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DEPARTMENT OF OPTOMETRY

ASSESSING THE IMPACT OF PRESBYOPIA ON QUALITY OF LIFE OF PATIENTS AGED 40-65 YEARS AT BINDURA PROVINCIAL HOSPITAL.

BY

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DECLARATION

I, Tafadzwa Kore, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the University of Zimbabwe

_____ Date: _____

Tafadzwa Kore

APPROVAL FORM

We hereby certify that we have read this thesis prepared under our direction by Tafadzwa Kore, titled,*"**ASSESSING THE IMPACT OF PRESBYOPIA ON QUALITY OF LIFE OF PATIENTS AGED 40-65 YEARS AT BINDURA PROVINCIAL HOSPITAL"*** and recommend that it be accepted as fulfilling the dissertation requirements for the degree of BSc Honours in Optometry HBsc Opt OPTC 405

_____ Date: _____

DR C N MTUWA

DEDICATION

I would like to dedicate this dissertation to my family

ABSTRACT

Presbyopia, an age-related diminished ability to see objects close by, is a large, part of the problem of uncorrected refractive error in many low- and middle-income countries including Zimbabwe. There are over a billion people currently affected throughout the world and prevalence is highly variable by region and age-structure. For instance, in some Latin American populations, rates as high as 90 percent have been observed among adults over the age of 35 years. The effects of uncorrected presbyopia are well documented: individuals who are affected have a significant decrease in the quality-of-life indicators, have problem with the activities of daily living in the near vision domain and, in a surprising proportion, need help with everyday activities. These restrictions are not only of visual discomfort, but also of general work capacity and social participation, especially in places where it is difficult to get corrective spectacles or in places where these cannot be paid for.In Zimbabwe, this is apparent in Bindura Provincial Hospital which is serving both rural and urban communities where other urgent needs may take precedence over visual health issues. It is important to understand then, how presbyopia affects every day functioning in this group of people. The present study is a cross-sectional design study to assess the quality of life effect in patient's age 40-65 years combining clinical & patient reported outcomes. The study expects to discover a high prevalence of presbyopia in this age group, and a lower performance in near vision functions in subjects without adequate near correction, and a lower quality-of-life score in the subjects where access to the spectacles is difficult due to economical or logistical reasons.

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LIST OF ABBREVIATIONS

QoL (Quality of Life)

LMIC’s (Low and Medium -Income Countries)

URE’s (Uncorrected Refractive Errors)

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CHAPTER 1: BACKGROUND AND JUSTIFICATION

1.1 Introduction

The chapter one introduces the research about the effect of presbyopia on quality of life of patients 40-65 years in Bindura Provincial Hospital. It helps to give the context and justification for this research. It also details the issue which led to the field research being conducted by the researchers and the significance of this research in optometry.

Presbyopia is an age-related decrease in the ability of the eye to accommodate, or focus on near objects. It usually strikes at the age of 40 and more than 1 billion people worldwide have been affected by it, with more than half of adults over 30 years of age suffering from symptoms (Fricke et al., 2018). If not corrected, presbyopia can make it harder to read, sew, cook and use a mobile phone, which can lead to reduced productivity and quality of life. Presbyopia is a well-known condition since ancient times and has caused some social issues, which have led to speculations on its mechanistic causes already by Plutarchus, 100 AD (Barbero 2013). The most important risk factor for presbyopia is age; however, disease, trauma and medication (Fasih et al., 2014) can also play a role. Presbyopia has traditionally been believed to be due to lens hardening, although other causes have been suggested such as changes in the elasticity of the tissues and the ciliary body (Weale 1962; Glasser et al., 2006). Current treatments are corrective in nature, performed by optical (bifocals, trifocals, contact lenses) or surgical (accommodative intraocular lenses, laser, and conventional corrective surgical techniques). At present, there is no pharmaceutical treatment or remedy to reverse the natural ageing of the lens. For a condition that affects every adult and has the potential to have significant impact on one's lifestyle, little is known about the quality of life or financial impact of presbyopia on society. This study aims to find out how much the condition of Presbyopia affects the QOL of patients aged between 40 to 65 years at Bindura provincial hospital.

Bindura Provincial Hospital is situated in Mashonaland Central Province catering for both urban and rural dwellers. The study contributes significantly to the understanding

of presbyopia's impact in Zimbabwe, as the country's optometric services are underdeveloped, with only a few clinics in the entire country. The burden is compounded in low and middle-income countries (LMICs) by a lack of access to affordable corrective spectacles. For instance, a study in rural Tanzania found a prevalence of 62% for presbyopia among adults aged 40 years or older, and 94% in adults aged 70 years or older (Mashayo et al., 2014). Fifty-six point eight percent (56.8%) of the rural population in Zimbabwe is visually impaired with uncorrected refractive errors (UREs) accounting for 54.2% of all cases. (Mashige et al., 2016). According to Linfield et al., 78.6% of people in rural Zimbabwe suffer from near vision impairment caused by presbyopia (Lindfield et al. 2012). Nevertheless, the coverage of spectacle remains low with less than 10% of presbyopes in LMICs receiving adequate correction compared to more than 90% in high-income countries (Ma et al., 2022).

Most quantitative quality of life studies in presbyopia have been directed towards deciding on the efficacy of presbyopia correction, mainly surgical methods. Few data exist on the consequences of uncorrected presbyopia on quality of life. Qualitative and limited quantitative studies have shown that presbyopia has a tremendous effect on the quality of life of individuals in various aspects such as activity limitation, inconvenience, emotional, social and economic factors (Kandel et al., 2017). Presbyopia has been associated with the increased difficulty in performing near tasks. (Patel et al. 2006). Patients with presbyopia have difficulty doing tasks at close distances. But, in pre-presbyopic patient, there will be no problems in doing near work for a longer duration but may experience visual discomfort due to poor sustained accommodation or reduced amplitude of accommodation. (Reindel et al., 2018). As a result, people over the age of 35 may experience asthenopia symptoms when doing near work or using digital devices for extended periods of time (Reindel et al., 2018). Digital eye strain is highly associated with presbyopia and its contributing factors, including accommodative and vergence problems and working distances (Coles-Brennan, Sulley, and Young 2019). One of the most prevalent indications for optical correction in presbyopes is professional needs (Wolfsohn et al., 2020). Many people express

difficulties and frustrations, especially when they don't have adequate visual correction (Naroo, Nagra and Retallic 2022). This may include issues such as not being able to see important documents, wearing someone else's glasses or difficulty adapting to new glasses (Berdahl et al., 2020), which can increase fatigue and absences from work (Schakel et al., 2018). There have also been reports of psychologically related issues, such as the perception of being unprofessional at work. (Stokes et al., 2022). The condition can result in negative emotional responses, including embarrassment, anger, shame, denial, discomfort, insecurity, low self-esteem and worry about the progression of presbyopia (Findley et al., 2023). An analysis of social media posts from individuals with presbyopia revealed that most posts regarding consequences of presbyopia were emotive (70%), with sadness to joy following a successful course of treatment (Wolffsohn et al., 2020).

Presbyopia is at least as much as an impact as distant vision impairment (Tahhan et al., 2013) in terms of number of life years that people would sacrifice to be disease-free, using the "Time Trade Off" technique. Presbyopia Impact and Coping Questionnaire (PICQ) and other patient-reported questionnaires are available for people with presbyopia to assess their coping strategies. Research carried out with this technique shows that patients generally use the same strategies. Fifteen compensatory coping behaviors were found to help with visibility, the most common of which were optical correction/squinting, and making basic adjustments (e.g., moving image or object farther away or changing image size or settings, etc.). Emotions most frequently reported with presbyopia were anger, frustration with forgetting glasses, and relying on others for support (Johnson et al., 2021). Research has shown that near vision correction with optical devices is related to a decrease in depressive symptoms (Horowitz et al., 2006). Many older adults are at risk of loneliness due to physical and functional decline and other losses associated with ageing, which may also have an impact on their interactions and engagement with others (Smith 2012). Correcting visual issues, including presbyopia, optimally may help with social interactions. Even without supporting data, there is an obvious global trend that individuals with presbyopia feel

that their quality of life is reduced as compared to those without presbyopia (Kandel et al.,2017). Uncorrected presbyopia can mean extra difficulties with everyday activities and a higher need for others to help and support them. Multifaceted source studies have yielded further findings regarding social issues with presbyopes, including trouble seeing faces, reading or concentrating, trouble seeing in smoking environments and reluctance to attend night time driving events (Findley et al., 2023).

