistency, the data was check and verified before tabulation. The SPSS program, version 26, was used for data entry, cleaning and analysis. Descriptive statistic, including frequency and percentage was used to describe the socio-demographic characteristics. Binary logistic regression model was used to identify factors which were associated with glaucoma awareness. Variables were fitted into the model by using the enter method. Hosmer and Lom show model fitness were checked. Multi-collinearity between the independent variables was also checked by tolerance and variance inflation factor (V.I.F). Adjusted odds ratio with 95% confidence interval was used to identify the significant factors. A p-value ≤ 0.05 was considered statistically significant.

4.9. **Study Variables**

- **Dependent Variables**
  - Awareness towards glaucoma

- **Independent variable**

- Age
- Sex
- Educational status
- Positive family history
- Occupation
- Chronic medical condition
- Residence
- History of eye injury

4.10. **Operational and Term Definition**

Glaucoma: Glaucoma is an optic neuropathy associated with characteristic structural damage to the optic nerve and associated visual dysfunction which are seen clinically as enlargement of the optic-disc(1),(42)

Awareness: people who have heard about glaucoma are said to be they are aware of glaucoma.

Good awareness level: In this study, good awareness level refers to a respondent's ability to demonstrate reasonable understanding or awareness about the common symptoms, risk factors, complication (if not treated), diagnosis and treatment of glaucoma and is said to have good awareness level about glaucoma if he or she obtain a score of 50% or more in part 3 of the (questionnaire awareness measurement questionnaires) which are related to common symptoms, risk factors, complication, treatment (6)(43),(44), (45)

4.11. **Data quality management**

Questionnaires are adapted from former questionnaires other researchers used to standardize questions and maintain uniformity among researches. Amharic translations were used to administer questionnaires to patients in order to communicate respondents in a way that makes sense and allows for more relevant feedback. Leading or double-barreled questions and jargon questions was avoided in questions administered to respondents.

Research was reviewing each open-end and closed questions in quantitative data and thoroughly review qualitative responses before removing particular respondents

4.12. **Ethical Consideration**

This study was conducted after the acceptance paper given by the research commute of wolkite University College of medicine and health science department of nursing, beside this permission asking paper was given from wolkite University College of medicine and health science department of nursing to collect the possible data from gurage zone hospitals. On the data collection the clients were informed about the purpose of the study and the collection starts after taking the verbal willingness. The personal information of individual was kept confidential and secure objective of the study was clearly explained for the participants to get verbal consent.

5. RESULT

Socio demographic characteristics

A total of 179 study participants were involved making response rate of 94.22%. More than half of the respondents 97 (54.2%) were male, with a mean age of 52 and standard deviation of 4.1 years. Nearly 54.2% of respondents were found between the ages of 40 to 60 years. From the total study participants 27.4% were unable to read and write, the remaining 22.3 % completed primary school, 19.2% have completed college or above.

Table 1: Socio demographic characteristics of study participates in Guragae zone public hospitals, July, 2023 (N=179)

Variable	Category	Frequency	Percent
Sex	Male	97	54.2
	Female	82	45.8
Age group	18 to 39	62	34.6
	40 to 60	97	54.2
	above 61	20	11.2
Education level	unable to write and read	49	27.4
	able to write and read	27	15.1
	primary school	40	22.3
	secondary school	28	15.6
	college and above completed	35	19.6
Place of Residence	Urban	88	49.2
	Rural	91	50.8
Occupation	Yes	16	8.9

Clinical characteristics

About 64(35.8%) of adults had chronic diseases either diabetes mellitus, cardiovascular disorder or hypertension or both and around 48(26.8%) of participants had history of eye injury and 60(33.5%) of participants had nearsighted and around 28 (15.5) of adults had positive family history of glaucoma.

