ADDIS ABEBA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF NURSING AND MIDWIFERY
DEPARTMENT OF NURSING

PREVALENCE AND ASSOCIATED FACTORS OF VISUAL IMPAIRMENT AMONG INDIVIDUALS AGED 40 YEARS AND ABOVE IN THE SELECTED MILITARY HOSPITALS IN ADDIS ABABA, 2025

BY MELES GIZACHEW (BSc)

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF NURSING AND MIDWIFERY, DEPARTMENT OF NURSING IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR MASTERS OF SCIENCE DEGREE IN ADULT HEALTH NURSING.

JUNE 10, 2025
ADDIS ABABA, ETHIOPIA

ADDIS ABEBA UNIVERSITY
COLLEGE OF HEALTH SCIENCES
SCHOOL OF NURSING AND MIDWIFERY
DEPARTMENT OF NURSING

PREVALENCE AND ASSOCIATED FACTORS OF VISUAL IMPAIRMENT AMONG INDIVIDUALS AGED 40 YEARS AND ABOVE IN THE SELECTED MILITARY HOSPITALS IN ADDIS ABABA, 2024/25

BY MELES GIZACHEW (BSc)

ADVISORS: ZELEKE ARGAW, ASSISTANT PROFESSOR

AKLIL HAILU, ASSISTANT PROFESSOR

BY: MELES GIZACHEW (BSc)

A THESIS TOBE SUBMITED TO THE SCHOOL OF NURSING AND MIDWIFERY, COLLEGE OF HEALTH SCIENCES GRADUATE STUDIES ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTERS OF SCIENCE IN ADULT HEALTH NURSING

JUNE 10, 2025
ADDIS ABABA, ETHIOPIA

APPROVAL BY THE BOARD OF EXAMINATION

ADDS ABABA UNIVERSITY, COLLEGE HEALTH SCIENCES, SCHOOL OF NURSING AND MIDWIFERY, DEPARTMENT OF NURSING

I hereby certify that I have read and evaluate this Thesis entitled "Prevalence and Associated Factors of Visual Impairment Among Individuals Aged 40 years and Above in Selected Military Hospitals in Addis Ababa, Ethiopia, 2025" I recommend that it is submitted as fulfilling the thesis requirement.

Submitted by:

Meles Gizachew	_____	_____
Principal investigator	Signature	Date

This thesis work has been submitted for examination with my approval as an advisor.

Approved by:

Zeleke Argaw	_____	_____
Major advisor	Signature	Date
Aklil Hailu	_____	_____
Co-advisor	Signature	Date
Name	_____	_____
Examiner	Signature	Date
Name	_____	_____
Department head	Signature	Date

STATEMENT OF DECLARATION

By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, data analysis, and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources used in this document. Every effort has been made to avoid plagiarism in the preparation of this thesis.

This thesis is submitted to Addis Ababa University, College of Health Sciences, School of Nursing and Midwifery, department of Nursing in partial fulfilment of the requirement for Masters of Science degree in Adult Health Nursing. The thesis is deposited in the Addis Ababa University Digital Library and is made available to local, national and international scientific community.

Brief quotations from this thesis may be used without special permission provided that accurate and complete acknowledgement of the source is made. Requests for permission for extended quotations from, or reproduction of, this thesis in whole or in part may be granted by the Head of the Department or all advisers of the thesis when in his or her judgment the proposed use of the material is in the interest of scholarship and publication. In all other instances, however, permission must be obtained from the author of the thesis.

Meles Gizachew	_____	_____
Principal investigator	Signature	Date
Zeleke Argaw	_____	_____
Major advisor	Signature	Date
Aklil Hailu	_____	_____
Co-advisor	Signature	Date

ACKNOWLEDGMENTS

First, I would like to express my heartfelt gratitude to the Ethiopian Defence University College of Health Sciences for sponsoring my pursuit of a Master's degree (MSc) and to Addis Ababa University College of Health Sciences, School of Nursing and Midwifery, for providing me with this invaluable opportunity.

Next, I am deeply thankful to my advisors, Mr. Zeleke Argaw and Sr. Aklil Hailu, both assistant professors, for their unwavering guidance, support, and constructive feedback throughout the research process.

My sincere appreciation also goes to the library staff for their assistance and patience in helping me access the necessary literatures.

Finally, I would like to extend my gratitude to the medical directors of AFCSH and FPH for granting me permission to conduct my study in both hospitals. I am also grateful to the supervisors, data collectors, and participants for their invaluable contributions to this research.

LIST OF ACRONYMS AND ABBREVIATIONS

AFCSH	Army force comprehensive specialized hospital
AMA	Age-related degeneration
BCVA	Best corrected macular degeneration
DM	Diabetes mellitus
DR	Diabetic retinopathy
ERD	Eye related disease
FPH	Federal police hospital
HTN	Hypertension
IQR	Interquartile range
IRB	Institutional Review Board
NHATS	National health and aging trends study
RE	Refractive error
RH	Referral hospital
SPSS	Statistical Product and Service Solutions
SSA	Sub-Saharan Africa
URE	Uncorrected refractive error
VI	Vision impairment

TABLE OF CONTENTS

ACKNOWLEDGMENTS
iv
LIST OF ACRONYMS AND ABBREVIATIONS v
TABLE OF CONTENTS vi
LIST OF TABLES viii
ABSTRACT x
1.1. Background information 1
1.2. Statement of the problem 3
1.3. Significance of the study 5
2. LITERATURE REVIEW 6
2.2. Associated factors of visual impairment 8
2.2.1. Demographic factors 8
2.2.2. Health-related factors (eye and chronic diseases) 9
2.2.3. Lifestyle, attitude, and awareness 10
2.3. Conceptual frame work 11
3. OBJECTIVES 12
3.1. General objectives 12
3.2. Specific objectives 12
4. METHODS AND MATERIALS 13
4.1. Study area 13
4.2. Study period 14
4.3. Study design 14
4.4. Populations 14
4.4.1. Source populations 14
4.4.2. Study subjects 14
4.5. Eligibility criteria 14
4.5.1. Inclusion criteria 14
4.5.2. Exclusion criteria 15
4.6. Sample size determination, sampling technique, and procedure 15
4.6.1. Sample size determination 15
4.6.2. Sampling technique and procedure 16

4.7. Variable 17
4.7.1. Dependent variable 17
4.7.2. Independent variable 17
4.8. Operational definition of terms 18
4.9. Data Collection tools and procedures 18
4.9.1. Data collection tools 18
4.10. Data quality assurance 20
4.11. Data processing and analysis 20
4.12. Ethical considerations 21
4.13. Dissemination and Utilization of Results 21
5. **RESULT** 22
6. DISCUSSION 39
7. STRENGTH AND LIMITATION 42
8. **CONCLUSION AND RECOMMENDATION** 43
9. REFERENCES 44
10. APPENDIX 47

LIST OF TABLES

Table 1.Proportional allocation of sample size 16
Table 2. Demographical characteristics of the participant individuals aged 40 years and above in selected military hospitals in Addis Ababa, Ethiopia, 2025. 22
Table 3. Health history characteristics of the participant individuals aged 40 years and above in selected military hospitals in Addis Ababa, Ethiopia, 2025. 23-24
Table 4. Lifestyle and attitude characteristics of the participant individuals aged 40 years and above in selected military hospitals in Addis Ababa, Ethiopia, 2025, 25
Table 5. Socio-environmental characteristics of the participant individuals aged 40 years and above in selected military hospitals in Addis Ababa, Ethiopia, 2025, 27
Table 6. Distribution of Visual Impairment Related to Demographic Factors among Individuals Aged 40 years and Above in Selected Military Hospitals in Addis Ababa 29
Table 7. Distribution of Visual Impairment Related to Health History Factors among Individuals Aged 40 years and above in Selected Military Hospitals in Addis Ababa 31-32
Table 8. Distribution of Visual Impairment Related to Lifestyle and Attitudinal Factors among Individuals Aged 40 years and Above in Selected Military Hospitals in Addis Ababa 33
Table 9. Distribution of Visual Impairment Related to Socio-environmental Factors among Individuals Aged 40 years and above in Selected Military Hospitals in Addis Ababa 35
Table 10. Distribution of Visual Impairment Related to symptoms and impact of visually impaired patients among aged 40 years and above 36
Table 11. Bivariate and multivariate analysis for the occurrence of V-impairment among those aged 40 years and above in selected military hospitals 38

LIST OF FIGURES

Figure 1. Conceptual framework on prevalence and associated factors of vision impairment among forty years and above 11

Figure 2. Schematic sampling presentation of the sampling procedure to assess the prevalence and association factors of visual impairment among those aged 40 years and above at selected military hospitals, Addis Ababa, Ethiopia. 17

Figure 3. Prevalence of visual impairment among individuals aged 40 years and above in selected military hospitals in Addis Ababa 28

ABSTRACT

Background: Visual impairment among older age groups is a significant public health concern. Studies indicate that approximately **10-20%** of individuals aged 40 years and older experience some form of visual impairment globally. Visual impairment is influenced by age-related conditions, lifestyle factors, diabetes, hypertension, education, and occupational exposure to visual stressors, with older adults at higher risk due to natural aging and lifestyle changes.

Objectives: to assess prevalence and associated factors of visual impairment among individuals aged 40 years and above in the selected military hospitals in Addis Ababa, Ethiopia, 2025.

Methods: A cross-sectional study was conducted in selected hospitals from January 20 to February 20, 2025, involving 213 participants. Data was collected through structured questionnaires and vision assessment tools. Descriptive analysis summarized demographic characteristics, while chi-square tests assessed associations between variables and visual impairment. Bivariate and multivariate logistic regression analysis identified significant predictors. A p-value of <0.05 was considered statistically significant.

Results: The study involved 213 participants, 100% response rate, aged 40-92 years, with a mean age of 56 and a median of 53.6%. 63% were men, and 46.5% were retired. Most lived in urban areas, with 193 (90.6%) in urban areas. The study found that 33.8% of participants had cataracts, with hypertension(29.1%) and diabetes(25.8%) being other chronic conditions. 48.4% had normal vision, and 46.9% had their eyes examined in the current year. The overall prevalence of visual impairment among participants aged 40 and above was found to be 51.6%, age, cataracts, glaucoma, refractive errors (RE), diabetes mellitus (DM), difficulties in watching television, and cigarette smoking were significantly associated with the occurrence of VI.

Conclusion:. The study identified several significant factors associated with visual impairment, including age, cataracts, glaucoma, refractive errors (RE), diabetes mellitus (DM), difficulties in watching television, and cigarette smoking. These findings highlight the critical need for targeted interventions and comprehensive eye care strategies for this demographic.

Key terms: Prevalence, Visual impairment and associated factors

INTRODUCTION

1.1.Background information

The World Health Organization(WHO) indicates that visual impairment (VI) is the one in which the individual's vision level is determined from 20/70 to 20/200 with the best possible correction; in light disability, to 20 feet to see what a healthy person can see from a distance of 200 feet; in deep disability. As for the visual field, the person with a visual impairment has a visual field of 20 degrees or less, while the visual field of a normal person ranges between 160 degrees and 170 degrees (1-3).

Conventional visual acuity tests, which are usually evaluated with a Snellen chart, divide vision into a number of classifications that can vary by nation and organization. 20/20 is considered normal vision, signifying unimpaired visual acuity. Other classifications of low vision include mild low vision, which falls between 20/30 and 20/60; moderate vision, which falls between 20/70 and 20/160; and severe low vision, which is frequently referred to as legal blindness and includes visual acuity between 20/200 and 20/400. Significant impairment in visual function is indicated by profound low vision, which is defined as 20/500 and above(2).

The prevalence of visual impairment increases sharply with age. Studies indicate that about 10-20% of individuals aged 40 years and above experience some form of visual impairment. This statistic is expected to rise due to aging populations and increasing life expectancy globally. As the demographic of older adults grows, understanding the prevalence of visual impairment becomes critical for public health planning(2).