1.2 Background of the Study

Presbyopia is an age-related vision problem and is characterized by the gradual decline in the eye's ability to focus up close. It is common to all people as they get older and typically occurs between the ages of 40 and 45. Presbyopia is an important public health issue due to the increase in life expectancy, particularly in low and middle-income countries where access to corrective lenses is limited (Fricke et al., 2018).

Visual impairments such as presbyopia may impair activities of daily living, reduce productivity and have a negative impact on the psychological and social lives of those who have the impairments in Zimbabwe. To effectively target interventions for promoting visual health and improve patient outcomes at Bindura Provincial Hospital, understanding the burden of presbyopia and its impact on patients' quality of life is crucial.

1.3 Problem Statement

Although presbyopia is a major contributors to loss of economic productivity and quality of life, it is often neglected in low and middle-income countries where other health issues take precedence. Service adoption barriers in Zimbabwe include the cost of services (for instance glasses are priced at USD 150-350 in a country where many people live in poverty), lack of knowledge, poor access to clinics and cultural misconceptions (for instance, people think that glasses are a sign of weakness). In a clinic based study in metropolitan Zimbabwe (Naidoo et al., 2010) it was found that 20-30% of those with refractive problems were repaired. Uncorrected presbyopia has an impact on not only near tasks but also more general aspects of life, such as employment

(farming or artisanal crafts), household tasks (dressing children, sewing or sorting out grains), and social interaction. This causes dependency, annoyance and loss of income, especially for women and rural dwellers who are overburdened in their care responsibilities (Fricke et al., 2018). Many patients at Bindura Provincial Hospital have problem associated to them which hinders their independence and overall quality of life, and it is difficult for them to read, sew or do close work. Paying attention to the impact of presbyopia on different aspects of patients' life is important because the size of this impact has not been sufficiently explored in this context.

1.4 Objectives

To assess the impact of presbyopia on quality of life among patients at Bindura Optometry Clinic.

AIMS

1. To determine the prevalence of presbyopia among patients aged 40-65 years.
2. To assess the impact of presbyopia on daily activities such as reading, working and social interactions of patients attended at Bindura Provincial Hospital.
3. To determine the relationship between demographic characteristics (age, gender, occupation) and quality of life outcomes among patients with presbyopia.
4. To identify barriers to obtaining and using presbyopic corrections.

1.5 Significance of the Study

Presbyopia is one of the most prevalent causes of vision impairment in the elderly, but is underdiagnosed in many underdeveloped countries, including Zimbabwe. The study has many important implications, both clinical, social, and policy aspects of visual health and patient well-being are addressed

Clinical

Understanding how presbyopia affects patients' quality of life would allow optometrists at Bindura Provincial Hospital to:

- Look for early signs of presbyopia during routine eye tests.
- Provide appropriate counselling and management techniques based on the patients' lifestyle and work requirements.
- Incorporate presbyopia screening into other eye care procedures to encourage a comprehensive assessment of visual health.

The hospital can use these approaches to improve presbyopia detection and management, reducing patient frustration and visual disability.

Public Health

Presbyopia can impair functional ability and productivity, especially in near-vision occupations such as reading, sewing, farming, or handicrafts. Poor eyesight caused by untreated presbyopia in rural and semi-urban areas may limit earnings and quality of life.

The results of this investigation will:

- Determine the prevalence of presbyopia as a public health concern at provincial level.
- Contribute to the design and implementation of community-based screening and vision correction initiatives.
- Emphasize the importance of improving visual function as a key component of healthy aging.
- Emphasize the importance of affordable and easily accessible reading glasses in public health facilities.

Academic and Research

From an academic standpoint, this study will add to the existing literature on presbyopia in low-income settings. The vast majority of current data on presbyopia and quality of

life are from high-income countries. This study will provide local data from Bindura Provincial Hospital:

- Close the knowledge gap in Zimbabwe about the prevalence of presbyopia and its socioeconomic impact.
- Establish a baseline for future research on cost-effective therapies and long-term outcomes.
- Assist in training, teaching and conducting research in optometry, ophthalmology and public health.
- Add to the limited literature on presbyopia in Zimbabwe.

Societal

Improved presbyopia awareness and management can have a significant impact on the well-being and independence of people over 40 in their communities. Access to low-cost correction improves not only vision, but also confidence, mental health, and social participation in those affected. As a result, the findings of this study will quality of life, economic productivity, and social inclusion in the Bindura community and beyond.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Presbyopia is the process of the eye's impaired ability to focus on near objects. Typically, it manifests in the late 30s and progresses until 65 years of age (Reilly et al., 2023). It's caused by a loss of lens elasticity within the eye. The power of accommodation or the ability of the eye to focus on near and far objects is determined by two forces: elasticity of the lens and the action of the ciliary muscle (Garner et al., 2016). If the ciliary muscle relaxes, the ring moves away from the lens; the suspensory ligaments stretch, flatten the lens and it is used for seeing objects at a distance. The power of accommodation is gradually reduced with age resulting in presbyopia (Strent et al., 2005).

2.2 What is quality of life?

Quality of life is a subjective term and varies from individual to individual. According to WHO “an individual’s perception of their position in life in the context of their culture and value system, in relation to their goals, expectations, standards and concerns” (Saxena et al., 2001). This definition encompasses physical, psychological, social, independence and environmental health. When it comes to research on the impact of presbyopia, “quality of life” is now linked to vision and eye health. For presbyopia, it involves assessing the impact of the patients' inability to see up close on their daily lives (Goetz et al., 2014). In this study conducted at Bindura Provincial Hospital ‘QoL' acquires a new significance. It is crucial to learn the impact of presbyopia on our patients' daily activities. It is about economic well-being (can a market vendor count clearly), as well as the grandmother’s ability to measure and administer medicine to her grandchildren. It also needs autonomy and safe navigation. It also enhances personal satisfaction. To sum up, a good quality of life for a Bindura Provincial Hospital patient is to be able to work and participate in the community without any limitations being simply unable to see clearly up close (Patel et al., 2006).

2.3 Global prevalence

In 2026, there will be 1.8 billion people who are presbyopic. This accounts for about 25% of the world population (Delanghe 2026). In the future this is likely to increase as a result of demographic trends, such as an ageing population. By 2030, it is expected that 2.1 billion people will have Presbyopia (Mao et al., 2030).

2.4.1 Prevalence by region

North America

Around 135 million people suffer from presbyopia. It also boasts the largest percentage for correction of presbyopia using glasses and contact lenses. Presbyopia is present in about 40-50% of the population of people aged over 40 years old.

Latin America

Presbyopia occurs in 45% to 55% of people. Moderate prevalence, with a better correction in urban areas than in rural areas, which are still behind (Chan et al., 2018).

Europe

40 to 50 percent prevalence. It is less common than in Africa. It can be accessed widely with optical correction to minimize impacts (Donaldson 2021).

Asia

Approximately 50-60% of the population are affected by presbyopia. It is abundant and makes a large contribution to the global population. There is a need for major correction in rural areas (Man et al., 2013).

Africa

It has the greatest burden as a large number of cases are not corrected due to lack of access to spectacle correction, which leads to decline in productivity (Naidoo et al.,2013).

Zimbabwe

Little data is available to understand the prevalence of presbyopia in Zimbabwe. But the major cause of near-sightedness in middle-aged and elderly individuals is uncorrected presbyopia (Kwarteng et al., 2023).

2.5 General prevalence

One of the biggest risk factors of presbyopia is age. The risk of developing presbyopia increases by 15% per year from the age of 40 to 50, but only 1% per year after 50. Hyperopic patients are four times more prone to develop presbyopia compared to emmetropic, and two percent more prone than myopes (Muhammad et al., 2022). Refractive errors seem to have an earlier onset of presbyopia than emmetropic subjects (Atchison 1998). Females typically start to use spectacles for near vision at an earlier age than males. Diabetes, cardiovascular disease and multiple sclerosis are some other factors which may play a part in the development of presbyopia. Some drugs (including antihistamines and antideppresants) can also accelerate progression (Charman et al., 2019).