Table 2: Clinical characteristics of study participates in Guragae zone public hospitals, July, 2023 (N=179)

Variable	Category	Frequency	Percent
	No	163	91.1
HX of DM	Yes	30	16.8
	No	149	83.2
HX of HTN	Yes	27	15.1
	No	152	84.9
HX of CVD	Yes	7	3.9
	No	172	96.1
HX of eye injury	Yes	48	26.8
	No	131	73.2
Family HX	Yes	28	15.5
	No	84	46.9
	I don’t know	67	37.4

Awareness of glaucoma

Over all (N=179) respondent were interviewed regarding the glaucoma awareness out of one hundred seventy nine respondents only 82(45.8%) of them had heard of an illness called glaucoma (Table 3) those who had heard of glaucoma the main source of information about glaucoma were mass media, health workers, friends, and other sources accounts for 43(52.4%), 32(39.0%), 2(2.4%), and 5(6.1%) respectively.

Table 3: awareness towards glaucoma among the study participates in Guragae zone public hospitals, July, 2023 (N=179)

Variable	Category	Frequency	Percent
Have you ever heard about glaucoma?	No	97	54.2
	Yes	82	45.8
If yes, where did you heard it from	Mass media	43	52.4
	Friends	2	2.1
	Health workers	32	39.0
	Others	5	6.1

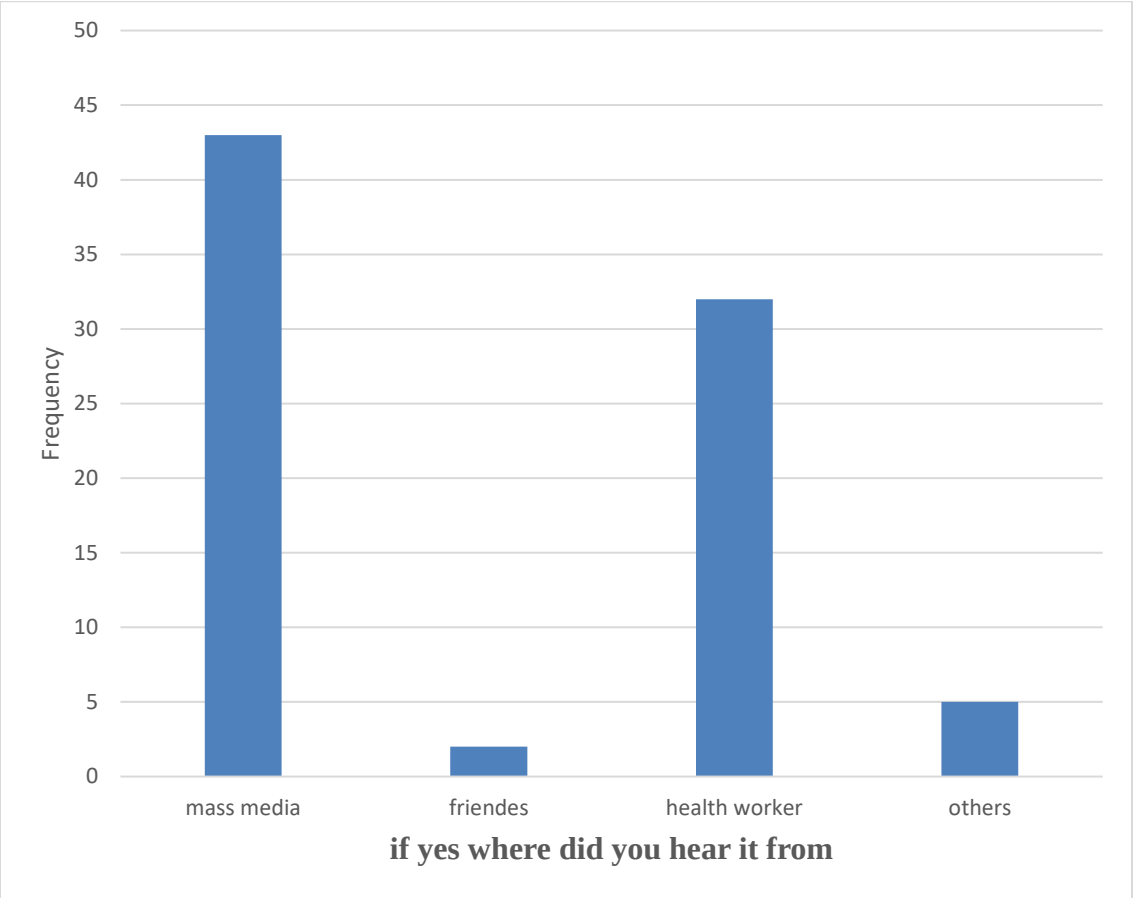

Figure 4: Showing frequency of patients' source of glaucoma information among Guragae zone public hospitals in July 2023.