Several factors contribute to the risk of visual impairment in older adults, including demographic factors (age, sex, occupation, residence, educational level, and marital status) health conditions (e.g., glaucoma, cataract, refractive error, diabetes, and hypertension). lifestyle choices (e.g., smoking and high alcohol consumption); and attitude and awareness. These interconnected risk factors necessitate a comprehensive approach to prevention and management respectively(2) (4, 5).

Visual impairment significantly affects the quality of life for older adults, leading to challenges in daily activities, social isolation, and increased risks of depression(5). Additionally, it can reduce independence and increase the likelihood of falls and other injuries. Addressing these issues is vital for improving the overall well-being of affected individuals(6).

Understanding the prevalence and associated factors of visual impairment is essential for healthcare providers and policymakers. It informs the development of targeted screening

programs and preventive measures. Public health strategies should focus on increasing awareness about the importance of regular eye examinations, improving access to eye care services, and implementing community outreach initiatives(1).

1.2.Statement of the problem

Visual impairment, also known as visual impairment or vision loss, refers to a significant decrease in the ability to see, which cannot be fully corrected with glasses, contact lenses, medication, or surgery. The nature, signs, and symptoms of VI can vary widely depending on the underlying cause and severity (2).

A plenty of factors, including ERD-like cataracts, can impair vision. Damage to the optic nerve results from diabetic retinopathy (DR) and glaucoma. Trauma or eye injuries may cause long-lasting impairment or gradual blindness (4).

VI can detect through various symptoms, such as blurred vision, which makes objects appear fuzzy or not clear, and difficulty seeing at night, characterized by trouble in low-light conditions and shine from lights. Individuals may experience a blind spot in their visual field, challenges with color perception, and double vision, where two images of one object are seen. Frequent eye strain. Sensitivity to bright light and changes in depth perception can further complicate daily activities such as driving or walking. Additionally, frequent headaches may occur due to eye strain, and some individuals may struggle to recognize familiar faces at a distance. (2)

Globally, at least 2.2 billion people have a near or distance vision impairment. In at least 1 billion of these, VI could have been prevented or is yet to be addressed. 237 million people are thought to have moderate to severe distance vision impairment in 2020; 55% are women, and 89% live in low- and middle-income countries. Thirty-nine million people are believed to be blind globally in 2020; this is set to increase to one hundred fifteen million people in 2050. The leading causes of vision impairment and blindness at a global level are REs, cataracts, DR, and glaucoma. It is estimated that globally only 36% of people with distance vision impairment due to cataracts have received access to an appropriate intervention (7, 8). VI poses a huge global financial burden, with the annual global cost of productivity valued to be US$ 411 billion. (14) Vision loss can affect people of all ages; Nevertheless, most people with VI and blindness are over the age of 50 years (9).

According world health organization (WHO) Africa region 10 October2024 VI is a significant health problem in the African region. The major eye conditions include cataracts, uncorrected RE, glaucoma, and DR, approximately 26.3 million people in the African region have a form

of VI. Of these, 20.4 million have low vision and 5.9 million are estimated to be blind. It is estimated that 15.3% of the world`s blind population reside in Africa(10).

More than 80% of blindness has been preventable according to the meta-analysis in 2022 in Ethiopia. The prevalence of blindness in this study it estimated 1.18% (13.9) million blind. Blindness in Ethiopia is among the foremost public health difficulties of the country(11). So, it can cause a huge economic and social impact for the affected persons and to the community, and the country at large. Thus, to address this backlog of blindness, it demands up-to-date strategies and its implementation, preventive and curative eye care service with affordable and accessible interventions, and evidence-based advocacy to awaken all concerned bodies who are working to discourse avoidable blindness.

The research aims to assess the prevalence of visual impairment among individuals aged 40 and above in selected military hospitals, identifying specific risk factors that contribute to this condition within the military population. Furthermore, it seeks to search how lifestyle choices and chronic health conditions influence the incidence of VI in older adults in military setting. By addressing these questions, the study intends to provide valuable insights that can notify targeted interventions and improve eye health among military personnel, families and veterans.

1.3.Significance of the study

The prevalence and associated factors of VI among individuals aged 40 years and above in selected military hospitals have significant implications for military health systems, public health programs, and policy-making. Attempting to better respond to the needs of elderly citizens, its results can refine vision-screening practices, guide resource allocation, and shape community outreach activities. The information can also be used by health professionals for improving clinical practice and generating patient education materials, which will eventually result in the earlier diagnosis and better management of VI.

Policy-makers will be provided with evidence-based information to guide health planning at a strategic level, health care professionals will be better placed to react to eye health, and older people will gain more access to treatment as a result of the findings.

Researchers can utilize this study as a base to investigate other areas of vision health in old age, fostering interdisciplinary cooperation in addressing the challenges of VI. Overall, this study can optimize the eye care procedures in civilian and military settings, thereby ensuring the quality of life of the elderly.

2. LITERATURE REVIEW

This chapter reviews various literatures to examine previous research on the prevalence and associated factors of eye impairment among individuals aged 40 years and older.

2.1.Prevalence of visual impairment

VI is a major public health concern, particularly among individuals aged 40 years and above. This demographic is at greater risk for several ocular conditions, such as RE, cataracts, and glaucoma (2, 4, 5).

There is considerable difference in the reasons for VI between and within countries according to the availability of eye care services, their affordability, and education of the population. For instance, the proportion of VI attributable to un-operated cataract is higher in low- and middle-income countries. In high-income countries, glaucoma is more common(12, 13).

In terms of local variations, the prevalence of distance VI in low- and middle-income regions is estimated to be 4 times higher than in high-income regions(12) With regards to near vision, rates of unaddressed near VI are estimated to be greater than 80% in western, eastern and sub Saharan Africa, while comparative rates in high income regions of north America, Australasia, western Europe, and of Asia-Pacific are reported to be lower than 10%. (9) A number of studies have stated varying prevalence rates of VI among individuals aged 40 and above. According to the world health organization (WHO), approximately 285 million people worldwide are visually impaired, with an important proportion being over the age 40 (1).

The study conducted in Sri Lanka in 2018 on the medical officer of health area revealed that the global prevalence of VI among individuals aged 40 and above was 21.3% (14, 15). Another longitudinal survey conducted in 2022, which covered 450 villages and settlements across 150 countries and districts in china, reported a prevalence rate of 12.45% for individuals aged 45 and above. (6) Additionally, a community based study conducted in New Delhi, India, in 2015 found that the prevalence of VI in the urban population was 12.6%(16).

The prevalence of visual impairment (VI) among individuals aged 40 and above in Africa is markedly greater than in western countries, mostly due to factors such as economic gaps, educational access, and the availability of healthcare services. This makes VI an important public health issue across the African region(10).

A community-based household survey conducted in Ghana in 2015, the earliest study conducted on this topic, revealed that 1.07% of Ghanaians experienced severe visual impairment(17).

In a comprehensive context, a systematic review and meta-analysis published in 2015 focused on sub-Saharan Africa and included data from 24 countries across 25 studies. This broader investigation found that the prevalence rate of VI in persons 50 years and above was approximately 9.59%. These findings from these studies reveal the need for targeted interventions and services to address the high levels of vision loss in the African population, particularly in older adults (18).

The prevalence of VI in Ethiopia has been the subject of few numbers of studies. With varying results in varying regions. In a cross-sectional community outreach study conducted in northwest Ethiopia in 2023, visual impairment prevalence was 41.8%(19). A cross-sectional community study conducted in southern Ethiopia in 2022 in participants 40 years and older had a prevalence of 36.95%.

Furthermore, an institution-based chart review conducted in Gondor, northwest Ethiopia, in June 2015 among those aged 15 and above found a prevalence of VI at 15.3%.(20) Finally, a community-based cross-sectional analysis conducted in Debre Birhan, North Shewa, in 2020 among those aged 18 and above reported a prevalence of VI at 16.8% (21).

Prevalence of VI is not evenly distributed geographically and across countries, with Africa, particularly sub-Saharan Africa, bearing greater prevalence. Economic disparity and lack of access to healthcare exacerbate the problem. Very high prevalence rates in Ethiopia, as high as 41.8%(19). necessitate targeted interventions. Comprehensive eye care programs and policies that are inclusive are necessary to reduce visual impairment burden, improve quality of life for individuals, and promote general public health and economic outcomes.

2.2.Associated factors of visual impairment

Studies have indicated that demographic factors (age, sex, educational level, and income); health-related factors (cataracts, glaucoma, diabetic retinopathy, and hypertension); and lifestyle factors (cigarette smoking, excessive use of alcohol, attitude, and awareness) are associated with visual impairment(2-5, 7, 22).

2.2.1. Demographic factors

Age, sex, educational level, income, marital status, and residence are the association factors for VI indicated by various studies(13, 22).

The study conducts a secondary data analysis of the 2023 National Health and Aging Trends Study (NHATS) in the United States, revealing that various forms of visual impairment (VI) correlate significantly with advanced age, lower educational attainment, and reduced income levels(23).Additionally, geographical disparities in the prevalence of VI within China have been identified, underscoring the existence of such variations across different regions. Age has been recognized as a contributing factor to VI in this context(5). A study conducted in 2021 in the USA revealed that VI occurs more frequently in women, largely because they tend to live longer than men, particularly in the context of various ocular diseases(24).

The study conducted in India elevated rates of visual impairment among older adults who are currently unmarried, less educated persons, and urban residents. These findings can inform targeted strategies aimed at engaging high-risk groups effectively(16).

Despite the limited number of studies conducted in Africa, existing research has identified demographic factors associated with visual impairment in countries such as Ghana, Gambia, and Togo. Notably, these studies have revealed significant gender differences in the burden of vision difficulties across these nations. Furthermore, observable disparities were found in how age, educational attainment, marital status, and geographical region correlate with reported vision difficulties, underscoring the complex interplay of these demographic factors in influencing visual health outcomes in the region(25).

In Ethiopia also a limited number of studies were conducted. a community-based cross-sectional analysis conducted in southern Ethiopia on this cross-sectional study, the prevalence of visual impairment among older adults was relatively high, and more than three-fifths of participants had unilateral visual impairment. Age, marital status, and occupation, educational status was significantly associated with visual impairment (22). The other study conducted in Gondar teaching hospital in 2015, the study revealed that Sex and age, were significantly associated with visual impairment(20).

2.2.2. Health-related factors (eye and chronic diseases)

In addition to demographic factors, various eye diseases and chronic health conditions significantly contribute to VI. Related or common eye diseases such as cataracts, glaucoma, and REs are prevalent causes of vision difficulties. Chronic diseases, including diabetes and hypertension, also play a critical role in visual health(7).

Globally, most studies have explored these associations. For example, a Chinese population study in 2022 revealed that conditions of hypertension and diabetes, chronic diseases, were linked to an increased risk of VI. (6) In the same way, in India, research in 2023 revealed higher rates of VI among people suffering from hypertension. These studies' findings highlight the significance of pointing out high-risk groups in public health strategies targeted at preventing and managing visual impairment (26).

Regionally, in Africa, a few studies have been conducted on the associated factors (eye and chronic disease) of VI. A study conducted in South Africa in 2024 examined health-related issues linked to VI, identifying uncorrected refractive error (URE), cataracts, and glaucoma as the leading causes. These studies suggest an urgent need for improved strategies to address both reversible and avoidable VI, according to their findings(27).

Locally, in Ethiopia, studies conducted highlight the significant burden of visual impairment in the country, emphasizing different causes across regions depending on the findings.

For instance, in 2023 in Northwest Ethiopia, it was discovered that cataracts and uncorrected refractive errors were a leading cause of VI. This draws attention to the intrinsic for public health interventions targeting these specific conditions through awareness, screening and management programs(19).

An institution-based cross-sectional study at St. Paulo's Hospital millennium medical college in Addis Ababa revealed that cataracts and glaucoma were significantly associated with low vision(28).

According to a study done in the Arbaminch zurya area of south Ethiopia in 2022, RE are the main cause of VI. To lessen the burden of URE, this study emphasizes the necessity of easily accessible vision correction measures, i.e., eyeglasses and routine eye check-ups(22).

Generally, these studies reveal a multifaceted problem of VI in Ethiopia with causes depending on place. In their efforts towards improving eye care services in the country as a whole, they reveal that there is a demand for focused programs against preventable and treatable causes of VI and broader public health interventions.