2.6 Impact of Presbyopia

Economic impact

According to the Seva's Foundation, it is estimated that 1 trillion USD is lost from middle and lower economic countries due to vision loss, including a considerable contribution of uncorrected presbyopia (Bala et al, 2020). Global productivity losses that are caused by uncorrected presbyopia alone are estimated to be between 25 billion and 45 billion per year. These numbers exemplify lost output when workers are not able not to do near task competently or are forced to leave the work force prematurely (Chan et al, 2018).

Uncorrected presbyopia is a direct and immediate strain on the earning of most of the workers who rely heavily on near vision task. For farmers and food processors it becomes difficulty in doing farming activities such as seedling and even grading smaller grains(wheat). This leads to decreased productivity and output. For traders, the inability

to read accurately and count money and use mobile phone puts traders at a severe disadvantage and increase errors (Burns et al, 2014). For artisanal miners and manual labourer's such as tailors it becomes difficulty to thread a needle or a builder it becomes hard to take measurements. This results in increased mistakes on the job or even causes workers to leave skilled work prematurely.

Social Impact

Family and social relationship Impact

The Nigerian study reported that presbyopic individuals are more likely to report having problems with family due to poor vision as compared to non-presbyopic individuals. Females were almost four times more likely to suffer from family issues (TS et al,2016).

Women in Zimbabwean rural areas which primarily do lots of work which requires near task vision such as cooking, sewing and childcare are affected most. These people may develop problems with family relationships when they develop presbyopia. A study conducted in Zanzibar also found that interventions that specifically target women could have a substantial impact, while qualitative research indicated that better near vision leads to increased women's confidence and decision making (Yong et al 2025).

2.7 Psychological and Emotional Consequences

The psychological impacts of uncorrected presbyopia is clearly shown from the literature (Bentley et al,2021) discovered that female presbyopes are likely to report having" felt looked down upon compared to their male counterparts . Social stigmatisation (viewed old and incapable of doing tasks) can also lead to loss of self-esteem and can lead to social withdrawal as well. It has also been found that people with presbyopia were not satisfied with their overall health when compared with those without presbyopia, this indicates that the near vision loss can impact on the overall health perception beyond the specific visual task (Johnson et al,2021).

2.8 Case studies of similar studies carried out

The basic relationship between uncorrected presbyopia and reduced quality of life has been firmly established worldwide. A pivotal study was done by (Uche et al,2014) which showed that prevalence of presbyopia was 63.4%. And in their studies, they showed that prevalence increased with age. In conclusion they outlined that prevalence of presbyopia in rural Africa was high. According to (Munoz et al 2006) presbyopia was prevalent in the rural areas with 62% and it showed that it has a significant effect on setting in activities of daily living.

Likewise, a qualitative study was conducted in Nigeria (Bodunde et al,2020) which revealed that the presbyopes' near vision problems and need for assistance are the most prominent. They pointed out that the most challenging tasks included sorting grains, threading needle, cutting fingernails, writing and recognizing small objects. The conclusion of (Muhamad et al,2015) was that the effect of Presbyopia on the quality of life was enormous in rural areas.

Another study in Zanzibar (Laviers et al, 2010) found that lack of affordability to spectacle correct the presbyopia was also due to lack of access to quality eye care and lack of awareness. The study also revealed that large proportion of participants reported the prices for spectacles at the time of purchase as too expensive. A Chi square indicated that affordability, availability and accessing had a significant influence on refractive services uptake.

2.9 Gap Identification

While studies have been done in most sub-Saharan countries such as Kenya and Nigeria. The research has provided valuable details into presbyopic effects and barriers but no similar study has been done in Zimbabwe. In the city of Bindura, there is a different context of economics, social and cultural. Impacts that can be felt by teachers in Kenya and farmers in Nigeria may not be applicable at Bindura Provincial Hospital. No clinical data is available describing the impact of presbyopia on patients' quality of life. In Zimbabwe, refractive errors continue to be largely untreated in rural areas and are a widespread health issue. The most prevalent cause of vision impairment (56.8%)

was uncorrected refractive errors (URES) accounting for 54.2% of vision impairment in the community-based study in rural Zimbabwe (Kwarteng et al., 2023). Although this study added to the knowledge of the general burden of visual impairment, it failed to specifically determine the effects of presbyopia and hence there is a gap in literature regarding the effects of presbyopia in the Zimbabwean context.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter outlines the logic and justification behind how the researchers are going to plan to answer the research question or solve the problem. Chapter 3 describes how the effect of presbyopia on patients' QOL was evaluated at Bindura Provincial Hospital. The study design, study period, study population, research instruments and materials, validity and reliability of instruments, sampling method, sample size, inclusion criteria, exclusion criteria, data collection, questionnaire, clinical examination, and data analysis techniques are all covered in this section. The chapter also includes the ethical approval needed for the study to be ethically conducted.

3.2 Study Design and Rationale

Design: Cross-sectional mixed methods study (quantitative survey measures and brief qualitative interviews).

The cross sectional quantitative approach will enable the prevalence and degree of association between the severity of the presbyopia and QoL to be estimated at one point in time. This will create statistical relationships and enable comparisons between sub-groups. Qualitative interviews (complementary) provide insight into lived experience, coping mechanisms and patient priorities that cannot be easily quantified. It's perfect for discovering the lived experience, such as what it's like to live with the functional and emotional challenges of presbyopia every day.

3.3 Study period

The study was done for 2 months (April to May). This period of time was sufficient to recruit participants, collect data, examine clinically, and begin the process of cleaning the data.

3.4 Study population

All patients between 40-65 years who came for clinical examination with a diagnosis of Presbyopia were included in the study population.

Target population

- Adult population between 40 and 65 years of age to attend for examination in clinic

3.5 Study Setting

Bindura Provincial Hospital, Zimbabwe

3.6 Inclusion Criteria

- Patients aged 40-65 years

- Presbyopia is a diagnosis made during the current visit or in the patient's history or when patients present with a complaint of near vision problems that is consistent with presbyopia. Presbyopia is vision failure to read N8 at 40cm or an addition of +1.00ds or more to achieve N8 or better.

Includes all ethnic groups.

3.7 Exclusion Criteria

- Patients with an ocular co-morbidity which is a severe problem and is an independent cause of vision impairment (e.g., advanced cataract, advanced glaucoma and advanced macular degeneration) unless the co-morbidity is stable and the patient's primary complaint is presbyopia.

- Not able to give reliable answers due to cognitive impairment.

- Any acute ocular infection or condition which precludes near vision testing.

- Patients with uveitis, diabetes, pregnancy, history of trauma/medical conditions that have an impact on vision

3.8 Sampling Technique

The consecutive sampling technique was used. This sample is a non-probability sampling method where all the eligible patients who present at the study site (Bindura Provincial Hospital) within the data collection period and fulfilling the inclusion criteria will be invited to participate in the study until the desired sample size is achieved. Cost effective and time efficient. It reduces the need for a lot of community outreach, travel, or various recruitment locations to obtain a probability sample. The recruitment takes place at the same time as routine clinical services, which enables efficient data collection within the 2-month period.

3.9 Sample size

The minimum sample size needed for study was determined by the formula below.

n=N/(1+NE^2)

N= Approximate number of patients at Bindura Provincial Hospital.

= 395

e= margin of error

=0.05

n= 395/(1+395x.0.05^2)

=198.74

=198

3.10 Research Instruments and Materials

Data collection was done using the following instruments and materials:

- Structured questionnaire

A structured, interviewer administered questionnaire was created which included:

1. Socio-demographic data

Age, gender, level of education, occupation

Near Activity Visual Questionnaire (NAVQ)

Clinical Examination Equipment

- Snellen’s Visual Acuity Chart- Used to measure distance visual acuity (both unaided and aided).

Near Vision Chart- To check the Near Vision at 40 cm with standard light conditions.

- Autorefractor- Objective refraction is used for this.

- Trial Lens Set and Trial frame- Subjective refraction and determination of near add power.

- Slitlamp- Biomicroscopy – To rule out other causes of eye disease in the front of the eye.