Among the patients who ever hear about glaucoma, majority (67.1%) had information about glaucoma limit ability to see wider spatial area, and about 62 (75.6%) of patients agreed glaucoma could cause blindness. Whereas, out of patients who ever hear about glaucoma 43(52.4%) reported looking direct to the sun is not cause glaucoma, 46(56.1%) blindness from glaucoma is not curable. Mean percentile of glaucoma awareness score were 44%, with 95% CI (32.44%-55.56%).

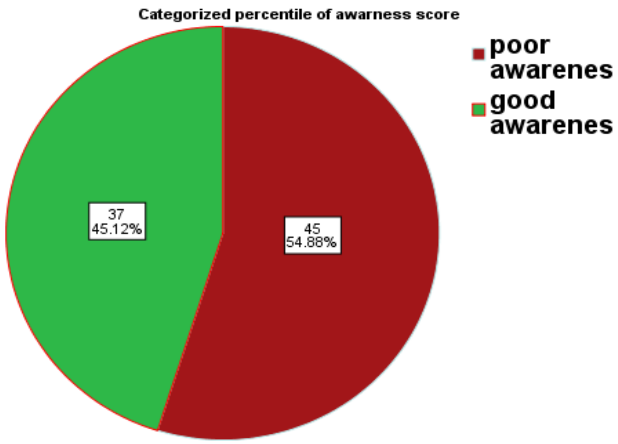

***Figure 5: Pie* chart of categorized percentage of glaucoma awareness score**

Table 4: Glaucoma awareness measuring questions and responses' frequency or % among patients who ever hear about glaucoma 2023

Variables	Category	frequency	Percent
1. Glaucoma limits the ability to see a wider spatial area	No	27	32.9
	Yes	55	67.1
2. Glaucoma results in blindness	No	20	24.4
	Yes	62	75.6
3. looking direct to the sun is not cause glaucoma	No	43	52.4
	Yes	38	46.3
4. Blindness from glaucoma is not curable	No	36	43.9
	Yes	46	56.1
5. sign and symptom of glaucoma are itchy and swollen eyes	Yes	43	52.4
	No	39	47.6
6. The risk of developing glaucoma increases with age	No	28	34.1
	Yes	54	65.9
7. Glaucoma can never be detected unless blindness occurs	No	42	51.2
	Yes	40	48.8
8. Glaucoma could be transmitted by heredity	No	56	68.3
	Yes	26	31.7

Factors associated with awareness of glaucoma

A total of 8 variables were enter in binary regression model by using enter method. Those variable in the model with a p- value less than 0.25 were (educational level, COR=4.57(1.4-14.4,0.009), place of residence COR=2.65(1.1-6.5, 0.03), employment status 4.5(1.1-18, 0.034) history of hypertension COR=0.37(0.1-1.96, 0.24) candidates for multivariable logistic regression model.

From those variables entered in multivariable regression analysis found that: Respondents who were college/higher achievers have 2.06 times more likely to have better glaucoma awareness score than participants who had no formal education AOR =2.06(1.3-3.1, 0.001), while participants education level is primary or secondary level, their likelihood of having good glaucoma awareness score is 1.9 times higher than unable to write and read , AOR =1.9(1.1-2.8, 0.02),Employed participants have 5.9 times more likely to have good glaucoma awareness than unemployed participants AOR=5.9(1.3-26, 0.02).