2.2.3. Lifestyle, attitude, and awareness

The risk factors for vision impairment (VI) in people 40 years and older are cigarette smoking and heavy alcohol use. Recent research has shed light on these relationships.

A 2022 Chinese study identified alcohol consumption as a risk factor for visual impairment, discussing that people who drink alcohol have a higher likelihood of developing VI (6).

Similarly, an Indian study in 2023 established a strong relationship between cigarette smoking and a range of vision abnormalities, including glaucoma and cataracts. The mechanisms through which smoking negatively affects the eye tissues include processes such as oxidative stress, inflammation, and vascular dysfunction. In particular, smoking has been most closely associated with glaucoma, which is characterized by gradual optic nerve damage(26).

Cumulatively, these research studies emphasize the significant role played by lifestyle variables such as alcohol consumption and smoking in shaping vision health among elderly persons.

2.2.4. Socio-Environmental Factor

Environmental factors associated with visual impairment include primary work environment, residence, access to healthcare facilities, the use of eye protection, and prolonged exposure to screens. And social factors associated with visual impairments are living arrangements, feelings of social support, and participation in social activities (29).

2.3.Conceptual frame work

Literatures shows that concepts that were directly and indirectly related to the outcome variable of the study. Among these, demographic factors, health related factors, life style, and attitude are expected to affect the dependent variable of the study(2-5, 7).

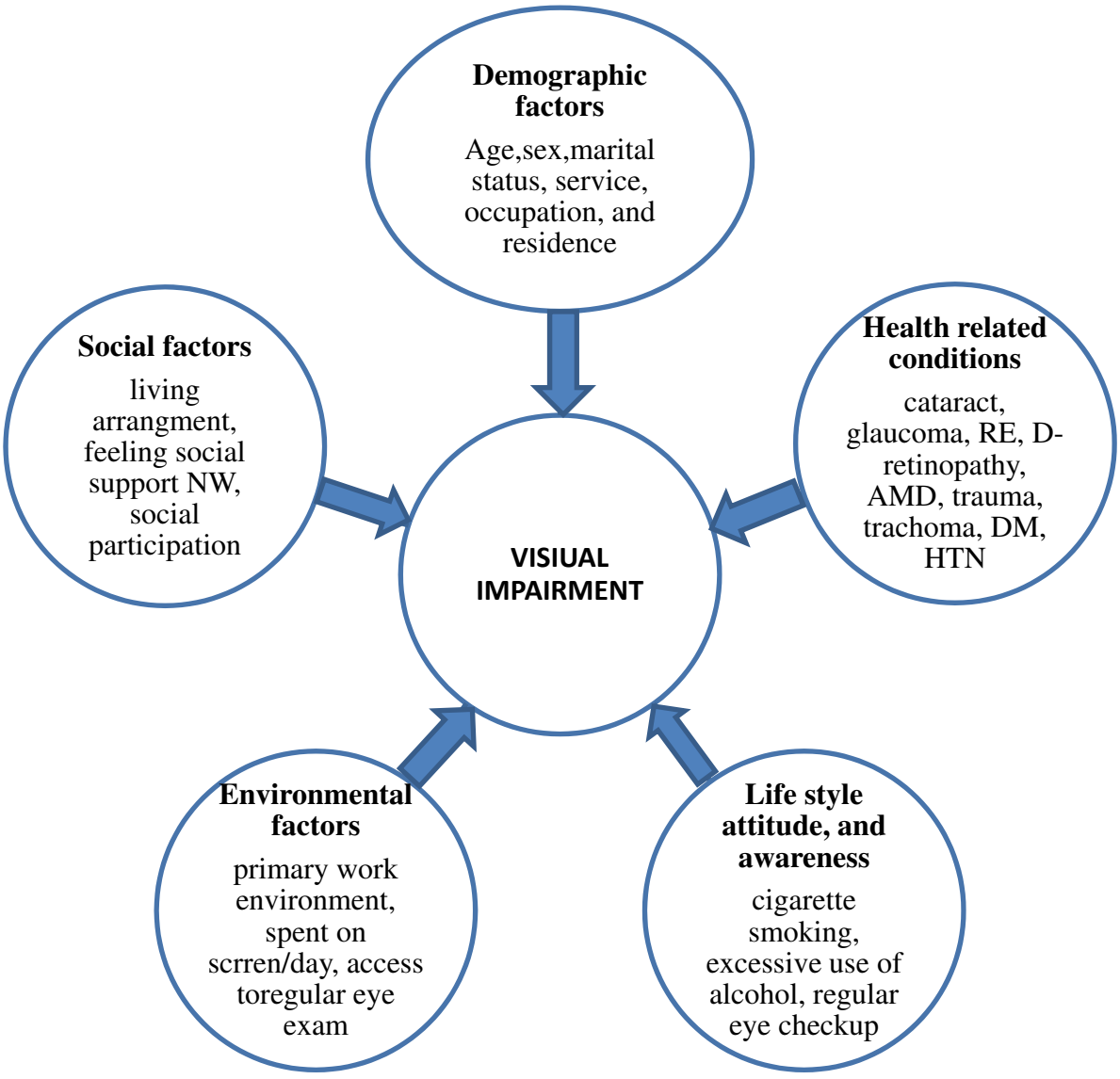


Fig1. Conceptual framework on prevalence and associated factors of vision impairment among 40 years and above

3. OBJECTIVES

3.1.General objectives

To assess prevalence and associated factors of visual impairment among individuals aged 40 years and above in the selected military hospitals, Ethiopia, 2025

3.2.Specific objectives

To determine the prevalence of visual impairment among individuals aged 40 years and above in military hospitals, Ethiopia, 2025

To assess factors associated with visual impairment among individuals aged 40 years and above in the selected military hospitals in Ethiopia, 2025

4. METHODS AND MATERIALS

4.1.Study area

The study was conducted in Armed Forces Comprehensive Specialized Hospital (AFCSH) and the federal police hospital located in Addis Ababa, Ethiopia.

Addis Ababa is the capital and largest city of Ethiopia. It is a major cultural, artistic, financial, and administrative center of Ethiopia and is considered one of Africa's major capitals. Addis Ababa is located and surrounded by hills and mountains in the geographic center of the country. According to the Central Statistical Agency (CSA), the population of Addis Ababa is estimated to be 5,703,630 in 2024. The city's population has grown from an estimated 15,000 in 1888 to more than 3.6 million in 2020. However, the growth rate has declined in recent decades, from 6.9% annually from 1961–1962 to 2% from 2007–2013(30).

The Armed Forces Comprehensive Specialized Hospital is located in Addis Ababa, Ethiopia. It is a prominent health care organization delivering specialized medical services. It was founded with an aim to deliver high-quality healthcare to both armed forces personnel and civilians; this hospital offers advanced facilities and treatments. This medical center offers specialized medical care for conditions like cardiology, oncology, neurology, orthopedic, and ophthalmology with advanced treatments. It also offers emergency and trauma care services that are equipped with immediate medical care and surgical procedures with modern operating theaters, advanced technologies, and a skilled team. This center offers a wide range of diagnostic services like MRI, CT scan, and X-ray, pathology, and microbiology lab services with additional maternity and pediatric services(31).

Federal Police Hospital is in Lideta Sub City, Ethiopia. This hospital primarily provides treatments for members of the federal police force and their families. It was founded for law enforcement and offers a range of specialized medical services with an aim to provide emergency services and routine healthcare. This hospital has specialized medical services, advanced technologies, and state-of-the-art facilities for health conditions like surgery, orthopedics, internal medicine, ophthalmology, and more. It serves as a referral center for complicated medical cases. Each federal police employee has a set of health services, policies, and insurance facilities. Depending on the severity of the health condition the insurance will be provided fully or partially(32).

4.2.Study period

The study was conducted from January 20 to February 20, 2025.

4.3.Study design

An institution-based cross-sectional study design was conducted.

4.4.Populations

4.4.1. Source populations

The study were included members of the Ethiopian military Forces, including veterans who have served across the country, many of whom were located in Addis Ababa; as well as the families of military personnel.

4.4.2. Study subjects

The study subjects consisted of randomly selected military personnel, veterans, and their families aged 40 years and older who visited the eye units of the selected hospitals during the study period.

4.5.Eligibility criteria

4.5.1. Inclusion criteria

Participants aged 40 years and older who attended the selected military hospitals during the data collection period and provided informed consent were included in the study.

4.5.2. Exclusion criteria

- Participants who expressed disinterest in the study were excluded from participation to ensure that all included individuals were willing and motivated to contribute to the research. and
- Patients who had already been interviewed during a previous visit and were undergoing follow-up during the data collection period were excluded from the study.

4.6.Sample size determination, sampling technique, and procedure

4.6.1. Sample size determination

A sample size of approximately 213 participants was determined based on an estimated prevalence of visual impairment observed in similar populations. This calculation was made with a confidence level of 95% and a prevalence rate of 15.3%, as reported in a study conducted in Gondor in 2015 (23).

$n_0 = [z^2 * p (1-p)] / e^2$

Where

z = z-score (1.96)

e = margin of error (5%)

p = prevalence (15.3%)

$n_o = (1.96)^2 * 0.153(1 - 0.153)\ 0.153) / (0.05)^2$

$n_0 = 239.7$

$n_0 = 240$

Correction formula for less than 10,000

$$n = 1 + \frac{n_0 - 1}{N} = 240 / 1.12849 = 212.7$$

n = 213

4.6.2. Sampling technique and procedure

There are two military hospitals located in Addis Ababa: the Army Forces Comprehensive Specialized Hospital and the Federal Police Referral Hospital. These hospitals were selected using a purposive sampling method. The total sample size was then proportionally allocated to each selected hospital. According to the respective hospitals' monthly reports for October 2024, the Army Forces Comprehensive Specialized Hospital recorded a total of 1,048 adult patients aged 40 and above, while the Federal Police Referral Hospital reported 812 such patients.

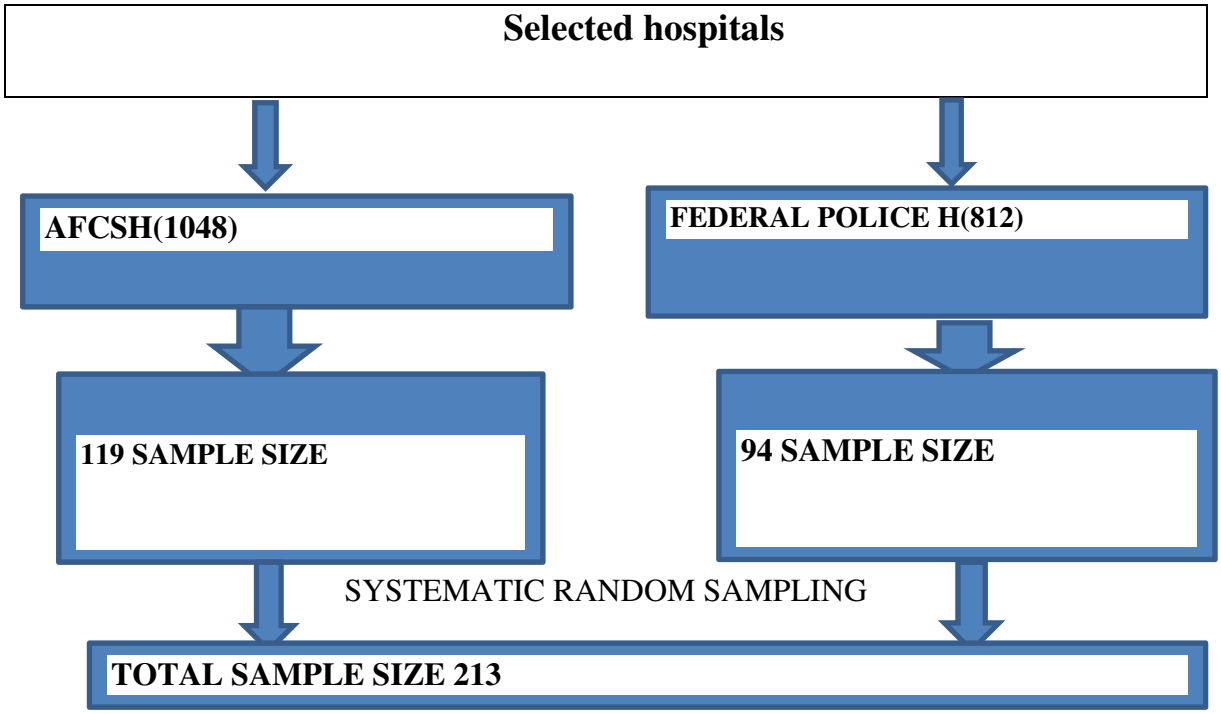
Table 1. Number of Participants Obtained from Selected Hospital Patients' Flow Data on October 2024

SN	Study area	Patient attended on October	Rate	Sample size
1	AFCSH	1048	56%	119
2	Federal police H	812	44%	94
Total		1860	100%	213

*Proportional allocation of sample size

To gather the necessary information from adult patients aged 40 and above at AFCSH and the Federal Police Hospital during the study period, a systematic random sampling method was employed. Medical record numbers were recorded to avoid repetition. The sample size was calculated based on the monthly attendance figures from the outpatient department (OPD) of the selected hospitals.