Direct ophthalmoscope-to exclude retinal pathologies for fundal examination.

3.11 Data Collection

We used a structured approach in this study to collect both quantitative and qualitative data to evaluate the impact of presbyopia on patients' quality of life (QoL). We, as the main researchers, gathered the data from Bindura Provincial Hospital spanning two months (April–May 2026) within the hospital's working hours to avoid interference. Participants were recruited from 40 to 65 years old who came to the hospital for routine eye examinations using consecutive sampling technique. The ethical aspects were taken care of in the first place by obtaining approval from the Research Board Committee of Bindura University of Science Education and the hospital administration. We obtained

written informed consent from all participants, which outlined the purpose, voluntary nature, and confidentiality measures (e.g., data anonymisation by unique coding) of the study.

Data collection tools used are NAVQ. The NAVQ is a self-reported questionnaire validated to assess QoL across domains including near vision tasks, emotional well-being, social functioning and dependency. It is used to assess the ability of patients to perform near vision (such as reading or using electronic devices) with presbyopia. In addition, there was a brief demographic questionnaire to obtain data such as age, gender, occupation and education level. The NAVQ is composed of 11 items, ten task-oriented questions and one overall satisfaction question. Responses are graded using a four-point Likert scale (0-3, where 0 indicates no difficulty, 1 indicates a little difficulty, 2 indicates moderate difficulty and 3 indicates extreme difficulty). On overall satisfaction scaled (0-4, where 0 is completely satisfied, 1 is very satisfied, 2 is moderately satisfied, 3 is a little satisfied and 4 is completely satisfied). In response to the qualitative element, we have included Section 2 which covered the psychosocial impact from question 11 to 15. Answers are scored on a five-point Likert scale (1-5, 1 being definitely true, 2 being mostly true, 3 being mostly false, 4 being definitely false and 5 being not sure). Section 3 is graded 1-5, 1 being 'all of the time' and 5 being 'none of the time' and includes the functional limitations for question 16 and 17. This tool was selected because it has good reliability (Cronbach's alpha >0.80 in similar studies), is free software and can be adapted for presbyopia context.

We conducted interviewer-assisted administration of the questionnaire, which involved reading the questions aloud without providing prompts, for those with low literacy. All data was taken on paper forms and later entered into a secure excel spreadsheet on our password protected laptop to guard against data loss or unauthorized access.

3.12 Data Analysis

The data was gathered using the NAVQ and entered in MS. EXCEL and exported to SPSS. Data was then transformed using SPSS into codes and then frequency tables, graphs and charts were then created

3.13 Ethical consideration

The study will be submitted to Research Board Committee of Bindura University of Science Education as a project. The ethical clearance number is BUSEREC/0195/2026.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

This Chapter discusses the findings of data analysis based on the objectives of the study, literature review and the Near Acuity Visual Questionnaire. The data we will be represented in pie charts, tables and graphs. A total of 199 respondents were included in the study with a 99.5% response rate.

The socio-demographic profile of the sample is given below.

One hundred and ninety-nine participants (N =199) who presented to the Bindura Provincial Hospital in the data collection period and who met the inclusion criteria were included in the study sample. All the respondents were Black and could speak Shona language, English language or both.

The data has been collected and distributed to the students.

The mean age of the participants was 51.97 years, (SD =7.50 years). Range 40 to 65 years). The age distribution is a clinical sample where the majority of the population are at the peak of their career and at the age of supporting a family, and where uncorrected near-vision impairment can severely affect their lives, both at home and at work. According to gender analysis females (n=110) outnumbered males (n=89). 55.3 % as to 44.7%. This gender distribution is similar to the distribution of healthcare-seeking and clinical attendance in general ophthalmic studies in rural and peri-urban Zimbabwe (Tagoh et al.,2020)..

4.2 Demographic Characteristics

Gender Distribution

Figure 4.1 shows the gender breakdown of study participants. Females (n = 110) outnumbered males (n = 89) in the sample.

Table 1 Gender Distribution

Sex	Frequency	Percent
Male	89	44.7
Female	110	55.3
Total	199	100.0

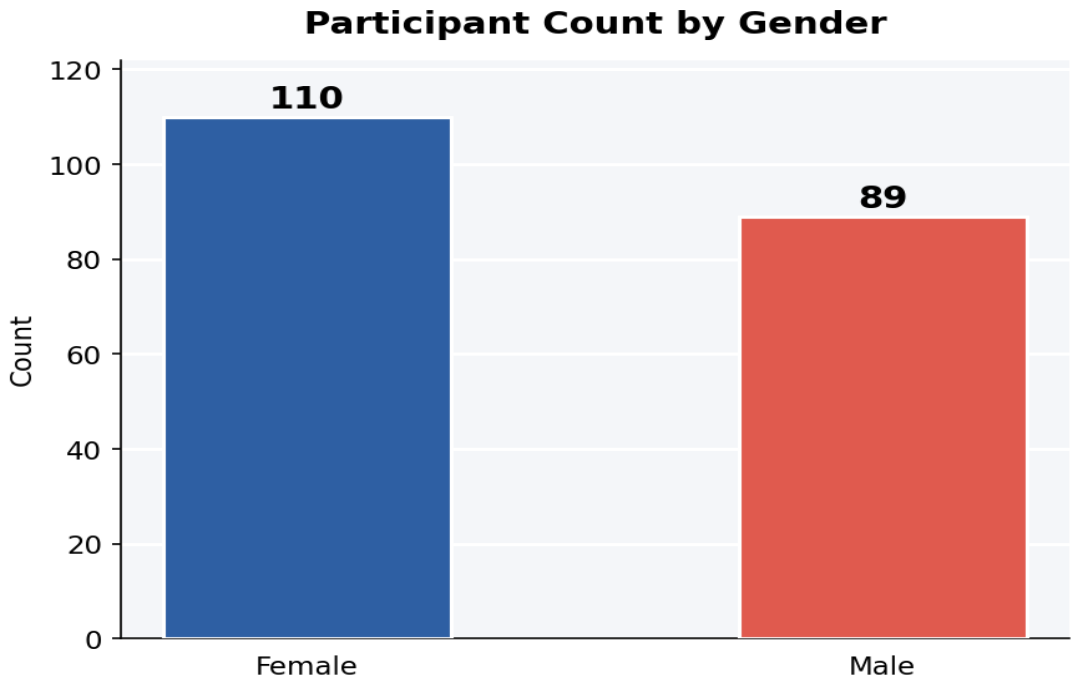

Figure 4.1: Participant count by gender

4.3 Age Distribution

Figure 4.2 displays the age distribution with a normal curve overlay. The sample ranged from 40 to 69 years (M = 51.97, SD = 7.50).

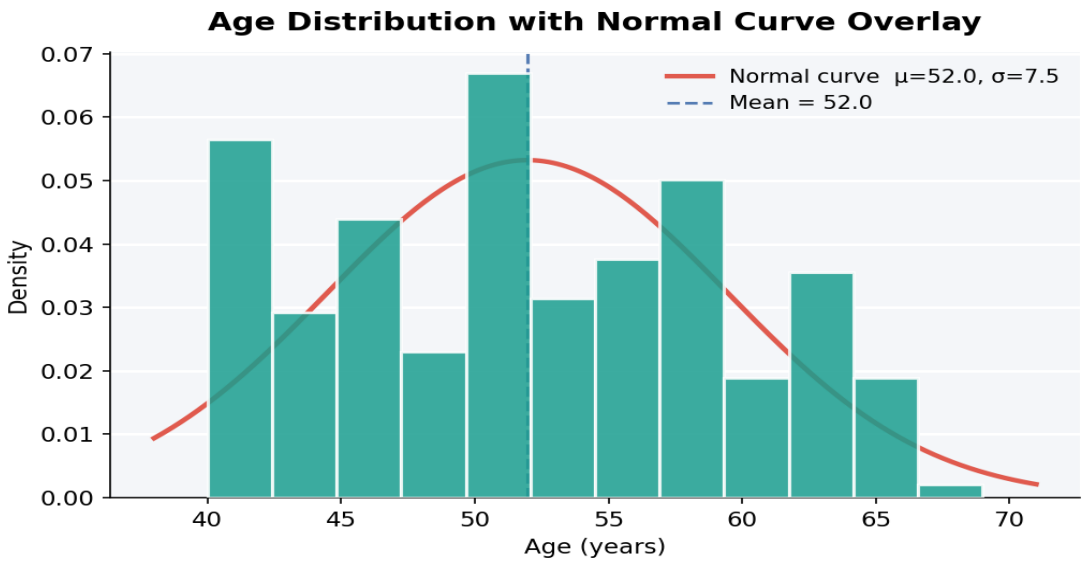

Figure 4.2. Age Distribution with Normal Curve Overlay

Educational Attainment and Occupational

Table 2 shows the highest level of education of the participants. The majority of participants attained Ordinary Level (n= 88) and Tertiary (n= 86) qualification. 23 participants had Primary Level and one participant reported Advanced Level.