Table 5: Cross tabulation and Bivariate regression analysis of glaucoma awareness in the previous 6 months back to predictor variables Among Patients in selected public hospitals, Guragae zone, Ethiopia 2023

Variables	Category	Glaucoma awareness score		COR(95%CI)	P-value
		Poor	Good		
Sex	Female	16	11	1	1
	Male	29	26	1.3(0.51-3.3)	0.57
Age	Age 18-39	16	16	1	1
	Age 40-60	12	8	0.66(0.21-2.1)	0.48
	Age > 60	17	13	0.76(0.28-2.1)	0.59
Educational level	Unable to write and read	24	6	1	**1**
	Primary/secondary	14	16	4.57(1.4-14.4)	**0.009***
	College/higher	7	15	8.57(2.4-30)	**0.001***
Place of residence	Rural	29	15	1	**1**
	Urban	16	22	2.65(1.1-6.5)	**0.03***
Employment status	Unemployed	42	28	1	**1**
	Employed	3	9	4.5(1.1-18)	**0.034***
History of HTN	No	39	35	1	**1**
	Yes	6	2	0.37(0.1-1.96)	**0.24***
History of sight problem	No	32	23	1	**1**

	Yes	13	14	1.49(0.6-3.7)	**0.39**
Family history of glaucoma	No	33	24	1	**1**
	Yes	12	13	1.49(0.6-3.7	**0.4**
History of eye injury	No	31	26	1	**1**
	Yes	14	11	1.06(0.4-2.7)	**0.89**

*Significant at p _ Value ≤0.25 candidate for multivariate analysis

Table 6: Cross tabulation and Multivariable regression analysis of glaucoma awareness score in the previous 6 months back to predictor variables Among Patients in selected public hospitals, Guragae zone, Ethiopia 2023

Variables	Category	Glaucoma awareness score		AOR(95%CI)	P-value
		Poor	Good		
Educational level	No formal education	24	6	1	**1**
	Primary/secondary	14	16	1.9(1.1-2.8)	**0.02**
	College/higher	7	15	2.06(1.3-3.1)	**0.001****
Place of residence	Rural	29	15	1	**1**
	Urban	16	22	0.68(0.24-1.8)	**0.45**
Employment status	Unemployed	42	28	1	**1**
	Employed	3	9	5.9(1.3-26)	**0.02****
History of HTN	No	39	35	1	**1**
	Yes	6	2	0.6(0.1-3.7)	**0.58**

*Significant at p _ Value ≤0.05

6. Discussion

This study aimed to find out level glaucoma awareness and associated factors affecting overall glaucoma awareness score among patients attending the ophthalmic outpatient's department of Gurage zone public hospitals. This discussion has been structured in line with objectives of the study:

Mean percentile of glaucoma awareness score were 44%, with 95% CI (32.44-55.56%) this study finding was congruent with North west Ethiopian study mean score awareness 0.42 (36), higher than study in Egypt15.5% (44), and Benin 31% (46), Malaysian 25% (47). This study finding is lower than study in Saudi Arabia which found level of glaucoma awareness among respondents were 67.5% (48).These differences could be due to methodological differences, socio-demographic variation, differences in technology, economic status between different states.

Multivariable regression analysis found that: Respondents who were college/higher achievers have 2.06 times more likely to have better glaucoma awareness score than participants who had no formal education AOR =2.06(1.3-3.1, 0.001) while participant's education level is primary or secondary level, their likelihood of having good glaucoma awareness score is 1.9 times higher than non-formal learners, AOR =1.9(1.1-2.8, 0.02),this study finding is consistent with study in Nigeria (30), Tanzania (49) Egypt (44), and this study finding was in line with study in England, which found higher educational level associated with awareness of glaucoma (50),.this finding is due to fact that having better education helps to learn and understand easily from different information sources.

Employed participants have 5.9 times more likely to have good glaucoma awareness than unemployed participants AOR=5.9(1.3-26, 0.02). This study is in line with study in Northern Ethiopia, Gish Abay AOR=3.53 [1.54, 8.06](51), and another study in Jimma(52), but this finding not supported by study in Ghana (53). Thus discrepancies could be due to differences in socio-demographic, economic and academic status of respondents.

7. Conclusion and Recommendation

7.1. Conclusion

The Level of awareness towards glaucoma was low Mean glaucoma awareness score were 44%, with 95% CI (32.44%-55.56%) in this population.

The level of awareness towards glaucoma in this study were strongly associated to Level of education of respondents (AOR =2.06(1.3-3.1, 0.001)). Respondents with lower levels of education were less aware, about glaucoma compared to their counterparts. The study findings imply the need for health education about the glaucoma to effectively aware clients, and prevent blindness due to the disease.

Glaucoma awareness, and knowledge around the disease have major part for early case detection, and avoidance of blindness from the disease, ophthalmic care professionals should work on rising awareness, and improving knowledge among societies, and the public at enlarge

7.2. Recommendation

- An efficient information, communication, and education strategy needs to be designed for early diagnosis, and treatment so as to prevent blindness related to glaucoma.
- **Guragae Zone health office**: The study findings stress the need for an efficient information, education, and communication (IEC) strategy to be designed by Zonal health office, And, SNNPR regional health bureau at large, to increase awareness of the community about glaucoma.
- **Zone health office**: upgrade primary health facilities to provide primary eye care service by skilled manpower so that early diagnosis, and treatment at large and mass screening with this condition.
- **Health facilities and hospitals**: should provide glaucoma related information in their health education schedule, regular eye examinations

- **Media:** The media should focus on less educated while disseminating health education about glaucoma, can play a vital role in bringing the suspects of glaucoma to screening centers and hence help an early diagnosis

Strength

- ✓ One of the strengths of this study is being community based, the study reveals that the actual concept of public awareness of glaucoma using face to face interview allowed for clarification of any misconceptions and misunderstanding of the given questions and reduce the frequency of missing items in questionnaires

Limitation

- ✓ The study used a cross-sectional study design which could assume an only temporal association between Awareness of glaucoma score to predictor variables.
- ✓ Study could have possibly of recall bias on the duration of glaucoma awareness.
- ✓ In addition to that the study uses the study population in the hospital, who had better Chance to hear about glaucoma or might pay more attention to hear and get information about eye disease could not represent the actual awareness in general public

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ANNEX

Questionnaires

Part1: Data on Socio demographic characteristics of the Study Subjects.

1. Age?	----------
2. Sex?	A, Male b. Female
3. What is your level of formal education?	a. unable to write and read b. able to write and read. primary d. secondary e, college and above
4. Where do you live?	a. Urban b. Rural
5. Have you ever been employed in the health care?	a. Yes b. No

Part2: Data on clinical characteristics of the Study Subjects.

1. Do you have diabetes?	a. Yes b. No
2. Do you have high blood pressure? (i.e., hypertension)	a. Yes b. No
3. Do you have cardiovascular disease?	a. Yes b. No
4. Do you have any eye injury before?	a. Yes b. No
5. Do you take steroids (as a pill, cream, nasal spray or eye drop)?	a. Yes b No
7. Dos your family have glaucoma?	a. Yes b.No

Part 3: Awareness towards Glaucoma.

Questions	Possible responses
1. Have you ever heard of an illness called glaucoma?	[0] No [1] yes
2,If yes, Question 1 above, where did you hear it from?	[1] Mass media [2] Relatives [3] Friend [4] Health worker [5] Other_____
3. Glaucoma results in blindness?	[0] No [1] Yes
4. Looking directly at the sun is not causes glaucoma.	[0] No [1] Yes
5. Blindness from glaucoma is not curable.	[0] No [1] Yes
6. Signs and symptoms of glaucoma are itchy and swollen eyes.	[0] no[1] Yes
7. The risk of developing glaucoma increases with age.	[0] No [1] Yes
8. Glaucoma limits the ability to see a wider spatial environment.	[0] No [1] Yes

9. Glaucoma can never be detected unless blindness occurs.	[0] No [1] Yes
10. Glaucoma could be transited by heredity.	[0] No [1] Yes

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APPROVAL SHEET

TITLE:

Submitted by [Students]:

1. _____ _____ _____

Student Name Signature Date

2. _____ _____ _____

Student Name Signature Date

3. _____ _____ _____

Student Name Signature Date

Approved by [Advisor's]:

_____ _____ _____

Advisors' Name Signature Date

_____ _____ _____

Advisors' Name Signature Date

Approved by [Board of Examiners]:

_____	_____	_____
Examiners' Name	Signature	Date
_____	_____	_____
Examiners' Name	Signature	Date