For this study, the kth value for selecting adult patients was set at 8. This means that from the attending of patients, every 8^{th} adult patient aged 40 and above was chosen.



Fig,2. Schematic representation of the sampling procedure to assess the prevalence and association factors of visual impairment among aged 40 years and above at selected military hospitals, Addis Ababa, Ethiopia.

4.7.Variable

4.7.1. Dependent variable

Visual impairment **(VI)**

4.7.2. Independent variable

- **Demographic factors (age,** sex, occupation, level of education, marital status, residence, and monthly income).
- **Health-related factors**: (cataract, glaucoma, refractive error, trauma, diabetic retinopathy, and hypertension)
- **Lifestyle factors, attitude, and awareness (**cigarette smoking, excessive use of alcohol, regular eye check-ups)
- **Environmental factors:** (primary work environment, time spent on screen per day, access to regular eye care, and using protective eyewear).
- **Social factors:** (living arrangement, feeling of social network, and social participation).

4.8.Operational definition of terms

- Normal vision is the one in which the individual's vision level is determined by 20/20. (1, 2, 3)
- Mild low vision is the one in which the individual's vision level is determined from 20/30 to 20/60. (1, 2, 3)
- Moderate low vision, which falls between 20/70 and 20/150 (1, 2, 3)
- Severe low vision, which is frequently referred to as legal blindness and includes visual acuity between 20/200 and 20/400. (1, 2, 3)
- Profound low vision, which is defined as 20/500 and above. (1, 2, 3)
- Intraocular pressure (IOP) -The normal range for intraocular pressure (IOP) is 10–21 millimeters of mercury (mmHg). (1, 2, 3)
- Ocular hypertension - Higher than 21 millimeters of mercury (mmHg) intraocular pressure without damage to the optic nerve(33).
- Glaucoma - Higher than 21 millimetres of mercury (mmHg) intra ocular pressure with damage to the optic nerve (33).

4.9.Data Collection tools and procedures

4.9.1. Data collection tools

The tool developed from the insights gained through four comprehensive studies conducted in Ethiopia aims to address specific challenges identified within the local context. By synthesizing findings from diverse research methodologies, the tool integrates cultural, social, and economic factors unique to the Ethiopian landscape. Ultimately, this tool reflects a deep understanding of the needs and aspirations of the Ethiopian population, promoting sustainable solutions that are both relevant and impactful. (21, 22, 23, 24). The questionnaire was first developed in English. Then translated into Amharic and then back to English to check its consistency. The questionnaires had six sections. The 1st section was composed of seven items that assess the demographic characteristics of participants. The 2nd section composed of eight items that assess related health problems. The 3rd section composed of seven items to assess the life style, attitude and awareness, the 4th composed of five items to assess environmental factors, the 5th section composed of six items to assess social factors, the last section composed of seven items to assess the symptoms and impacts of visually impacted patients.

An interviewer-administered closed-ended questionnaire was utilized and the data was taken from the participant before contact with the doctor, then related health history was taken from the medical chart, and after Snellen chart examination according their result the participant were continue some interview, for visually impaired.

4.9.2. Data collection procedures

The study involved four data collectors, two of whom were ophthalmic nurses at AFCSH and two at the Federal Police Hospital, and two supervisors who were recruited from the outpatient department. A one-day training was given by the principal investigator on the study objectives, data collection method, content relevance, confidentiality of information, and the rights of participants. Eligible participants were recruited from the outpatient departments of selected hospitals, and those who consent to participate were included in the study using a systematic random sampling method. Data was collected through face-to-face interviews using questionnaires, and the selection and inclusion of patients were continue until the required number of participants is reached for the study.

Physical examination and related disease conditions were conducted by the ophthalmologists, with the help of a data collector to ensure accuracy and reliability of data collected. Health related conditions like glaucoma, cataract, AMA, hypertension and diabetic retinopathy were chart abstracted for yes answer in the questionnaire. Glaucoma was confirmed from the chart, and blood pressure for hypertension was measured.

4.10. Data quality assurance

Data quality was ensured by selecting the appropriate study design, carefully choosing study participants, and preparing a comprehensive data collection checklist and tool.

The pilot test conducted on 5% of the sample size (21 participants) at the ground army level two in Addis Ababa, Ethiopia was used as a step in ensuring the accuracy and consistency of the data collection process. Supervisory daily checks were helpful in detecting and fixing any inconsistencies or issues in the responses. This ongoing monitoring not only was enhancing the data quality that was being gathered but was also an opportunity for real-time feedback and adjusting the data collection process if necessary. Furthermore, this approach was helping to train the data collectors to build better knowledge about the questionnaire and make sure that all questions were being answered properly and in the same way. After the pre-test, these adjustments to data collection tools as may be necessary could be done based on what is gained, thereby enhancing the general study design.

4.11. Data processing and analysis

After data collection, the responses were coded to facilitate analysis. This involves the assignment of numerical values against categorical responses and identification of errors or discrepancies in entries in the data. The data was checked to verify it was complete and accurate. Missing or outlier values were addressed using strategies like removal of missing values or imputation for missing values and detection, removal of outliers, or individual analysis. The cleaned data was entered into Epi Data version 4.6. The software offers double entry to reduce errors in entry. Once data entry was completed and verified, it was exported to SPSS version 28 for further analysis. Descriptive analyses were used to give summaries of demographic characteristics and to estimate prevalence rates of visual impairment.

For analysis of the connections between categorical variables and visual impairment, Chi-square tests were employed. This was helping in establishing whether there are significant connections between these variables and the desired outcome. For estimation of significant predictors of visual impairment after adjusting for potential confounders, bivariate and multivariate logistic regression analysis was conducted. It allows estimation of odds of visual impairment in relation to various predictors and allows the researcher to adjust confounding variables and to estimate the effect of every predictor. Less than 0.05 was utilized as the cut-off for statistical significance; any result with a p-value less than this will be considered

statistically significant. Interpretation of the results, with reference to prior literature. The results were expressed in terms of tables and graphs, with percentages and key points of data in relation to the conclusions drawn.

4.12. Ethical considerations

A formal letter of ethical clearance and approval was obtained from the Institutional Review Board of Addis Ababa University (IRB-AAU), specifically from the School of Nursing and Midwifery's Department of Nursing Research Committee. Once ethical approval was secured, supportive letters were issued by the School of Nursing and Midwifery to the selected hospitals. Participants were informed about the study's objectives, and written permission was obtained from the hospital administrations prior to the initiation of data collection.

Informed consent was secured from each participant immediately before data collection began. During the informed consent process, participants received a clear overview of the research and its objectives. They were informed that they could participate of their own free will and had the right to withdraw from data collection at any moment.

To ensure the privacy of the participants' data, no personal identifiers were included in the data collection tool, thereby keeping their information confidential throughout the study.

4.13. Dissemination and Utilization of Results

The results of the study were presented and submitted in both soft and hard copy formats to the College of Health Sciences, School of Nursing and Midwifery at Addis Ababa University. Additionally, the research findings were shared with the hospitals involved in the study. Furthermore, the results will be published in international journals, making them accessible to anyone interested in utilizing the information.

5. RESULT

5.1.Demographical characteristics of the participant

In this study, there were 213 participants and 100% response rate. They were divided into seven age groups, of which 45 (21.2%) belonged to the age group of 40–44 years. The age of the participants varied from 40 to 92 years, with the mean age being 56 years and the median age being 53 years. Of the participants, 136 (63%) were male, and 166 (77.9%) were married. Additionally, 61 participants (28.6%) had been working in or were working in the military for 10 to 20 years. In terms of education, 72 participants (33.8%) had attained higher education. In terms of occupation, 99 participants (46.5%) were retired. Finally, the majority of participants, 193 (90.6%), resided in urban areas. (Table 2)

Table 2. Demographical characteristics of the participant individuals aged 40 years and above in selected military hospitals in Addis Ababa, Ethiopia, 2025 (n=213)

Variables	Category	Frequency	Percentage
Age	40-44	45	21.1
	45-49	32	15.0
	50-54	31	14.6
	55-59	23	10.8
	60-64	23	10.8
	65-69	22	10.3
	70 and above	37	17.4
Sex	Male	136	63.8
	Female	77	36.2
Marital status	Single	20	9.4
	Married	166	77.9
	Divorced	13	6.1
	Widowed	14	6.6
Service in years	0-10 years	42	19.7
	11-20	61	28.6
	21-30	57	26.8
	Above 30	41	19.2
	Civil	12	5.6
Educational level write	Unable to read and	14	6.6
	Able to read and write	19	8.9
	Primary school	55	25.8
	Secondary school	53	24.9
	Higher education	72	33.8
Occupation	Active military	79	37.1
	Retired	99	46.5
	Civil worker	20	9.4
	Family of active military	15	7.0
Residence	Urban	193	90.6
	Rural	20	9.4

5.2.Health history characteristics of the participants

In this study, the health history of the participants related to eye health revealed that 72 participants (33.8%) had cataracts. Additionally, other chronic health conditions not directly related to eye health included hypertension, reported by 62 participants (29.1%), and diabetes mellitus, reported by 55 participants (25.8%). In the eye examinations using the Snellen chart, 103 participants (48.4%) were found to have normal vision (6/6). Additionally, 100 participants (46.9%) reported having their eyes examined in the current year. (Table 3)

Table 3. Health history characteristics of the participants among individuals aged 40 years and above in selected military hospitals in Addis Ababa, Ethiopia (n = 213)

Variables	Category	Frequency	Percentage
Cataract	Yes	72	33.8
	No	141	66.2
Glaucoma	Yes	58	27.8
	No	155	72.2
Refractive error	Yes	41	19.2
	No	172	80.8
Diabetic retinopathy	Yes	27	12.7
	No	186	87.3
AMD	Yes	00	00
	No	213	100
Trachoma	Yes	00	00
	No	213	100
Injury	Yes	05	2.3
	No	208	97.7
Diabetes mellitus	Yes	55	25.8
	No	158	74.2
Hypertension	Yes	62	29.1
	No	151	70.9
Others	Yes	02	0.9
	No	211	99.1
Level of VI	Normal	103	48.4
	Mild	30	14.1
	Moderate	49	23
	Sever	25	11.7
	Blind	06	2.8
Last eye examination	Current year	100	46.9
	b/n 1-2 years	39	18.3
	before 2 years	41	19.2
	never	33	15.5
Difficulty watching TV	Yes	96	45..1
	No	117	54.9
Difficulty recognize faces	Yes	37	17.4
	No	176	82.6
Difficulty performing D/activities	Yes	34	16
	No	179	84
Currently taking medication for eye	Yes	82	38.5
	No	131	61.5
How difficulty reading print paper	No difficulty	53	24.9
	A little difficulty	92	43.2
	Some difficulty	51	33.9
	A lot of difficulty	13	6.1
	Cannot read at all	04	1.9
How difficulty recognize friends across the street	No difficulty	110	51.6
	A little difficulty	60	29.2
	Some difficulty	32	15
	A lot of difficulty	08	3.8
	Cannot recognise at all	03	1.4