Highest level of education	Frequency	Percent
Primary Level	23	11.6
O Level	88	44.4
A Level	1	0.5
Tertiary	86	43.4
Total	198	99.9

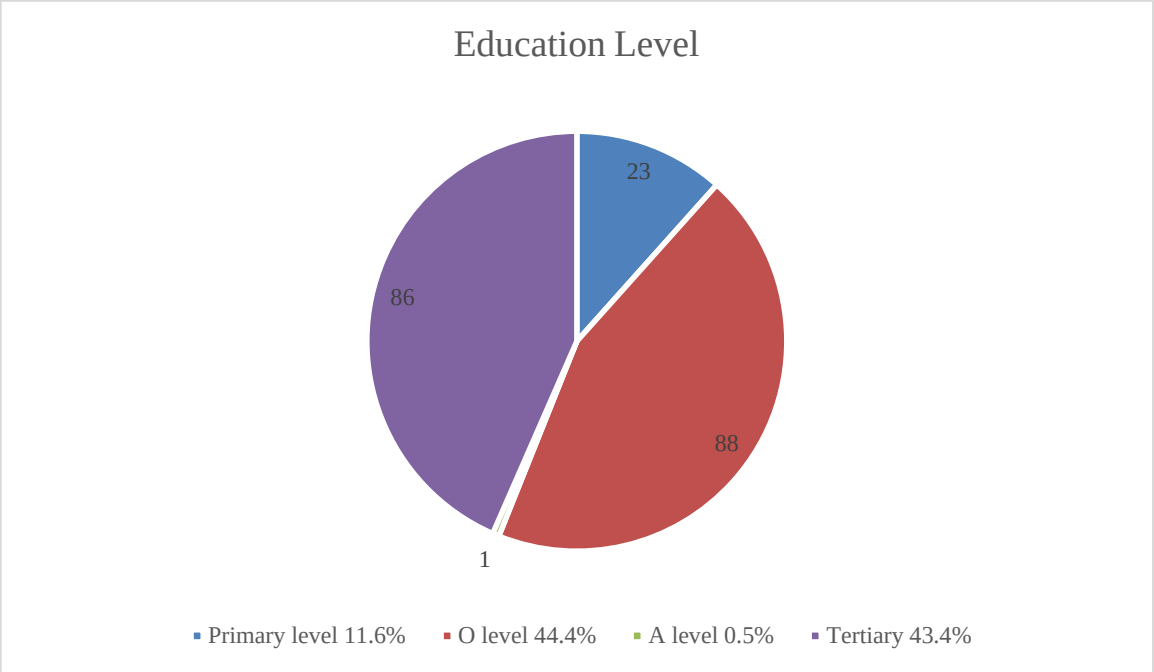

Fig 4.3 Pie chart showing highest level of education of participants

The occupations of the participants are indicated in figure 4.3. The mean grand total scores for each occupational group with two or more subjects shown is provided below. Presbyopia has a greater overall visual impact on certain occupations, for example, clerical workers, tailors and technicians which require prolonged or detailed near work. The mean scores for these occupations were higher. In contrast, less near vision demanding occupations (e.g. drivers, general laborers) had lower mean scores. This trend suggests that the perceived burden of presbyopia is influenced by the occupational visual demands.

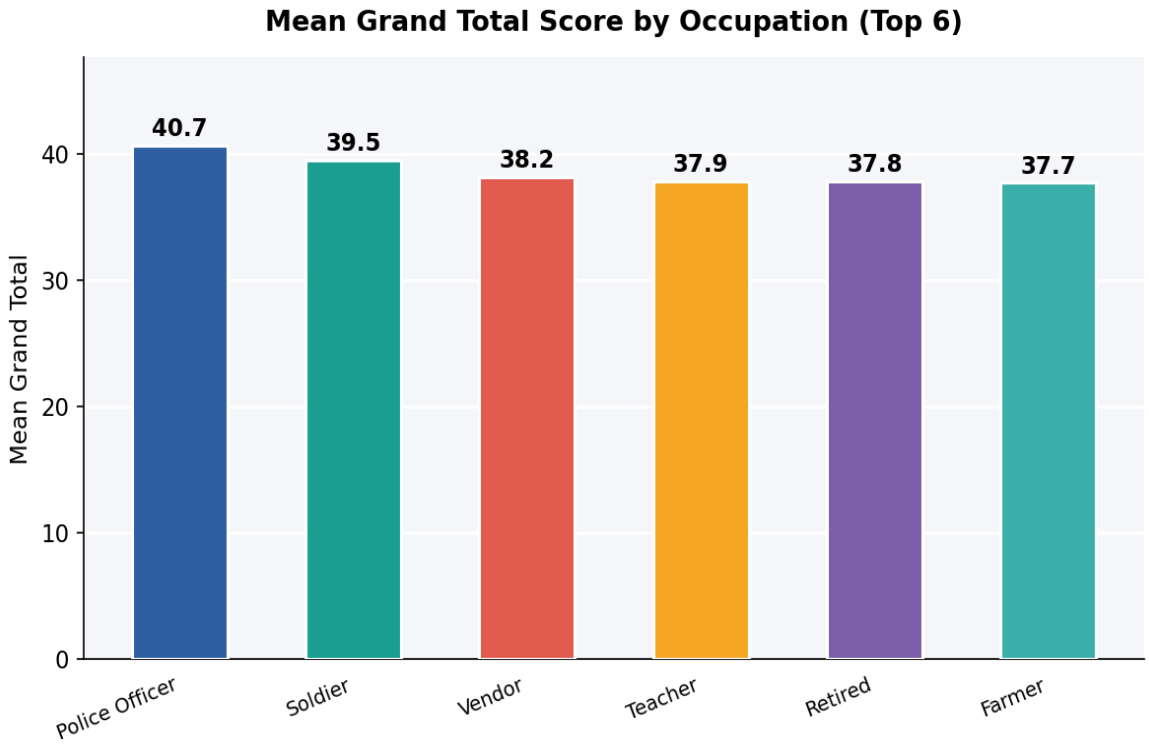

Table 4.4 Mean Grand Total Score by Occupation

4.4 NAVQ Questionnaire Analysis

Average Difficulty by Near-Activity Item (Q1–Q10)

Near vision activities were rated by participants on difficulty (0-3) and the most challenging tasks were identified. Items requiring the reading of small print (such as food packaging and medication labels and detailed near work had the highest level of difficulty. Conversely, the activities that had the lowest difficulty scores involved writing and reading your own writing, viewing the display and keyboard on a computer and doing hobbies like playing card games. The samples overall NAVQ total mean was 19.91 (SD 9.94) out of possible 30 indicating a moderate to high degree of perceived difficulty. The ranking pattern is consistent with the known loss of amplitude of accommodation, and presbyopia is mainly a problem with tasks that require close focus and fine spatial reduction.