5.3.Attitude and lifestyle characteristics of the participants

In this study, 65 (30.5%) were identified as cigarette smokers, with 23 (35.4%) of them having smoked for greater than 20 years. Additionally, 93 participants (43.7%) reported excessive alcohol consumption, while 68 (73.1%) consumed alcohol occasionally. A total of 59 (27.7%) participants engaged in physical exercise daily. Furthermore, 95 participants (44.6%) expressed concern about their eye health, and 188 participants (88.3%) recognized the importance of regular eye examinations. (Table 4)

Table 4. Attitude and lifestyle characteristics of the participants among individuals aged 40 years and above in selected military hospitals in Addis Ababa, Ethiopia, 2025. (n = 213)

Variables	Category	Frequency	Percentage
Cigarette smoking	Yes	65	30.5
	No	148	69.5
If yes for how long	Less than 10 years	20	9.4
	10 – 20 years	22	10.3
	More than 20 years	23	10.8
Do you consume alcohol	Yes	93	43.7
	No	120	56.3
If yes How often	Occasionally	18	8.5
	Sometimes	67	31.5
	Daily	08	3.8
Physical exercise?	Daily	59	27.7
	Weekly	34	16
	Monthly	17	08
	Rarely	47	22.1
	Never	56	26.3
Concerned about Visual health?	Very concerned	74	34.7
	Some concerned	95	44.6
	Not concerned	44	20.7
Regular eye examinations?	Yes	188	88.3
	No	25	11.7

5.4.Socio-Environmental Characteristics of the Participants

In this study, 83 participants (39%) reported a home-based primary work environment. Additionally, 60 participants (28.2%) spent 1 to 3 hours in front of screens. A total of 104 participants (48.8%) used protective eyewear while on duty. Furthermore, 122 participants (57.3%) had access to regular eye care services, and 144 participants (67.6%) indicated that transportation was not a barrier to accessing eye care services, 167 participants (78.4%) reported living with their families, and 171 participants (80.3%) indicated that they interact with their families on a daily basis. Additionally, 167 participants (78.4%) expressed feeling that they have a strong support network. Furthermore, 122 participants (57.3%) participated in social issues over the past year. A total of 173 participants (81.2%) stated that there is someone available to help them with daily activities if needed. Finally, 136 participants (63.8%) reported having no difficulty in social situations due to visual problems. (Table 5)

Table 5. Socio-Environmental characteristics of the participants among individuals aged 40 years and above in selected military hospitals in Addis Ababa, Ethiopia 2025. (n = 213)

Variables	Category	Frequency	Percentage,%
Primary work environment	Office	75	35.2
	Field/outdoor	38	17.8
	Home based	83	39.0
	Driver	3	1.4
	Other	14	6.6
Spend in front of screens?	Less than 1hr	65	30.5
	1-3 hr	60	28.2
	4-6 hr	24	11.3
	More than 6hr	19	8.9
	None	45	21.1
Protective eyewear while on duty?	Yes	104	48.8
	No	109	51.2
Access regular eye service	Yes	122	57.3
	No	91	42.7
transportation a barrier for eye care	Yes	69	32.4
	No	144	67.6
Living arrangement	Alone	25	11.7
	With family	167	78.4
	With friends	6	2.8
	In facility	15	7.0
Interact with friends or family?	Daily	171	80.3
	Monthly	16	7.5
	Yearly	11	5.2
	Rarely	14	6.6
	Never	01	0.5
Have a strong support network?	Yes	167	78.4
	No	46	21.6
Social participation last year	Yes	122	57.3
	No	91	42.7
have someone who can help you with daily activities	Yes	173	81.2
	No	40	18.8
Has difficulty in social situations	No difficulty	136	63.8
	Little difficulty	42	19.7
	Some difficulty	21	9.9
	A lot difficulty	11	5.2
	Cannot do at all	03	1.4

5.5.Prevalence of visual impairment

The Armed Forces Comprehensive and Specialized Hospital and the federal police hospital found in Addis Ababa and have 1048 and 812 patients respectively on follow-up for visual impairment. The study was conducted from January to February 20, 2025 and the total participants are 213 patients. From each hospital 119, 94 participants from AFCSH and FPH respectively. After the overall analysis the study revealed that the prevalence of visual impairment aged 40 years and above was 51.6%. By hospitals AFCSH is 56% and FPH also 45.7%. (Figure 3)

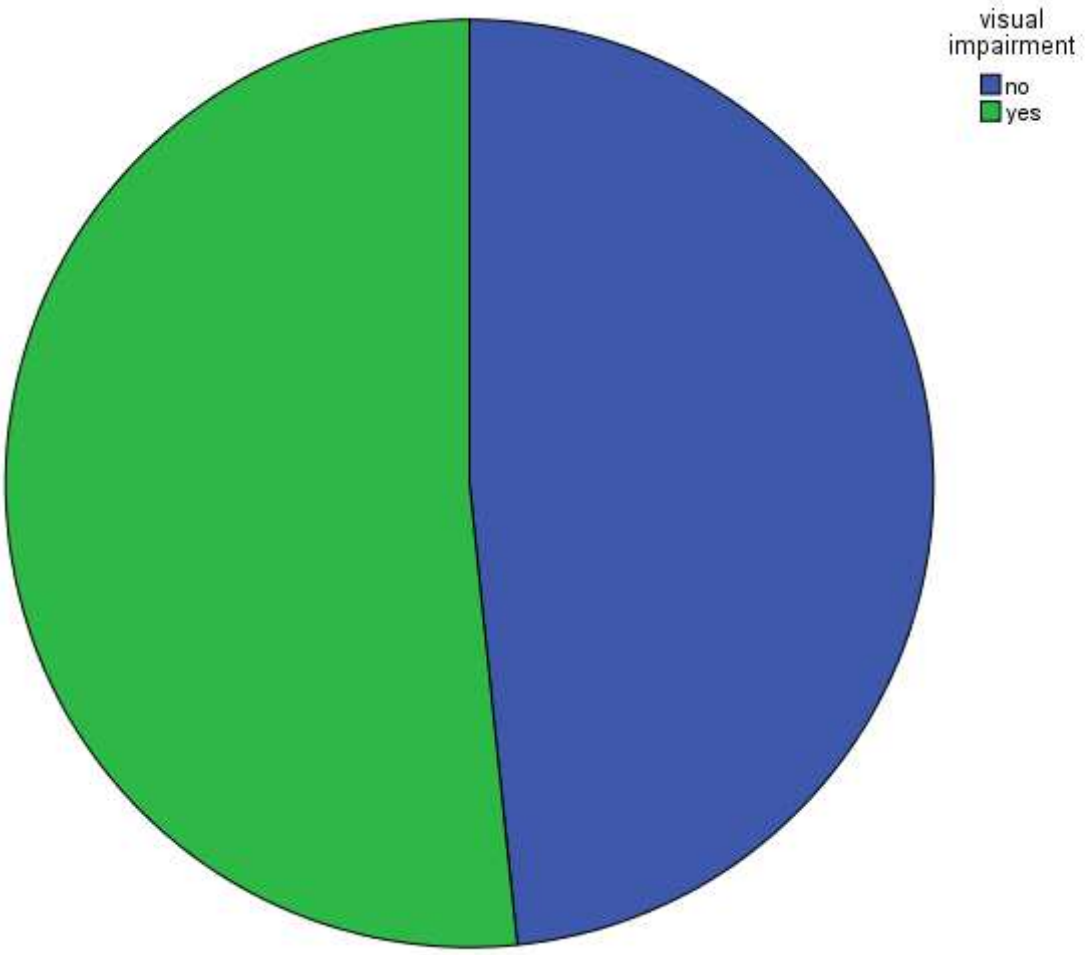


Fig.3. Prevalence of visual impairment among individuals aged 40 years and above in selected military hospitals in Addis Ababa.(n = 213)

5.6.Factors associated with visual impairment

5.6.1. Demographic factors

The prevalence of visual impairment is high among individuals over 69 years, with a prevalence of 14.6%. On the occupational front, the prevalence is 31.5% among retired individuals. Further, the prevalence of visual impairment among married individuals is 42.7%. (Table 6)

Table 6. Distribution of Visual Impairment Related to Demographic Factors among Individuals Aged 40 years and Above in Selected Military Hospitals in Addis Ababa. (n = 213)

		Visual impairment					
		Yes		No		Total	
Variables	Category	N	%	N	%	N	%
Age	40-44	07	3.3	38	17.8	45	21.1
	45-49	13	6.1	19	8.9	32	15.0
	50-54	10	4.7	21	9.9	31	14.6
	55-59	12	5.6	11	5.2	23	10.8
	60-64	17	8.0	06	2.8	23	10.8
	65-69	20	9.4	02	0.9	22	10.3
	70 & above	31	14.6	06	2.8	37	17.4
	Total	110	51.6	103	48.4	213	100
Sex	Male	70	32.8	166	31.0	136	63.8
	Female	40	18.8	37	17.0	77	36.2
	Total	110	58.7	103	41.3	213	100
Marital status	Single	04	1.9	16	7.5	20	9.4
	Married	91	42.7	75	35.3	166	78.0
	Divorced	06	2.8	07	3.3	13	6.1
	Widowed	09	4.2	05	2.3	14	6.5
	Total	110	51.6	103	48.4	213	100
Service in years	0-10	19	8.9	23	10.8	42	19.7
	11-20	24	11.3	37	17.4	61	28.6
	21-30	33	15.5	24	11.3	57	26.8
	Above 30	28	13.1	13	6.1	41	19.2
	Civil	06	2.8	06	2.8	12	5.6
	Total	110	51.6	103	48.4	213	100
Level of education	Unable to read & write	09	4.2	05	2.4	14	6.6
	Able to read &write	09	4.2	10	4.7	19	8.9
	Primary school	30	14.1	25	11.7	55	25.8
	Secondary school	30	14.1	23	10.8	53	24.9
	Higher education	32	15.0	40	18.8	72	33.8
	Total	110	51.6	103	48.4	213	100
Occupation	Active military	24	11.3	65	25.8	89	37.1
	Retired	67	31.5	32	15.1	99	46.5
	Civil	09	4.2	11	5.2	20	9.4
	Family of active military	10	4.7	05	2.3	15	7.0
	Total	110	51.6	103	48.4	213	100
Residence	Urban	97	45.5	96	45.1	193	90.6
	Rural	13	6.1	07	3.3	20	9.4
	Total	110	51.6	103	48.4	213	100

5.6.2. Health history factors

In the study presented here, the percentage of visually impaired individuals with cataracts has been revealed to be 24.9%. Additionally, among those with comorbid on is diabetic mellitus, the prevalence is 20.2%. The moderate level of visual impairment is the most common, affecting 25.8% of the visually impaired participant. Furthermore, 27.0% of visually impaired individuals have had their eyes examined within the past year. A significant portion, 35.7%, experiences difficulty watching TV, and 24.4% of those with visual impairment are currently taking medication related to their eye condition. (Table 7)

Table 7. Distribution of Visual Impairment Related to health history Factors among Individuals Aged 40 years and above in Selected Military Hospitals in Addis Ababa. (n = 213)

Variables	Category	Visual impairment				Total	
		Yes		No			
		N	%	N	%	N	%
Cataract	Yes	53	24.9	19	8.9	72	33.8
	No	57	26.8	84	39.4	141	66.2
	Total	110	51.6	103	48.4	213	100
Glaucoma	Yes	40	18.8	18	8.5	58	27.3
	No	70	32.9	85	39.9	155	72.7
	Total	110	51.6	103	41.3	213	100
Refractive error	Yes	25	11.7	16	7.6	41	19.3
	No	85	39.9	87	40.8	172	80.7
	Total	110	51.6	103	48.3	213	100
D-retinopathy	Yes	21	9.8	06	2.8	27	12.6
	No	89	41.8	97	45.5	186	87.3
	Total	110	51.6	103	48.4	213	100
AMD	Yes	00	00	110	51.6	110	51.6
	No	00	00	103	48.4	103	48.4
		00	00	213	100	213	100
Trachoma	Yes	00	00	110	51.6	110	51.6
	No	00	00	103	48.4	103	48.4
	Total	00	00	213	100	213	100
Trauma	Yes	04	1.9	00	00	04	1.9
	No	106	49.7	103	48.4	209	98.1
	Total	110	51.6	103	48.4	213	100
DM	Yes	43	20.2	12	5.6	55	25.8
	No	67	31.4	91	42.8	158	74.2
	Total	110	51.6	103	41.3	213	100
HTN	Yes	41	19.2	21	9.9	62	29.1
	No	69	32.4	82	38.5	151	70.9
	Total	110	51.6	103	48.4	213	100
Other chronic Disease	Yes	00	00	02	0.9	02	0.9
	No	110	51.6	101	47.5	211	99.1
		110	51.6	103	48.4	213	100
Level of VI	Normal	00	00	103	48.4	103	48.4
	Mild	30	14.1	00	00	30	14.1
	Moderate	49	23.0	00	00	49	23.0
	Sever	25	11.7	00	00	25	11.7
	Blind	06	2.8	00	00	06	2.8
	Total	110	51.6	103	48.4	213	100
Last eye examination	Current year	58	27.2	42	19.7	100	46.9
	b/n 1-2 years	20	9.4	19	8.9	39	18.3
	before 2 years	20	9.4	21	9.9	41	19.2
	never	12	5.6	21	9.9	33	15.5
	Total	110	51.6	103	48.4	213	100
Difficulty watching TV	Yes	76	35.7	20	9.4	96	45.1
	No	34	15.9	83	39	117	54.9
	Total	110	51.6	103	48.4	213	100

	Continue Table 7						
Difficulty recognizes faces	Yes	33	15.5	04	1.9	37	17.4
	No	77	36.2	99	46.5	176	82.6
	Total	110	51.6	103	48.4	213	100
Performing daily tasks	Yes	29	13.6	05	2.3	34	16
	No	81	38.0	98	46.1	179	84
	Total	110	51.6	103	48.4	213	100
Current taking medication	Yes	52	24.4	30	14.1	82	38.5
	No	58	27.2	73	34.3	131	61.5
	Total	110	51.6	103	48.4	213	100
Difficulty reading print?	No difficulty	07	3.3	46	21.6	53	24.9
	A little difficulty	46	21.6	46	21.6	92	43.2
	Some difficulty	41	19.2	10	4.7	51	23.9
	A lot of difficulty	12	5.6	01	0.5	13	6.1
	Cannot read at all	04	1.9	00	0.0	04	1.9
	Total	110	51.6	103	48.4	213	100
Difficulty recognizing a friend across the street?	No difficulty	32	15.0	78	36.6	110	51.6
	A little difficulty	39	18.3	21	9.9	60	28.2
	Some difficulty	29	13.6	03	1.4	32	15.0
	A lot of difficulty	07	3.3	01	0.5	08	3.8
	Cannot do at all	03	1.4	00	00	03	1.4
	Total	110	51.6	103	48.4	213	100

5.6.3. Lifestyle and attitudinal factors

Of these visually impaired subjects, 46.3% are cigarette smokers, 31% of whom have been smoking cigarettes for more than 20 years. In addition to this, 45.5% of the visually impaired subjects consume alcohol, 41% of whom use alcohol at sometimes. Furthermore, 33% of the visually impaired participants do not engage in any physical exercise. On a positive note, 46.2% express significant concern about their eye health, and an impressive 89.1% recognize the importance of regular eye examinations. Lastly, 67% of the visually impaired participants rate their eyesight as poor. (Table 8)

Table 8. Distribution of Visual Impairment Related to Lifestyle and Attitudinal Factors among Individuals Aged 40 years and above in Selected Military Hospitals in Addis Ababa. (n = 213)

		Visual impairment				Total	
		Yes		No			
Variables	Category	N	%	N	%	N	%
Cigarette smoking	Yes	51	23.9	14	6.6	65	30.5
	No	59	27.7	89	41.8	148	79.5
	Total	110	51.6	103	48.4	213	100
If yes for how long	Less than 10 years	13	19.7	06	10.6	20	30.3
	10 to 20 years	17	25.8	05	7.6	22	33.3
	More than 20 years	21	31.8	03	4.5	24	36.4
	Total	51	77.3	14	27.7	65	100
Drinking alcohol	Yes	50	23.5	43	20.2	93	48.4
	No	60	28.2	60	28.2	120	51.6
	Total	110	51.6	103	48.4	213	100
If yes how often	Occasionally	08	8.5	10	10.6	18	19.1
	Sometimes	37	41.5	30	30.9	67	72.4
	Daily	04	4.3	04	4.3	08	8.5
	Total	49	54.3	44	45.8	93	100
Engage ph-excersice	Daily	26	12.2	33	15.5	59	27.7
	Weekly	12	5.6	22	10.3	34	16
	Monthly	08	3.8	09	4.2	17	8.0
	Rarely	27	12.7	20	9.4	47	22.1
	Never	37	17.4	19	8.9	56	26.3
	Total	110	51.6	103	48.4	213	100
Concerning eye health	Very concerned	53	24.9	21	9.9	74	34.7
	Some concerned	45	21.1	50	23.5	95	44.6
	Not concerned at all	12	5.6	32	15.0	44	20.7
	Total	110	51.6	103	48.4	213	100
Aware on R-eye examination	Yes	98	46.0	90	42.3	188	88.3
	No	12	5.6	13	6.1	25	11.7
	Total	110	51.6	103	48.4	213	100
Rate your overall vision quality?	Poor	69	32.4	12	5.6	81	38.0
	Fair	39	18.3	44	20.7	83	39.0
	Good	02	0.9	34	16.0	36	16.9
	Excellent	00	00	13	6.1	13	6.1
	Total	110	51.6	103	48.4	213	100

5.6.4. Socio-environmental factors

In the present study, it was found that 29.1% of the visually impaired respondents were working in a main working environment at home, and 20.2% were on duty for less than one hour a day using a screen. In addition, 27.7% of the respondents had protective eyesight gear on duty, and 28.2% even had eye care service within a regular time frame. Additionally, 41.8% lived with their families, and 40.8% said yes regarding having an excellent support system. Interestingly, 24.9% didn't have any social issues due to their visual impairment. (Table 9)

Table 9. Distribution of Visual Impairment Related to socio-environmental Factors among Individuals Aged 40 years and above in Selected Military Hospitals in Addis Ababa. (n = 213)

Variables	Category	Visual impairment				Total	
		Yes		No			
Primary work environment	Office	26	12.2	49	23	75	35.2
	Field/outdoor	17	8.0	21	9.9	38	17.8
	Home based	62	29.1	21	9.9	83	39.0
	Driver	00	00	03	1.4	03	1.4
	Others	05	2.3	09	4.2	14	6.6
	Total	110	51.6	103	48.4	213	100
Spent in front of screen	Less than a hr	43	20.2	22	10.3	65	30.5
	1 – 3 hrs	29	13.6	31	14.6	60	28.2
	4 –6 hrs	11	5.2	13	6.1	24	11.3
	More than 6 hrs	02	0.9	17	8.0	19	8.9
	Never	25	11.7	20	9.4	45	21.1
	Total	110	51.6	103	48.4	213	100
Protective eyewear	Yes	59	27.7	45	21.1	104	48.8
	No	51	23.9	58	27.2	109	51.2
	Total	125	51.6	103	41.3	213	100
Have access to regular eye care	Yes	60	28.2	62	29.2	122	57.3
	No	50	23.5	41	19.2	91	42.7
	Total	110	51.6	103	48.4	213	100
Transport a barrier for eye service	Yes	40	18.8	29	13.6	69	32.4
	No	70	32.9	74	24.7	144	67.6
	Total	110	51.6	103	48.4	213	100
Current living arrangement	Alone	10	4.7	15	7.0	25	11.7
	With family	89	41.8	78	36.6	167	78.4
	With friends	03	1.4	03	1.4	06	2.8
	In facility	08	3.8	07	3.3	15	7.0
	Total	110	51.6	103	48.4	213	100
Interact with family or friends	Daily	90	42.3	81	38	171	80.3
	Monthly	08	3.8	08	3.8	16	7.5
	Yearly	07	3.3	04	1.9	11	5.2
	Rarely	05	2.3	09	4.2	14	6.6
	Never	00	00	01	0.5	01	0.5
	Total	110	58.7	103	48.4	213	100
Have a strong support network?	Yes	86	40.4	81	38	167	78.4
	No	24	11.2	22	10.3	46	21.6
	Total	110	51.6	103	48.4	213	100
Have participated social activities past year?	Yes	61	28.6	61	28.6	122	57.3
	No	49	23	42	23.0	91	42.7
	Total	110	51.6	103	51.6	213	100
have someone can help with daily activities	Yes	86	40.4	87	40.8	173	81.2
	No	24	7.5	16	7.7	40	18.8
	Total	110	51.6	103	48.4	213	100
difficulty have in social situations due to vision?	No difficulty	53	24.9	83	39	136	63.8
	A little difficulty	26	12.2	16	7.5	42	19.7
	Some difficulty	19	8.9	02	0.9	21	9.9
	A lot of difficulty	09	4.2	02	0.9	11	5.2
	Cannot do at all	03	1.4	00	00	03	1.4
	Total	110	51.6	103	48.4	213	100

5.6.5. Symptoms and impact of visually impaired participant among individuals aged 40 and above in selected military hospitals in Addis Ababa, Ethiopia.

Total 110 (51.6%) patients had visual impairment in this study. Among them, 97 (88.2%) had both eye impairment. In addition, 101 (91.8%) patients had difficulty in reading. From 110 visually impaired participants, drivers were 69 (62.7%) among them, 26 (23.6%) stated that they have little difficulty driving at night. (Table 10)

Table 10. Distribution of VI Related to symptoms and impact of VI mong Individuals Aged 40 years and Above in Selected Military Hospitals in Addis Ababa.: (n = 213)

		Visual impairment				Total	
		Yes		No			
Variables	Category	N	%	N	%	N	%
Which is affected	Unilateral	13	11.8	00	00	13	11.8
	Bilateral	97	88.2	00	00	97	88.2
	Total	110	100	00	00	110	100
Blurred vision	Yes	95	86.4	00	00	95	86.4
	No	15	13.6	00	00	15	13.6
	Total	110	100	00	00	110	100
Difficulty to see at night	Yes	61	55.4	00	00	61	55.4
	No	46	44.5	00	00	46	44.5
	Total	110	100	00	00	110	100
Double vision	Yes	31	28.2	00	00	31	28.2
	No	79	71.8	00	00	79	71.8
	Total	110	100	00	00	110	100
Difficulty in reading	Yes	101	91.8	00	00	101	91.8
	No	09	8.2	00	00	09	8.2
	Total	110	100	00	00	110	100
Focusing in close objects	Yes	38	34.5	00	00	38	34.5
	No	72	65.5	00	00	72	65.5
	Total	110	100	00	00	110	100
Has VI affected your daily activities	Yes	74	67.3	00	00	74	67.3
	No	36	32.7	00	00	36	32.7
	Total	110	100	00	00	110	100
Difficulty driving at night	No difficulty	09	8.2	00	00	09	8.2
	Little difficulty	26	23.6	00	00	26	23.6
	Some difficulty	15	13.6	00	00	15	13.6
	A lot of difficulty	09	8.2	00	00	09	8.2
	Cannot drive at all at night	10	9.1	00	00	10	9.1
	Total	69	62.7	00	00	69	62.7
Difficulty distinguish colors	No difficulty	51	46.4	00	00	51	46.4
	Little difficulty	31	28.2	00	00	31	28.2
	Some difficulty	14	12.6	00	00	14	12.6
	A lot of difficulty	08	7.3	00	00	08	7.3
	Cannot distinguish at all	06	5.5	00	00	06	5.5
	Total	110	100	00	00	110	100

5.7.Bivariate and Multivariate analysis for the occurrence of V-impairment

In this study on regression analysis, a bivariate analysis was used to examine on the following variables: age, sex, years of service, level of education, occupation, cataracts, glaucoma, refractive errors, diabetes mellitus (DM), hypertension, difficulties in watching television, recognizing faces, and reading printed materials. Additionally, considered factors such as cigarette smoking, excessive alcohol consumption, physical exercise, concerns about eye health, regular eye examinations, use of protective eyewear, and difficulties participating in social situations due to visual impairment (VI) significantly predict the occurrences of visual impairment.