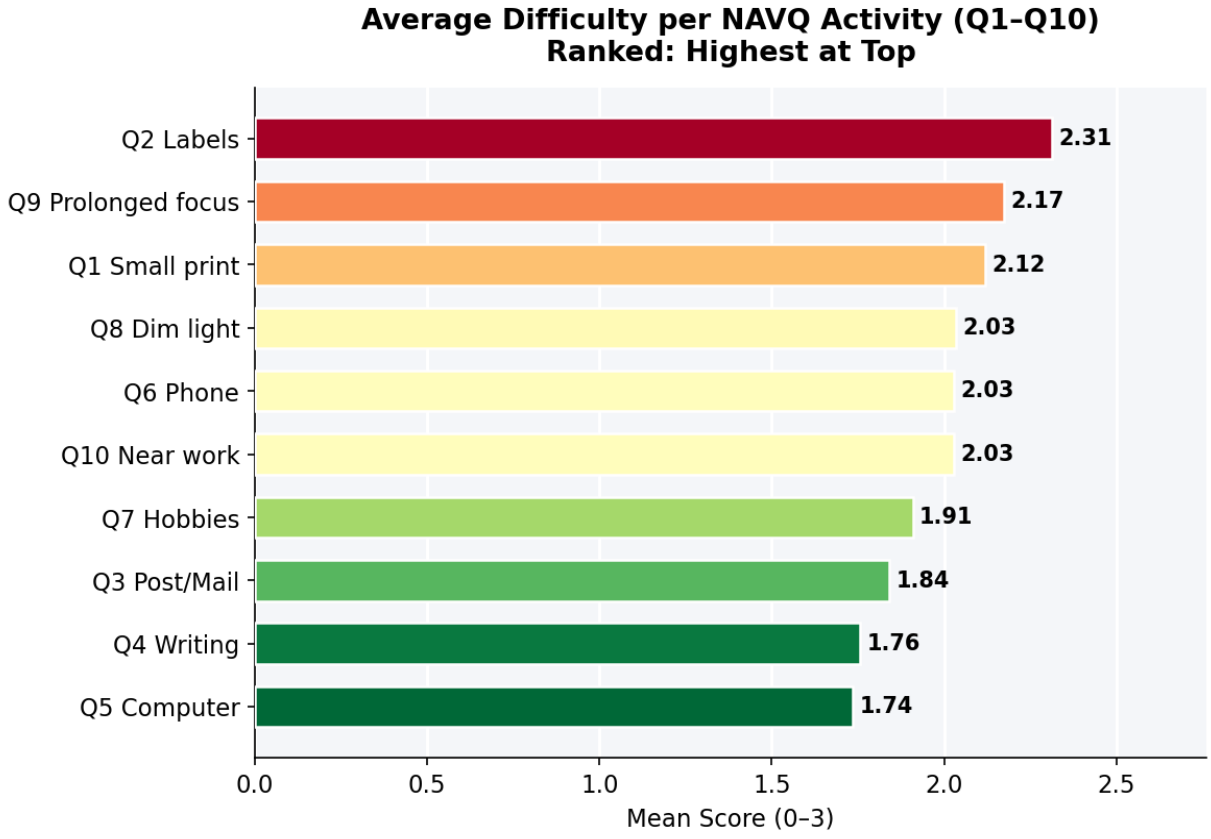

Figure 4.4Average Difficulty per NAVQ Activity (Ranked Highest to Lowest)

4.5 Comparison of Mean Section Scores

The grand total and average scores for each of the 3 questionnaires sections, were compared. In comparison to the means for section 2 (psychosocial impact M =10.87/20 SD =4.12) and section 3 (functional limitations M =5.46/10 SD =2.74) and NAVQ Total (Q1 –Q10 possible range 0 -30) had a mean of 19.91(SD =9.94). The average Grand Total (the sum total of all sections, with a possible range of 19-46 was 36.24 (SD =5.42). The results show that participants had a moderate to high difficulty with near activities, with the NAVQ items making up the longest portion of all the total score. Although the psychosocial and functional limitation had lower absolute scores, they still had a significant impact in comparison to their shorter scales.

All questionnaire sections are shown in comparison to the mean scores in figure 4.5. As expected, the NAVQ Total (M = 19.91) is higher in scale than the sub-section totals given that it is composed of 10 items. The Mean for Grand Total was 36.24.

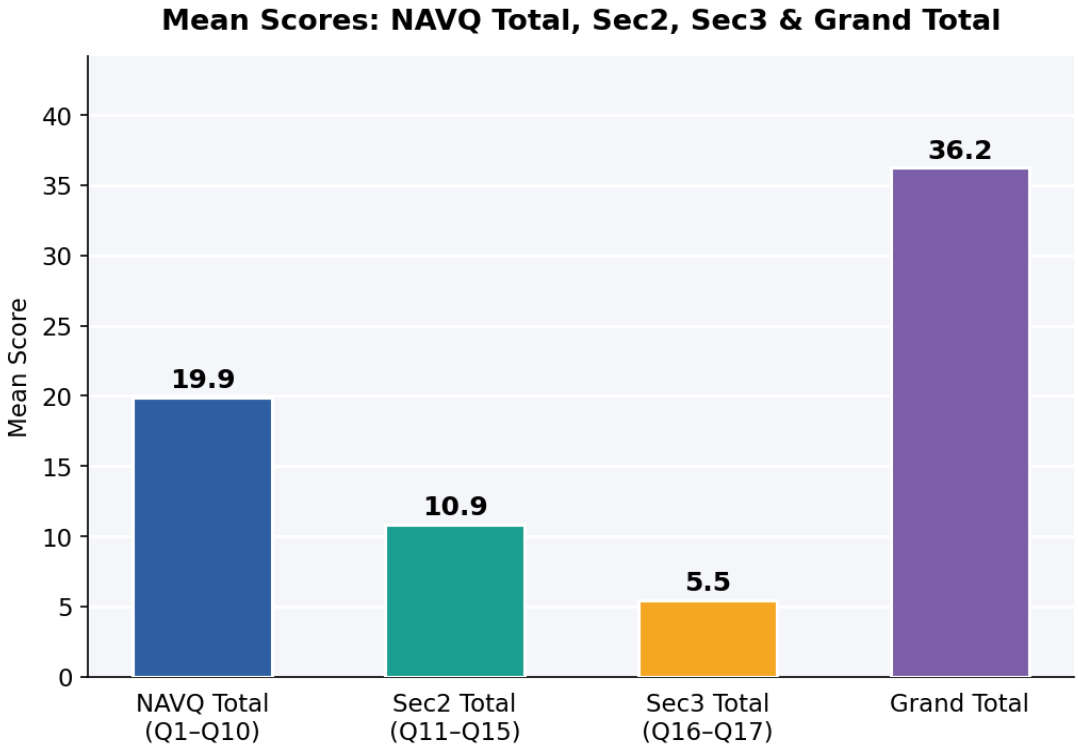

Figure 4.5 Mean Scores: NAVQ Total, Sec2 Total, Sec3 Total, Grand Total

4.6 Satisfaction & Demographic Score Comparisons

Overall Satisfaction by Gender

Box plots with jittered data points superimpose where used to compare overall satisfaction scores between males and female participants (figure 4.6). There was generally no difference in the distributions of the two gender groups; there was no obvious difference in the interquartile ranges of the meridian or outliers. Based on statistical testing, no significant differences were found between males and females in overall satisfaction.

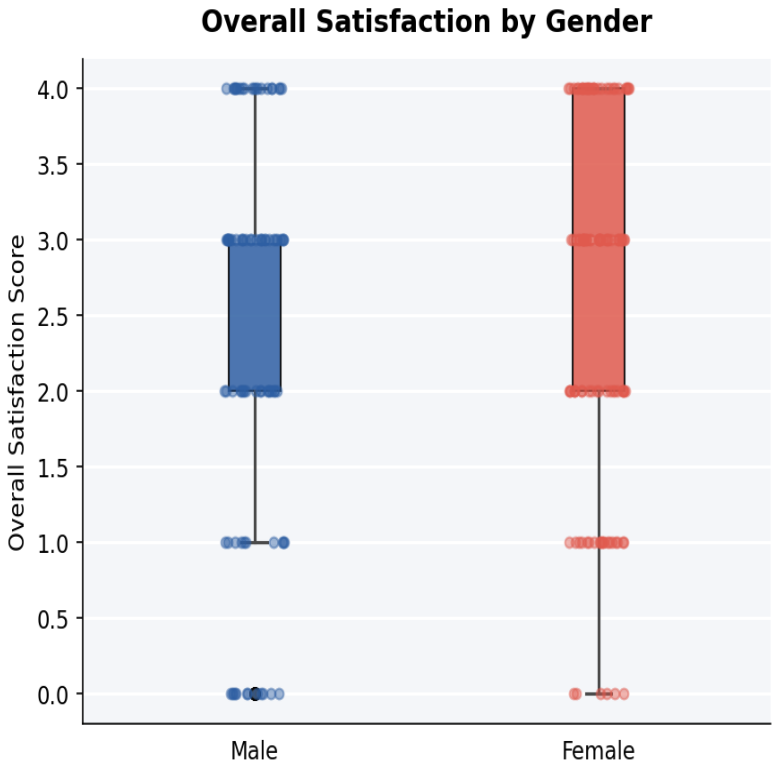

Figure 4.7. Box Plot: Overall Satisfaction by Gender

4.7 Age vs Grand Total Score

The association between age and Grand Total score was investigated using a scatter plot with a Pearson regression trend line (Figure 4.7). Older participants tended to report higher overall questionnaire scores according to a moderately positive correlation (r =0.427, <0.001)

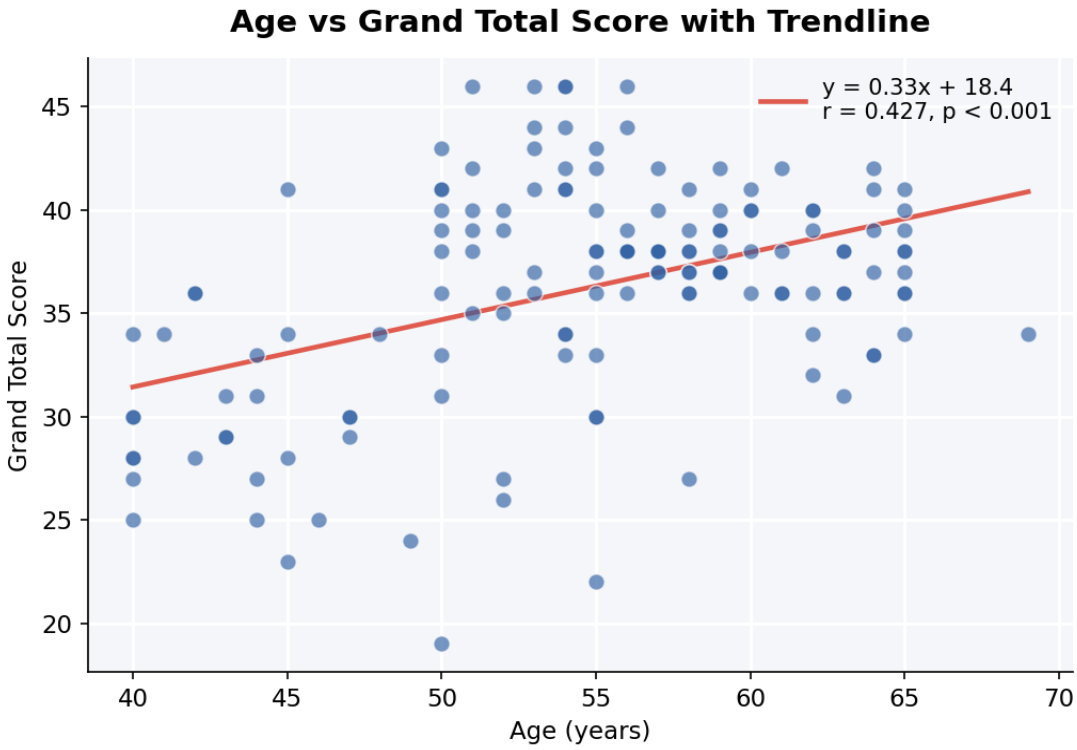

Figure 4.8 Scatter Plot: Age vs Grand Total with Trendline

4.8 SPSS-Style Statistical Results

Descriptive Statistics

Table 3 presents descriptive statistics for key continuous variables.

Variable	N	Mean	Median	SD	Min	Max
Age	198	51.97	51.50	7.50	40.0	69.0
NAVQ Total (Q1-Q10)	144	19.91	23.00	9.94	0.0	30.0
Sec2 Total (Q11-Q15)	144	10.87	10.00	4.12	5.0	20.0
Sec3 Total (Q16-Q17)	144	5.46	4.00	2.74	2.0	10.0
Grand Total	144	36.24	37.00	5.42	19.0	46.0

Table 1. Descriptive Statistics for Key Variables

4.9 Independent Samples t-Test: NAVQ Total by Gender

A Welch's independent samples t-test was conducted to examine whether NAVQ Total scores differed between male and female participants.

Table 4 t-Tests

Male (n = 62)	M = 19.94, SD = 9.89
Female (n = 82)	M = 19.89, SD = 10.04
Welch's t (df=142)	t = 0.027, p = 0.979
Cohen's d	d = 0.005
Decision (α=0.05)	Fail to reject H_0 — No significant gender difference

Interpretation: There was no statistically significant difference in NAVQ Total scores between males and females [t (142) = 0.027, p = .979]. The effect size was negligible (d = 0.005), indicating that gender did not meaningfully influence near-activity difficulty in this sample.

4.10 One-Way ANOVA: NAVQ Total by Education Level

A one-way ANOVA was performed to determine whether NAVQ Total scores differed across education levels.

Table 5 One Way Anova

Primary (n = 21)	M = 23.71, SD = 7.60
O Level (n = 65)	M = 17.88, SD = 10.56
Tertiary (n = 56)	M = 21.34, SD = 9.27
F (2, 139)	F = 3.639, p = 0.029

Decision (α=0.05)	Reject H_0 — Significant difference across education groups

Interpretation: A significant effect of education on NAVQ Total scores was found [F (2, 139) = 3.639, p = .029]. Post-hoc analyses (e.g., Tukey HSD) would be needed to identify which specific pairs of groups differ. Participants with only Primary education reported the highest mean difficulty scores.

4.11 Pearson Correlation Analysis

Table 6 presents Pearson correlation coefficients between selected variables.

Age ↔ Grand Total (n=143)	r = 0.427, p < 0.001 — Moderate positive correlation
Overall Satisfaction ↔ Grand Total	r = 0.496, p < 0.001 — Moderate positive correlation

Table 6 Pearson Correlations

Interpretation: Age was moderately positively correlated with Grand Total [r (141) = .427, p < .001], indicating that older participants reported higher overall questionnaire scores. Overall Satisfaction also showed a moderate positive correlation with Grand Total [r (142) = .496, p < .001], suggesting that participants with greater visual difficulty reported lower satisfaction levels.

4.12 Reliability Analysis (Cronbach's Alpha)

Internal consistency of the NAVQ scales was assessed using Cronbach's alpha (Table 3).

Table 7: Cronbach's Alpha for NAVQ Sub-Scales

NAVQ Items Q1–Q10 (k=10, n=143)	α = 0.980 — Excellent internal consistency

Section 2 Items Q11–Q15 (k=5, n=144)	α = 0.938 — Excellent internal consistency

Table 7. Cronbach's Alpha for NAVQ Sub-Scales

Interpretation: Both scales demonstrated excellent internal consistency (α > 0.90), indicating that the questionnaire items are highly correlated and measuring a coherent underlying construct. This supports the use of total scores as reliable indicators of near-vision impact.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

The study was carried out in Bindura Provincial Hospital. The 199 participants included staff at the hospital, those who had come for treatment of other conditions, some were referred from other hospitals while others were accompanied by friends and relatives. All the participants had presbyopia and the mean age was within the presbyopia range. They were of a relevant age as these are still economically active people, and untreated presbyopia can result in reduced productivity and impact on household activities such as cooking and sewing.

5.2 How it affects people's lives

The mean of the NAVQ total scores were 19.91/30 indicating moderate to high level of disability in relation to presbyopia and daily tasks. Small print reading (medication labels) was the most difficult activity and with serious safety implications. Patients can read the wrong expiration date or wrong dosage instructions, which can be a health risk. This is corroborated by studies in other developing countries that associate presbyopia with medication errors (Patel et al.,2018). However, tasks involving gross vision are spared until early to moderate presbyopia.

The moderately positive correlation ($r=0.427$) between age and grand total is indicative of the progressive nature of presbyopia as the amplitude of accommodation reduces with increase in age. The most difficulties with near vision tasks were among the older patients, 50 years and up. Contrary to popular belief and studies on presbyopia, females were more affected by presbyopia than males (Fricke et al., 2018); however, this study has shown that there is no statistically significant difference ($p=0.079$). The reason is that it was equally possible for males and females attending to get corrected. It is also because the NAVQ was used to measure the level of difficulty and not access to care. The cultural norms in peri-urban also differs with other settings.

The NAVQ score for Primary education (M=23.71) was highest compared to O-Level (M=17.88) and tertiary (M=21.34). This can be attributed to the fact that there is lower health literacy and less affordability of correction. It is also in line with similar education gradient that have been reported in Nigeria (Bodunde et al,2020). Near vision jobs (e.g. clerical, technicians) had a higher mean score than drivers and general laborers. This directly demonstrates the visual demands of tasks that involve a high level of sustained small print or fine detail processing; this was more difficult. Near correction programs should be targeted to these occupation groups from the workplace.

5.3 Implication

Regular and routine screening should be part of primary care for all 40+ year olds. Employers who employ people who need to do near work, e.g. clerical workers and technicians, should make it an affordable option in the occupational health package to provide them with glasses. Health communication should also be enhanced including low literacy level inputs (pictograms) explaining to primary educated adults how it works and how to correct the effects of presbyopia. Large print labels and counseling should also be provided in the pharmacy, to prevent mistakes in presbyopic patients.

5.4 Study is limited to the four schools of the division.

There are several limitations in this study that should be taken into account when interpreting the results. The first important drawback was the lack of measurement of barriers. Cost, awareness or access to glass was not measured directly so we are unable to design a targeted intervention. The second limitation was collecting data at a single site. This implies that findings are not produced in rural areas and for non-clinic population. Thirdly, the data was entirely self-reported using NAVQ questionnaire which there is a possibility of recall bias. Lastly, the clinical sample employed may over represent those who are more health aware or who have better access to services, as most of the participants were already attending the clinic for eye treatment or other services. This study is therefore limited in fully revealing the burden of presbyopia in the general population (40-65 years) in Zimbabwe.

5.5 Recommendation

Based on the findings and limitation of this, recommendations are proposed for future purpose. First, the study should be longitudinal, obtaining information prior to presbyopia correction, in order to see that presbyopia correction actually reduces impacts. Secondly, multi-community-based sampling should also be conducted which helps in increasing the generalizability.

Health education on the issue of presbyopia should be converted to simpler materials such pictograms as the majority of group of people with presbyopia had only primary education. Also, hospitals and pharmacies should use large print on the medication tables as reading smaller objects was the most difficult activity. Near vision screening should also be provided as part of routine screening and training of primary nurses to carry out near visual acuity should also be provided.

5.6 Conclusion

The present study reveals that near difficult tasks are one of the major problems among the patients aged 40-65 years in Bindura Provincial Hospital due to presbyopia. The impact is highest on small print reading (medication labels, food packaging) and mostly those with primary education and with visual demanding occupation are affected most severely. The burden is increased with age, but not with gender. The NAVQ is a good tool for this population. But in this study information on impact after and before the correction of the presbyopia was not obtained, which is an important evidence gap. That should be accounted for in future studies. In the interim, interventions like use of large print on medication bottles and workplace interventions can immediately enhance quality of life and patient safety.

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BINDURA UNIVERSITY OF SCIENCE EDUCATION

INFORMED CONSENT FORM

Research Title: Assessing the impact of presbyopia on quality of life of patients aged 40-65 years at Bindura Provincial Hospital.

Researchers: Grace Gatawa and Tafadzwa Kore

Project description

Presbyopia, an age-related condition affecting near vision, is highly prevalent in low and middle-income countries like Zimbabwe, where uncorrected refractive errors (UREs) contribute significantly to visual impairment. Presbyopia is an age-related visual condition characterized by the gradual loss of the eye's ability to focus on near objects. It typically becomes noticeable between the ages of 40 and 45 and affects nearly all individuals as they age. Despite being a universal and physiologically expected condition, presbyopia can substantially affect visual function, work performance, and social well-being, particularly in settings where access to affordable corrective lenses is limited. In Zimbabwe, visual impairment including presbyopia can interfere with daily functioning, reduce productivity, and affect the psychological and social well-being of affected individuals. At Bindura Provincial Hospital, understanding the burden of presbyopia and its implications on patients' quality of life is critical for guiding interventions that promote visual health and improve patient outcomes.

Bindura Provincial Hospital, located in Mashonaland Central Province, Zimbabwe, serves a population in which visual health concerns are often underprioritized, making it imperative to understand the burden of presbyopia and its implications on patients' quality of life. Bindura Provincial Hospital incorporates both people from urban areas and rural areas and presbyopia impacts their quality of life almost differently. This study aims to assess the impact of presbyopia on quality of life (QoL) among patients aged 40-65 at Bindura Provincial Hospital.

Objectives

1. To determine the prevalence of presbyopia among patients aged 40-65.

2. To assess the impact of presbyopia on daily activities such as reading, working and social interactions of patients attended at Bindura Provincial Hospital.

3. To determine the relationship between demographic characteristics (age, gender, occupation) and quality of life outcomes among patients with presbyopia.

4. To identify barriers to obtaining and using presbyopic corrections.

Purpose of the study

The purpose of this study is to assess how presbyopia impacts daily activities, emotional well-being, productivity, and overall quality of life of patients aged 40-65 at Bindura Provincial Hospital. Ophthalmologists and optometrists often focus on clinical measurements (visual acuity, refraction etc.) rather than patient-reported outcomes. The findings will help improve eye care services and inform strategies to better manage presbyopia.

Voluntary Participation

You have been invited to participate in this study because you are between the age of 40 and 70 years and may be experiencing or at risk of presbyopia. Your participation in this study is entirely voluntary. You are free to withdraw or to refuse to participate at any time without giving a reason and this will not affect your current or future medical

care at this clinic in any way. Any information collected from you up to that point may still be used in a confidential manner unless you request otherwise.

Procedures

If you agree to participate, your involvement in this study will consist of one visit, lasting approximately 60 minutes. During this visit, you will be asked to complete the following:

1. Screening and Demographic Information

We will first collect basic demographic data, including age, gender, education level and occupation. We will also ask about your general eye health, the date of your presbyopia diagnosis, and your current method of vision correction if there is any. You will undergo a non-invasive clinical examination which includes distance and near visual acuity and subjective refraction.

2. Quality of Life Questionnaires

You will be asked to complete the NAVQ which is a standardized, validated, questionnaire. The questionnaire is paper- based that ask about your experiences with vision and daily activities.

Possible Risks

This study has minimal risk. Potential concerns include:

- Time burden: The primary burden is the time required to complete the questionnaires and assessments.
- Discomfort: Mild psychological discomfort when responding to personal or lifestyle-related questions. Some participants may find certain questions about their vision or quality of life to be mildly personal or uncomfortable. Participants may skip any questions they are not comfortable answering.
- Fatigue: If you experience eye strain or fatigue during the questionnaires, you may request a break at any time.

Benefits

- Direct benefits: Participants may gain awareness of their visual status.
- Indirect benefits: Findings may contribute to improved diagnosis, management, and policy development for presbyopia care. Your participation will contribute to a better understanding of presbyopia and may help improve eye care services and patient outcomes in the future.

Confidentiality

- We will follow strict ethical and legal guidelines to ensure your confidentiality.
- All information collected during this study will be kept strictly confidential. Your identity will not be disclosed in any reports or publications. No individual participant will be identifiable. You will be given a unique study ID number, and your name will not appear on any questionnaire or data analysis file.
- All data will be stored on encrypted, password-protected institutional servers. Paper records will be stored in a locked office.

CONSENT STATEMENT

By signing below, I confirm that:

1. I have read and understood the information in this consent form (or it has been read and explained to me).
2. I have had the opportunity to ask questions and have had them answered to my satisfaction.
3. I understand that my participation is voluntary and I am free to withdraw at any time, without giving a reason, and without my medical care or legal rights being affected.
4. I understand that the data collected about me will be anonymized and used for the purposes of this research, including publication.
5. I agree to the use of my anonymized data for future, ethically approved research studies related to vision and quality of life.
6. I agree to take part in the above study.

Participant's name …….

Participant's signature ……

Date ……

Researcher's name …….

Signature ……

Date …….