Subsequently, a multivariate analysis was conducted, which revealed that the following variables remained statistically significant in relation to the occurrence of visual impairment: age, cataract, glaucoma, refractive errors, DM, difficulty in watching on TV screen, and cigarette smoking. Each of these variables demonstrated a P-value of less than 0.05, indicating a significant association with visual impairment. (Table 11)

Table 11. Bivariate and Multivariate analysis for the occurrence of V-impairment among aged 40 years and above in selected military hospitals. (n = 213)

Variables	Category	Visual impairment		COR(95% CI)	AOR(95% CI)	P value
		Yes (%)	No (%)			
Age		110(51.6)	103(48.4)	1 1.118(1.082-1.155)	1 1.073(1.035-1.113	.000*
Cataract	Yes No	53(24.9) 57(36.8)	19(8.5) 84(39.4)	4.11(2.205-7.663) 1	5.806(2.414-13.969) 1	.000*
Glaucoma	Yes No	40(18.8) 70(32.9)	18(0.9) 85(39.9)	2.698(1.423-5.117) 1	2.386(1.008-5.647) 1	.048*
R.error	Yes No	25(11.7) 85(39.9)	16(7.5) 87(40.8)	1.599(.798-3.205) 1	4.009(1.345-11.953) 1	.013*
DM	Yes No	43(20.2) 67(31.5)	12(5.6) 91(42.7)	4.867(2.385-9.933) 1	3.682(1.376-9.856) 1	.009*
Difficulty watching TV	Yes No	76(35.7) 34(16.0)	20(9.4) 83(39.0)	9.276(4.921-17.49) 1	3.616(1.616-8.091) 1	.002*
Performing D.tasks	Yes No	29(14.1) 81(44.6)	05(1.9) 98(39.4)	7017(2.598-18.95) 1	3.713(.856-16.106 1	.080
Cigarette smoking	Yes No	51(19.7) 59(39,0)	14(3.3) 89(38.0)	5.495(2.793-10.812) 1	4.167(1.661-10.455) 1	.002*

Note: constants are represented by the value 1, while an asterisk (*) denotes a statistically significant association.

6. DISCUSSION

In this study, data were collected from the eye unit departments of two hospitals, AFCSH and FPH, involving a total of 213 participants. An institutional-based cross-sectional stud design was employed for the research. The overall prevalence observed in the study was 51.6%.

The prevalence of visual impairment in this research (51.6%) was considerably higher than that reported in various studies from various parts of the world. A population-based cross-sectional longitudinal study in India, for instance, reported a prevalence of 12.6% (18) and a community-based cross-sectional study in Sri Lanka reported a prevalence of 21.3% (15). Similarly, a cross-sectional study in China indicated a prevalence of 12.45%. (6) In the USA, a population-based descriptive cross-sectional study revealed a prevalence of 2.82%.(36) Other studies in Ethiopia showed varying prevalence rates: Debre Birhan (16.8%), Addis Ababa 22.6%(28), Gondar 15.3% (17), and Northwest Ethiopia was 40.8% (21), while a community-based cross-sectional study in Southern Ethiopia reported a prevalence of 36.95%.(22).

The higher prevalence observed in this study may be because of differences in study populations and periods. Military staff might possess special demographic and health profiles compared to the general population. The age, gender distribution, and physical fitness could contribute significantly toward the prevalence of particular eye conditions. Further, military personnel are more likely to have more frequent eye exams and greater access to specialty care, enabling vision-related issues that would otherwise remain undetected in civilian populations to be detected earlier. Further still, psychological stress attributable to military service, as well as lifestyle considerations such as diabetes mellitus, and cigarette smoking, also have an effect on visual health.

In contrast, the prevalence in South Africa, a retrospective chart reviews study, which found an overall prevalence of 61.5%(27) . which is higher than this study, The lower prevalence in this study related this study due to study design and age of participant.

The findings of this study highlight the prevalence of bilateral visual impairment among participants and name the major symptoms of the condition, which are a problem with reading and blurred vision. Moreover, how visual impairment influences daily life is also striking with a vast majority complaining of a problem in their everyday lives. All this information can be utilized by healthcare professionals and policymakers in developing certain interventions and support initiatives for individuals with visual impairment.

The analysis reveals several critical associations between various factors and the likelihood of visual impairment among older adults. Notably, with each additional year of age, the probability of experiencing visual impairment increases by approximately 7.3%. This statistically significant relationship underscores the importance of implementing targeted interventions and routine screenings for visual health in older populations.

Cataracts emerge as a significant contributor to visual impairment, with individuals diagnosed with this condition exhibiting over five point eight times higher odds of experiencing visual impairment (Adjusted Odds Ratio [AOR] = 5.806). The robust statistical significance of this association, supported by a confidence interval that reinforces the finding, highlights the necessity for regular cataract screenings among older adults.

Glaucoma being a significant factor associated with visual impairment. Specifically, individuals with glaucoma have more than double the odds of experiencing visual impairment compared to those without glaucoma, and this finding is statistically significant ($p = 0.048$). This suggests that interventions aimed at managing or preventing glaucoma could be important in reducing the prevalence of visual impairment in this age group.

Refractive error is identified as a significant factor associated with this impairment, with individuals affected by refractive error having approximately four times higher odds of experiencing visual impairment (AOR= 4.009) compared to those without such errors. The results are statistically significant ($p = 0.013$), underscoring the need for targeted interventions to address refractive errors in this population to help reduce the burden of visual impairment.

Diabetes mellitus also plays a crucial role, with individuals affected by this condition showing about 3.68 times higher odds of experiencing visual impairment (AOR = 3.682). The statistical significance of this association, confirmed by a confidence interval that excludes 1 and a p-value of 0.009, emphasizes the importance of effective diabetes management to reduce the risk of visual impairment in older adults.

Furthermore, daily activities such as watching television can serve as indicators of visual health. Those who report difficulty in this area have approximately 3.62 times higher odds of experiencing visual impairment (AOR = 3.616). The strong statistical significance of this finding suggests that addressing visual difficulties in everyday tasks can enhance the quality of life for older adults and guide interventions aimed at reducing visual impairment.

Finally, cigarette smoking is identified as a modifiable risk factor, and smokers have about 4.17 increased chances of having visual impairment (AOR = 4.167). The consistency of this association highlights the importance of public health programs in smoking cessation to improve visual health among older populations.

7. STRENGTH AND LIMITATION

7.1.Strength

This study is simple to design and execute, it requires less time and resources compared to longitudinal studies, and this study is the first in military hospital. It is a great instrument for formulating hypotheses for later studies by way of the identification of variables whose relationship must be explored in greater detail. The studies also allow for the simultaneous measurement of a number of variables in a population, and they give a comprehensive overview of the health status or behaviors of the population. Further, they are more cost-effective, as they do not have follow-up for extended periods.

7.2.Limitation

The primary limitation of this study is that they cannot define cause-and-effect relationships. Only snap shots of associations among variables at one point in time obtained by this study, and which couldn`t be possible to determine the order of exposure and outcome over time. Due to this reason, it was challenges to interpret results. The study was provide valuable information regarding the prevalence of a certain behavior or condition, but they are superficial in explaining why such patterns exist, and also the diagnosis of VI depends on only on visual acuity, it excluded visual field examination.

8. CONCLUSION AND RECOMMENDATION

8.1. Conclusion

The prevalence of visual impairment among individuals 40 years and above in certain military hospitals was 51.6%, depicting an enormously high rate within this group. Age, cataracts, glaucoma, refractive errors (RE), diabetes mellitus (DM), not being able to watch television, and cigarette smoking were established by the study to be significant determinants of visual impairment. These findings reflect the need for interventions and comprehensive eye care among such populations.

8.2. Recommendation

For Healthcare Professionals: Established standard vision screening practices should be implemented to enhance the eye status of the elderly for the prompt identification of eye diseases like cataracts and glaucoma. Comprehensive eye care should also be included in diabetes care plans because frequent eye check-ups can prevent vision-related complications among diabetic patients. Ultimately, offering robust support and aid for the cessation of smoking, including counselling and coverage of quit programs, will reduce the risk of tobacco-induced visual impairment.

For 'Policymakers': Set up and fund public health programs that advocate for the importance of eye health, with a focus on reaching the elderly and vulnerable populations. Offer expanded funding for community-based eye care services providing low-cost screening and treatment to the elderly.

For Studied Institutions: For the purposes of achieving eye health needs for older adult populations in the institution, regular evaluation should be conducted to design the services appropriately. Through incorporation of eye care education and screenings into current health programs among elderly adults, we are significantly enhancing overall health outcomes. We should also identify and remove transportation and accessibility barriers so that elderly adults may acquire timely eye care services with ease.

For Researchers: Conduct longitudinal studies to track follow-up trends in eye health among the aging population over time, and establish risk factors and effective interventions, Apply qualitative techniques with quantitative information to gain a better understanding of the visually impaired older person's experience and barriers

9. REFERENCES

1. Bourne RR, Flaxman SR, Braithwaite T, Cicinelli MV, Das A, Jonas JB, et al. Magnitude, temporal trends, and projections of the global prevalence of blindness and distance and near vision impairment: a systematic review and meta-analysis. The Lancet Global Health. 2017;5(9):e888-e97.
2. Zou M, Guo D, Chen A, Young CA, Li Y, Zheng D, et al. Prevalence of visual impairment among older Chinese population: A systematic review and meta-analysis. Journal of global health. 2021;11:08004.
3. Karovski M, Gazepov S. PSYCHOLOGY OF LOW VISION. KNOWLEDGE-International Journal. 2024;63(4):473-7.
4. Moyegbone J, Nwose E, Oketta O, Oronsaye E, Onyeije B, Osunu P, et al. Visual Impairment Management and Associated Socio-demographic Factors among School Children in Delta State, Nigeria Received date: 14 July 2024 Revised date: 21 August 2024 Accept date: 25 August 2024.
5. Ye H, Zeng Y, Xiao H, Yu J, Liu Y, Zhang S, et al. Prevalence and factors associated with visual impairment in middle-aged and older Chinese population. Frontiers in Medicine. 2022;9:962729.
6. Ogedengbe TO. Content development for a tool to assess the preparedness of employment environment to welcome people with visual impairment. 2023.
7. Steinmetz JD, Bourne RR, Briant PS, Flaxman SR, Taylor HR, Jonas JB, et al. Causes of blindness and vision impairment in 2020 and trends over 30 years, and prevalence of avoidable blindness in relation to VISION 2020: the Right to Sight: an analysis for the Global Burden of Disease Study. The Lancet Global Health. 2021;9(2):e144-e60.
8. Flaxman SR, Bourne RR, Resnikoff S, Ackland P, Braithwaite T, Cicinelli MV, et al. Global causes of blindness and distance vision impairment 1990–2020: a systematic review and meta-analysis. The Lancet Global Health. 2017;5(12):e1221-e34.
9. Study VLEGotGBoD. Global estimates on the number of people blind or visually impaired by cataract: a meta-analysis from 2000 to 2020. Eye. 2024;38(11):2156.
10. Okesanya OJ, Olatunji G, Olaleke NO, Mercy MO, Ilesanmi AO, Kayode HH, et al. Advancing immunization in Africa: overcoming challenges to achieve the 2030 global immunization targets. Adolescent Health, Medicine and Therapeutics. 2024:83-91.
11. Markos M, Kefyalew B, Tesfaye HB. Pooled prevalence of blindness in Ethiopia: a systematic review and meta-analysis. BMJ Open Ophthalmology. 2022;7(1).

12. Alliance A. International Eye Organizations: A Select List. Global Health and Volunteering Beyond Borders: A Guide for Healthcare Professionals. 2019:271.
13. Woo D, Comeau ME, Venema SU, Anderson CD, Flaherty M, Testai F, et al. Risk factors associated with mortality and neurologic disability after intracerebral hemorrhage in a racially and ethnically diverse cohort. JAMA network open. 2022;5(3):e221103-e.
14. Hapugoda H. Prevlence of visual impairment among adults aged forty years and above in the MOH area Mahara 2009.
15. Abeysena C, Bandara H. Prevalence of visual impairment among adults aged forty years and above in a medical officer of health area in Sri Lanka: cross-sectional study. 2018.
16. Gupta N, Vashist P, Malhotra S, Senjam SS, Misra V, Bhardwaj A. Rapid assessment of visual impairment in urban population of Delhi, India. PLoS One. 2015;10(4):e0124206.
17. Wiafe B, Universal OE. Ghana blindness and visual impairment study. Accra: International Agency for the Prevention of Blindness. 2015.
18. Tagoh S, Kyei S, Kwarteng MA, Aboagye E. Prevalence of refractive error and visual impairment among rural dwellers in Mashonaland Central Province, Zimbabwe. Journal of Current Ophthalmology. 2020;32(4):402-7.
19. Tegegn MT, Assaye AK, Belete GT. Prevalence, causes and associated factors of visual impairment and blindness among older population in outreach site, Northwest Ethiopia. A dual center cross-sectional study. African Health Sciences. 2023;23(3):683-95.
20. Woretaw H, Shiferaw D. Prevalence and associated factors of visual impairment and blindness at university of gondar teaching hospital, gondar, northwest ethiopia. IntJPharm Hcare. 2015;3(02):48-54.
21. Assefa NL, Admas AW, Adimasu NF. Prevalence and associated factors of visual impairment among adults at Debre Berhan town, North Shewa, Ethiopia. BMC ophthalmology. 2020;20:1-8.
22. Deme TG, Mengistu M, Getahun F. Prevalence and associated factors of visual impairment among adults aged 40 and above in Southern Ethiopia, 2022. Scientific Reports. 2024;14(1):2542.
23. Killeen OJ, De Lott LB, Zhou Y, Hu M, Rein D, Reed N, et al. Population prevalence of vision impairment in US adults 71 years and older: the National Health and Aging Trends Study. JAMA ophthalmology. 2023;141(2):197-204.
24. Al-Namaeh M. Common causes of visual impairment in the elderly. Medical Hypothesis, Discovery and Innovation in Ophthalmology. 2022;10(4):191.

25. Seidu A-A, Agbadi P, Duodu PA, Dey NEY, Duah HO, Ahinkorah BO. Prevalence and sociodemographic factors associated with vision difficulties in Ghana, Gambia, and Togo: a multi-country analysis of recent multiple Indicator cluster surveys. BMC Public Health. 2021;21:1-17.

26. Srivastava S, Kumar M, Muhammad T, Debnath P. Prevalence and predictors of vision impairment among older adults in India: evidence from LASI, 2017–18. BMC ophthalmology. 2023;23(1):251.

27. Leshabane MM, Rampersad N, Mashige KP. Prevalence, causes and factors associated with vision impairment in Limpopo province. African Vision and Eye Health. 2024;83(1):1-9.

28. Cherinet FM, Tekalign SY, Anbesse DH, Bizuneh ZY. Prevalence and associated factors of low vision and blindness among patients attending St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia. BMC ophthalmology. 2018;18:1-6.

29. Furtado JM, Reis TF, Eckert KA, Lansingh VC. 2020 and now: what has been accomplished in blindness prevention and what is next? : SciELO Brasil; 2020. p. 5-9.

30. Citaristi I. United nations human settlements programme—UN-habitat. The Europa Directory of International Organizations 2022: Routledge; 2022. p. 240-3.

31. Dalton MK, Remick KN, Mathias M, Trinh Q-D, Cooper Z, Elster EA, et al. Analysis of surgical volume in military medical treatment facilities and clinical combat readiness of US military surgeons. JAMA surgery. 2022;157(1):43-50.

32. Evans DD, Hoyt KS. Ophthalmologic emergencies: Assessment and management. Advanced Emergency Nursing Journal. 2023;45(4):E9-E38.

33. Kumar Jr MJ, Kotak PS, Acharya S, Nelakuditi M, Parepalli A. A Comprehensive Review of Ocular Manifestations in Systemic Diseases. Cureus. 2024;16(7).

34. Varma R, Vajaranant TS, Burkemper B, Wu S, Torres M, Hsu C, Choudhury F, McKean-Cowdin R. Visual Impairment and Blindness in Adults in the United States: Demographic and Geographic Variations From 2015 to 2050. JAMA Ophthalmol. 2016 Jul 1;134(7):802-9. doi: 10.1001/jamaophthalmol.2016.1284. PMID: 27197072; PMCID: PMC5116104.

9. APPENDIX

9.1. APPENDIX I : STUDY PARTICIPANT INFORMATION SHEET

My name is _____. I am working as the data collector of the study being conducted in this Hospital. I kindly request you to lend me your attention to explain you about the study in general

Objective of the study: to assess the Prevalence and Associated Factors of visual impairment Among aged 40 years and Above new cases and on Follow Up in selected military hospitals in Addis Ababa, Ethiopia, 2024.

Purpose of the research is expected to fill gap of information about the prevalence of VI and possible factors responsible for VI patients who are new cases and on follow up in selected military hospitals in Addis Ababa city. The data collectors will collect the necessary information from study subjects and from using interviewer administered structured questionnaire, which takes approximately 20 minutes.

Risk and /or Discomfort: Participating in this study does not have any risk or harm,

Benefits: Participating in this study does not have any direct benefit and incentives. But the findings from this research may reveal important information for regional health planners.

Rights of participants

Participation in this study is fully voluntary. You have the right to decide whether to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time. You do not have to answer any question that you do not want to answer.

Confidentiality:

The information you will give us will be confidential. There will be no information that will identify you in particular. Any information forwarded will be kept secret and your name will not be specified.

Person to contact: **Contact address: Principal investigator**:
Email:melesgizachew93@gmail.comMobile phone No: 251920142886

9.2. APPENDIX II: CONSENTFORM

Consent statement:

By signing below, you acknowledge that you have read and understood the information provided above, and you consent to participate in this study.

Participant's Name: _____

Participant's Signature:_____

Date:_____

9.3. APPENDIX III: ENGLISH VERSION QUESTIONNAIRE

Section 1: Demographic Information

Instruction: Select one option from the given alternative

SN	QUESTIONS	CHOICES	REMARKS
1	How old is your age?	1. 40-44 2. 45-49 3. 50-54 4. 55-59 5. 60-64 6. 65-69 7. 70 and above	
2	Gender	1. Male 2. Female	
3	Marital Status:	1. Single 2. Married 3. Divorced 4. Widowed	
4	How many years of service have you completed in your current position?	1. 0-10 2. 11-20 3. 21-30 4. 31 and above	
5	Educational Level:	1. No formal education and unable to write and reading 2. No formal education but who able to write and reading 3. Primary school 4. Secondary school 5. Higher education (college/university)	
6	Current Occupation	1. Active military 2. Retired 3. Civil worker 4. Families of military person	
7	Residence	1. Urban 2. Rural	

Section 2: Health History

Instruction: Select options from the given alternative

SN	QUESTIONS	CHOICES	REMARKS
8	Do you have any diagnosed eye conditions? (check all that apply)	1. Cataracts 2. Glaucoma 3. Diabetic retinopathy 4. Other (please specify): 5. None	
9	Do you have any chronic medical conditions? (Select all that apply)	1. Diabetes 2. Hypertension 3. Other (please specify): 4. None	
10	Snellen's result		
11	Level of visual impairment (based on Snellen test)	1. Normal 2. Mild 3. Moderate 4. Severe 5. Blind	
12	When was your last eye examination?	1. Less one year ago 2. 1-2 years ago 3. More than 2 years ago 4. Never	
13	Do you experience difficulty with any of the following activities due to your vision?	1. Reading 2. Watching TV 3. Driving 4. Recognizing faces 5. Performing daily tasks (e.g., cooking, cleaning)	
14	Are you currently taking any medications for eye-related issues?	1. Yes 2. No	
15	How much difficulty do you have reading print?	1. No difficulty 2. A little difficulty 3. Some difficulty 4. A lot of difficulty 5. Cannot read at all	
16	How much difficulty do you have recognizing a friend across the street?	1. No difficulty 2. A little difficulty 3. Some difficulty 4. A lot of difficulty 5. Cannot do at all	

Section 3: Lifestyle and Attitudes and Awareness

Instruction: Select one option from the given alternative

SN	QUESTIONS	CHOICES	REMARK
17	Do you smoke cigarette?	1. Yes 2. No	
18	If yes for cigarette smoking, for how long time?	1. Less than 10 years 2. 10 – 20 years 3. More than 20 years	
19	Do you consume alcohol?	1. Yes 2. No	
20	If yes to Qn no 19 How often do you consume alcohol?	3. Daily 4. Occasionally 5. Frequently	
21	How often do you engage in physical exercise?	1. Daily 2. Weekly 3. Monthly 4. Rarely 5. Never	
22	How concerned are you about your vision health?	1. Very concerned 2. Somewhat concerned 3. Not concerned at all	
23	Are you aware of the importance of regular eye examinations?	1. Yes 2. No	

Section 4: Environmental Factors

Instruction: Select one option from the given alternative

SN	QUESTIONS	CHOICES	REMARK
24	What is your primary work environment?	1. Office 2. Field/Outdoor 3. Home-based 4. Other(please specify):	
25	How many hours per day do you spend in front of screens? (e.g., computer, phone, TV)	1. Less than 1 hour 2. 1-3 hours 3. 4-6 hours 4. More than 6 hours 5. None	
26	Do you use protective eyewear while on duty?	1. Yes 2. No	
27	Do you have access to regular eye care services?	1. Yes 2. No	
28	Is transportation to eye care services a barrier for you?	1. Yes 2. No	

Section 5: Social Factors

Instruction: Select one option from the given alternative

SN	QUESTIONS	CHOICES	REMARK
29	What is your current living arrangement?	1. Alone 2. With family 3. With friends 4. In a facility	
30	How often do you interact with friends or family?	1. Daily 2. Weekly 3. Monthly 4. Rarely	
31	Do you feel you have a strong support network?	1. Yes 2. No	
32	Have you participated in any social activities or community programs in the past year?	1. Yes (please specify): 2. No	
33	Do you have someone who can help you with daily activities if needed?	1. Yes 2. No	
34	How much difficulty do you have in social situations due to your vision?	1. No difficulty 2. A little difficulty 3. Some difficulty 4. A lot of difficulty 5. Cannot do at all	

Section 6: Vision Symptoms and Impact

Instruction: Select options from the given alternative

SN	QUESTIONS	CHOICES	REMARK
35	Do you have any difficulty seeing?	1. Yes 2. No	If no skip to Qn-43
36	If yes Qn number 35, please describe		
37	Have you experienced any of the following symptoms? (check all that apply)	1. Blurred vision 2. Difficulty seeing at night 3. Double vision 4. Difficulty focusing on close objects 5. Difficulty reading 6. Other (please specify):	
38	Has your vision impairment affected your daily activities or work performance?	1. Yes (please explain): 2. No	
39	How does your vision affect your daily activities? (Check all that apply)	1. Difficulty reading/writing 2. Difficulty driving 3. Difficulty recognizing people 4. Difficulty watching television 5. Other (please specify)	
41	How much difficulty do you have driving at night? (If he is a driver)	1. No difficulty 2. A little difficulty 3. Some difficulty 4. A lot of difficulty 5. Cannot drive at all	
42	How much difficulty do you have distinguishing colors?	1. No difficulty 2. A little difficulty 3. Some difficulty 4. A lot of difficulty 5. Cannot distinguish colors at all	
43	How would you rate your overall vision quality?	1. Poor 2. Fair 3. Good 4. Excellent	

Section 7: Additional Comments

44. Please provide any additional comments or concerns regarding your vision: