THE EFFECTS OF VISUAL IMPAIRMENT ON THE QUALITY OF LIFE OF ADULT PATIENTS IN BENIN CITY

BY

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DEPARTMENT OF OPTOMETRY

FACULTY OF LIFE SCIENCES

UNIVERSITY OF BENIN

BENIN CITY, EDO STATE.

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CERTIFICATION AND APPROVAL

This is to certify that this research project titled: **THE EFFECTS OF VISUAL IMPAIRMENT ON THE QUALITY OF LIFE OF ADULT PATIENTS IN BENIN CITY** was carried out by **CHIBUGO CHUKWUNWIKE VICTOR** in the Department of Optometry, Faculty of Life Sciences, University of Benin in partial fulfillment of the requirement for the Doctor of Optometry degree in the 2021/2022 Academic Session

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DEDICATION

I Chibugo Chukwunwike Victor, dedicate this work to all the visually impaired adult patients that participated in the study and to my mom who has continually encouraged me to pursue my educational goals, and all my friends who have continually supported me at all times. To my lecturers who have shared with me the knowledge that has made it possible for me to complete this project. And most of all to God through whom all things are possible.

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Special thanks to God Almighty for keeping me alive till this day. Thanks for being there for me and giving me the strength to continue.

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ABSTRACT

In our everyday life as humans, we carry out activities whereby we rely majorly on our vision. Vision is therefore important for an individual to have a good quality of life. This study was carried out to determine the effects of visual impairment (VI) on the quality of life of adult patients at the University of Benin Teaching Hospital (UBTH), also the quality of life in different demographic variables was compared. It is a quantitative observational cross-sectional study that carried out on adult male and female patients above 18 years of age with visual acuity (VA) of less than 6 out of 12. The 150 sample size excluded subjects with mental illness. Demographics and quality of life data were collected through low vision quality-of-life questionnaire at UBTH from August to September 2023. From the 150 visually impaired patients that participated in this study, 85 males participated as compared to 65 females with a mean age of 55.77 ± 12.73 for males and 57.33 ± 11.24 for females. 129(86%) patients were married while 21(14%) were unmarred. Eighteen 18% of the participants were diabetic, Eight 8% were hypertensive. Only three 3% of the participants were both diabetic and hypertensive. : Patients that were older than 60 years, uneducated, unmarried, and women were most likely to have a lower quality of life. In cases where chronic diseases are associated with higher rates of visual complications and poor quality of life the importance of eye examinations and effective rehabilitation services cannot be overemphasized.

CHAPTER ONE

1.0 INTRODUCTION

Vision is a vital tool for functioning in daily activities, for perceiving beauty, and for achieving personal fulfillment. It allows us to connect with our surroundings, keeps us safe, and help maintain the sharpness of our minds. Our sense of sight is responsible for most of the information we absorb from our five combined senses. Many of the movements we perform, tasks we complete and personal interactions we make rely on vision in some way.

Quality of life (QOL) is defined by the World Health Organization as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". Standard indicators of the quality of life include wealth, employment, the environment, physical and mental health, education, recreation and leisure time, social belonging, religious beliefs, safety, security and freedom.

Vision-related quality of life is related to, but not identical to, visual function. Vision-related quality of life represents the degree to which vision impacts an individual's ability to complete activities of daily living and one's social, emotional and economic well-being. Some activities of daily living include feeding oneself, bathing, dressing, grooming, work, home making and others,

1.1 BACKGROUND INFORMATION

Visual impairment (VI) is a condition of reduced visual performance that cannot be remedied by refractive correction (spectacles or contact lenses), surgery or medical methods (DeCarlo, 2006).It results in functional limitations of the visual system that may be characterised by irreversible vision loss, restricted visual field and decreased contrast sensitivity, increased sensitivity to glare as well as decreased ability to perform activities of daily living, such as reading or writing (Kavitha *et al.,* 2015)

It has been affirmed that individuals with visual impairment have measurable vision, yet experience difficulties accomplishing visual tasks even with the use of refractive correction.These individuals are sometimes capable of enhancing their abilities to accomplish visual tasks with the use of compensatory low vision aids and/or environmental adjustments (Corn and Lusk, 2010)

This description of visual impairment is useful because it considers that individuals with visual impairment may not always display predictable clinical changes in visual function and that changes in functional vision may not always correlate to measurable changes in clinical findings (Corn, 2010).

In 1992, the World Health Organization (WHO) added a functional dimension to the definition of visual impairment.This definition is stated as: "A person with low vision is one who has impairment of visual functioning even after treatment and/or standard refractive correction, and has VA of less than 6/18 to light perception, or a visual field of less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for the planning and/or execution of a task."(WHO, 1992)

This definition refers to the visual acuity (VA) of the better eye with the best possible refractive correction.

According to the International Classification of Diseases, 10th revision (ICD-10), Visual Impairment may be classified into four levels, namely mild or no visual impairment, moderate visual impairment, severe visual impairment and blindness. Moderate and severe visual impairment are collectively categorised as VA of less than 6/18, but equal to or better than 6/120 in the better eye with the best refractive correction. When the extent of the visual field is considered, an individual with a visual field radius of no greater than 10 degrees around the central point of fixation in the better eye is placed in the third category (blindness).(WHO-ICD 1O, 2016).This research study utilizes this classification of visual impairment without the visual field being put into consideration.

1.2 SIGNS OF VISUAL IMPAIRMENT

There are signs associated with visual impairment that can be observable by a patient's guardian or a physician, these signs can serve as evidence that an individual may be suffering from visual impairment. Some of these signs include:

- They begin to bump into things.
- They move hesitantly or walk close to a wall.
- They grope for objects or touch them in an uncertain way.
- They squint or tilt their head to see.
- They request more or different lighting.
- They hold books or other reading matter close to their face.
- They drop food or silverware when eating.

- They have trouble making out faces, the lettering on signs, etc.
- They do not notice stains on clothing or wear mismatched clothes.
- They act visually disoriented or confused in a familiar place.
- They trip on area rugs.
- They complain of migraine headaches that give them blurry vision.
- They cannot see anything at night.

All of these signs of visual impairments may serve as evidence that a visually impaired individual has problems with everyday activities. While these are common behaviors of a person experiencing visual impairments, a diagnosis can be made only by a licensed eye doctor. If you believe that someone in your life is experience an impairment, please encourage them to seek an eye exam.

1.3 CAUSES OF VISUAL IMPAIRMENT

Globally, the leading causes of blindness and moderate and severe visual impairment include uncorrected refractive error, cataract and macular degeneration (WHO, 2007; Pascolini, 2012;Resnikoff, 2008;Bourne *et al.,* 2013).It was further reported that the magnitude of individuals affected by blindness and moderate and severe visual impairment caused by uncorrected refractive error increased from 6.3 million and 88.0 million in 1990 to 6.8 million and 101.2 million in 2010, respectively. The causes of visual impairment differ significantly between regions, macular degeneration being greatest in high-income regions (Bourne *et al.,* 2013).

In Africa, the main causes of moderate and severe visual impairment in adults are cataracts and diseases affecting the cornea and retina (WHO 2007, Oduntan 2005).In Sub-Saharan Africa, the

prevalence of cataracts causing visual impairment declined from 24.2% in 1990 to 17.8% in 2010; however, the prevalence of macular degeneration and glaucoma increased from 2.8% and 1.5% in 1990 to 4.8% and 2.6% in 2010, respectively (Bourne *et al.,* 2013).Specifically in South Africa, the main causes of moderate and severe visual impairment include cataract, corneal opacity, glaucoma, refractive error and retinal diseases such as retinitis pigmentosa, Stargardt's disease, Usher's syndrome and Leber's Congenital Amaurosis (Oduntan 2005, Sacharowitz 2005). Recent studies undertaken in South Africa confirmed that cataract, uncorrected refractive error, posterior segment diseases (optic atrophy, trauma and macular hole) and glaucoma were the main causes of moderate and severe visual impairment (Cockburn *et al.,* 2012;Maake, 2015).

1.4 DISEASES THAT LEAD TO VISUAL IMPAIRMENT

Some of the diseases that can cause visual impairment as particular to this research are:

1.4.1 Cataract

Cataract is the clouding of the normally clear lens of the eye.People who have cataracts usually complain of seeing through cloudy lenses is a bit like looking through a frosty or fogged-up window. It is more difficult to read, drive a car (especially at night) or see the expression on a friend's face with the clouded vision caused by cataracts. Most cataracts develop slowly and don't disturb a person's eyesight initially. But with time, cataracts will eventually interferes with a person's vision. At first, stronger lighting and eyeglasses can help an individual deal with cataracts. But if impaired vision interferes with a person's day to day activities, it might be advisable for such an individual to carry out a cataract surgery. Fortunately, cataract surgery is generally a safe and effective procedure.

Types of cataract

There are majorly five types of cataract;

Age-related cataracts

As an individual gets older, a cataract can occur because of the natural changes in the lens of the person's eye. This is the most common type of cataract. This type of cataract may be more likely to develop if a person has undergone certain eye surgeries, like glaucoma surgery, takes steroidal medications used to treat some health problems, like arthritis or allergies, smokes, drinks too much alcohol, have a family history of cataracts or is diabetic

Traumatic cataracts

Serious eye injuries can damage a person's lens and cause a cataract. The cataract could form soon after the injury or it could form many years later.

Radiation cataracts

Some types of radiation can also cause cataracts. Ultraviolet (UV) rays from the sun and radiation treatment for cancer are some examples of radiations that can cause cataract.

Pediatric cataracts

Children also can be diagnosed of cataracts too. They can be born with cataracts (congenital cataracts) or develop them later in life.

Cataracts in children are rare, and they're usually genetic, that is; they run in families. Serious problems during pregnancy or illnesses during childhood, like uveitis or tumors in the eye are some factors that could lead to a child developing cataract. Children can also be diagnosed of cataracts for the same reasons as adults — like eye injuries, radiation, or steroids.

When pediatric cataracts are large enough to cause visual problems, they need to be treated right away. It’s important to treat these cataracts early so that a child doesn’t develop other vision problems, like amblyopia (lazy eye).

Some pediatric cataracts are small that they don't affect a child’s vision. However these smaller cataracts should be observed over time by a pediatric eye doctor to make sure they don’t cause vision problems.

Secondary cataracts

It is possible for an individual to develop a scar tissue in the eye after a cataract surgery is performed and this can lead to the person's vision becoming cloudy again. This is called a secondary cataract.Other names for it are posterior capsule opacification or after cataract. Secondary cataracts are common. In fact, up to 2 out of 5 people who have cataract surgery usually develops a secondary cataract.

The treatment for secondary cataracts is usually painless and quick. An eye doctor can use a laser to make an opening in the cloudy part of the lens — this is called YAG laser capsulotomy and most people will notice their vision is back to normal in a few days.

Pathophysiology of cataract

The lens is a transparent structure made up of fibers (modified epithelial cells) enclosed in a membranous structure called lens capsule. Lens matter consists of two main parts:

- Cortex (superficial part) - containing younger fibers
- Nucleus (deeper part) - containing older fibers

Many degenerative processes denature and coagulate lens proteins present in lens fibers by different mechanisms, which result in loss of transparency and, ultimately, cataract formation. The various mechanisms involved are disturbances occurring at any level of lens growth (congenital cataract),fibrous metaplasia of lens epithelium (subcapsular cataract),cortical

hydration between lens fibers (cortical cataract),deposition of certain pigments, i.e., urochrome (nuclear cataract).These processes lead to an opaque lens behind the pupil, making it extremely difficult for the patient to carry on with routine activities.

Cataract Treatment

Surgery is the only way to treat cataracts, but a patient might not need it right away. If an individual is diagnosed of cataract at an early stage, the person might be able to get by with a new prescription for glasses. A stronger lens can make your vision better for a while.

If a person has trouble reading, it is advisable to use a brighter illumination or a magnifying glass. If glare is an issue for such an individual, special glasses that have an anti-glare coating or properties can be prescribed. These can help a person drive at night. A person diagnosed of cataract at an early stage should keep close tabs on how the condition affects his or her vision. When vision troubles get in the way of performing daily activities especially if it makes driving dangerous, it's time for such an individual to consider surgery.

Cataract surgery

There are several kinds of operations for cataracts, but they all have one thing in common: The ophthalmic surgeon takes out the cloudy lens and replaces it with an artificial one. A person might feel a little uncomfortable with the idea of an operation on a sensitive spot like the eye. But it's a very common procedure. Local anesthesia can be used to numb the eye. A person can be awake but sedated, and won't feel anything. The procedure usually takes about 15 to 20 minutes, and a person doesn't need to stay overnight in an hospital. If a patient has cataracts in both eyes, the doctor usually waits until the first eye heals before surgery is performed on the second. More than 95% of people who have this done say they can see better afterward.

Small-incision surgery: This is also called phacoemulsification. The surgeon makes a tiny cut on the cornea.A small device is inserted in the eye that gives off ultrasound waves that break up the cloudy lens. Then, the surgeon takes out the pieces and puts in the artificial lens.

Large-incision surgery: This procedure is not carried out as often as the small incision surgery, but doctors sometimes suggest it for larger cataracts that cause more vision trouble than usual. It's sometimes called extracapsular cataract extraction. The surgeon takes out the clouded lens in one piece and swaps it out for an artificial one. A patient probably need a little more time to heal from this surgery than from the small-incision type.

Femtosecond laser surgery: In this operation, the surgeon uses a laser to break up the lens. As with the other types, they'll then put in the new lens. The doctor may suggest this if a person also have astigmatism, a curve of the cornea that makes vision blurry. The surgeon can treat that problem during the cataract surgery by using laser to reshape the cornea.(Melinda, 2021).

1.4.2 Hypertension

Hypertension, also known as high or raised blood pressure, is a condition in which the blood vessels have persistently raised pressure. Blood is carried from the heart to all parts of the body in the vessels. Each time the heart beats, it pumps blood into the vessels. The force of blood pushing against the walls of blood vessels (arteries) as it is pumped by the heart is what creates blood pressure. The heart has to pump harder when the blood pressure is high. Hypertension is a serious medical condition and can increase the risk of heart, brain, kidney and other diseases. It is a major cause of premature death worldwide, with upwards of 1 in 4 men and 1 in 5 women – over a billion people having the condition. The burden of hypertension is felt disproportionately

in low- and middle-income countries, where two thirds of cases are found, largely due to increased risk factors in those populations in recent decades.

How hypertension leads to vision loss

A person's eye contains many tiny blood vessels. When subjected to the long-term effects of high blood pressure, the following conditions can develop:

Retina blood vessel damage from hypertension (Hypertensive retinopathy): Blurred vision or the complete loss of sight can result when there is a lack of blood flow to the retina. People with diabetes and high blood pressure are at an even greater risk for developing this condition. Managing blood pressure is also the only way to treat hypertensive retinopathy.

Fluid buildup under the retina (choroidopathy): Distorted vision or, in some cases, scarring that impairs vision can occur when there is a buildup of fluid under the retina, the light-sensitive layer of tissue at the back of the eyeball.

In addition to threatening the anatomy of the eye, high blood pressure can also cause a stroke, which can impair the optic nerve or damage the area of the brain responsible for processing images.

Types of Hypertension

Primary Hypertension (also known as Essential Hypertension) – For almost 90% of the patients, the cause of this Hypertension is unknown. A doctor usually diagnose this type of hypertension when a patient's blood pressure is analysed after three or four visits. People who suffer from this hypertension type show no significant symptoms.

Secondary Hypertension – This Hypertension type occurs when there is an abnormality in the arteries that supply blood to the kidneys.

Other types of hypertension

Subtypes that fit within the categories of primary or secondary hypertension include:

Resistant hypertension: is the name given to high blood pressure that's difficult to control and requires multiple medications. Hypertension is considered resistant when a patient's blood pressure stays above the treatment target, even if three different types of blood pressure lowering medications, including a diuretic are being used. Individuals with resistant hypertension may have secondary hypertension where the cause hasn't yet been identified, prompting a search by their doctor for the secondary causes. Most people with resistant hypertension can be successfully treated with multiple drugs or with the identification of a secondary cause.

Malignant hypertension: is the term used to describe high blood pressure that causes damage to organs. This is an emergency condition. The most severe type of hypertension is malignant hypertension and it is characterized by an elevated blood pressure usually at >180 mm Hg systolic or >120-130 mm Hg diastolic, plus damage to multiple organs in the body.

Isolated systolic hypertension: is defined as systolic blood pressure above 140 mm Hg and diastolic blood pressure under 90 mm Hg. It is the most frequent type of hypertension in older adults.

Causes of hypertension

High blood pressure happens as the result of an underlying health condition or taking a certain medicine. Health conditions that can cause high blood pressure include:

- narrowing of the arteries supplying the kidneys
- kidney disease
- diabetes
- long-term kidney infections

- **sleep apnoea** – where the walls of the throat relax and narrow during sleep, interrupting normal breathing
- **glomerulonephritis** – damage to the tiny filters inside the kidneys
- **hormone problems** – such as an underactive thyroid, an overactive thyroid, Cushing's syndrome, acromegaly, increased levels of the hormone aldosterone (hyperaldosteronism), and phaeochromocytoma.
- **lupus** – a condition in which the immune system attacks parts of the body, such as the skin, joints and organs
- **scleroderma** – a condition that causes thickened skin, and sometimes problems with organs and blood vessels

Medicines that can increase blood pressure include:

- non-steroidal anti-inflammatory drugs (NSAIDs) – such as ibuprofen, aspirin and naproxen
- some pharmacy cough and cold remedies
- some herbal remedies – particularly those containing liquorice
- contraceptive pills
- steroids
- some recreational drugs – such as cocaine and amphetamines
- some selective serotonin-noradrenaline reuptake inhibitor (SSNRI) antidepressants – such as venlafaxine

Blood pressure may return to normal once a patient stop taking the medicine or drug in some of the above cases

Treatment of Hypertension

If the lifestyle of a patient is changed it can help control and manage high blood pressure. An health care provider can recommend that a patient should make lifestyle changes including: Getting regular physical activity, maintaining a healthy weight or losing weight, eating a heart-healthy diet with less salt, limiting consumption of alcohol, not smoking and even getting 7 to 9 hours of sleep daily.

Sometimes lifestyle changes aren't enough to treat high blood pressure. If they don't help, an health care provider can recommend medications to lower your blood pressure.

Medications

The type of medicine used to treat hypertension depends on a patient's overall health and how high a person's blood pressure is. Two or more blood pressure drugs often work better than one. Finding the medication or combination of medications that works best for a patient might take some time.

Medications used to treat high blood pressure include:

Diuretics (Water Pills): These drugs can help remove sodium and water from the body. They are often the first medications used to treat high blood pressure. There are different classes of diuretics, including thiazide, loop and potassium sparing. The ones recommended by a health care professional depends on a patient's blood pressure measurements and other health conditions, such as kidney disease or heart failure. Diuretics commonly used to treat blood pressure include chlorthalidone, hydrochlorothiazide (Microzide) and others.

Angiotensin-converting enzyme (ACE) inhibitors: These drugs block the formation of a natural chemical that narrows blood vessels. They help to relax blood vessels. Examples include lisinopril (Prinivil, Zestril), benazepril (Lotensin), captopril and others.

Angiotensin II receptor blockers (ARBs): These drugs also relax blood vessels. They block the action, not the formation, of a natural chemical that narrows blood vessels. angiotensin II receptor blockers (ARBs) include candesartan (Atacand), losartan (Cozaar) and others.

Calcium channel blockers: These drugs help relax the muscles of the blood vessels. Some can slow down heart rates.They include amlodipine (Norvasc), diltiazem (Cardizem, Tiazac, others) and others. Calcium channel blockers may work better for older people and Black people than do angiotensin-converting enzyme (ACE) inhibitors alone. It is not advised for a patient to consume grapefruit products when taking calcium channel blockers, this is because grapefruit increases blood levels of certain calcium channel blockers, which can be dangerous.

1.4.3 Glaucoma

Glaucoma is a disease that damages the eye's optic nerve. It usually happens when fluid builds up in the front part of a person's eye. That extra fluid increases the pressure inside the eye and this can cause damages to the optic nerve.

Glaucoma leads to vision loss

Aqueous humor is constantly being produced in the human eye. As new aqueous flows into the eye, the same amount should drain out. The fluid drains out through an area called the drainage angle. This process keeps pressure in the eye (called intraocular pressure or IOP) stable. In situations were the drainage angle is not working properly, fluid builds up and pressure inside the eye rises, damaging the optic nerve.

The optic nerve is made of more than a million tiny nerve fibers. It is like an electric cable made up of many small wires. A person will develop blind spots in your vision as these nerve fibres die. An individual may not notice these blind spots until most of the optic nerve fibers are dead. A person will become blind if all of the optic nerve fibres are damaged.

Types of Glaucoma

There are two major types of glaucoma.

Open-angle glaucoma:

This is the most common type of glaucoma. It happens gradually, where the eye does not drain fluid as well as it should (like a clogged drain). As a result, eye pressure builds and starts to damage the optic nerve. This type of glaucoma causes no vision changes and there is no symptom of pain first. Some people can have optic nerves that are sensitive to normal eye pressure. This means their risk of getting glaucoma is higher than normal. To find early signs of damage to the optic nerve regular eye exams are important.

Angle-closure glaucoma: (also called "closed-angle glaucoma" or "narrow-angle glaucoma")

This type happens when someone's iris is very close to the drainage angle in their eye. The iris can end up blocking the drainage angle. It is like a piece of paper sliding over a sink drain. When the drainage angle gets completely blocked, eye pressure rises very quickly. This is called an acute attack. It is a true eye emergency, and a patient should seek help from an ophthalmologist right away.

Many people with angle-closure glaucoma develop it slowly. This is called chronic angle-closure glaucoma. Patients usually don't know if they have it until the damage is severe or they have an attack because there are no symptoms at first. If not treated right away angle-closure glaucoma can cause blindness.

Management of Glaucoma

Glaucoma damage is permanent and cannot be reversed, But medicine and surgery can help to stop further damage.

Medication

Glaucoma is usually controlled with eyedrop medicine. Used every day, these eye drops lower eye pressure. Some do this by reducing the amount of aqueous fluid the eye makes. Others reduce pressure by helping fluid flow better through the drainage angle.

Prostaglandin analogs: include Xalatan® (latanoprost), Lumigan® (bimatoprost), Travatan Z® (Travoprost), and Zioptan™ (tafluprost), and Vyzulta™ (latanoprostene bunod), and they work by increasing the outflow of fluid from the eye. They have few systemic side effects but are associated with changes to the eye itself, including change in iris color and growth of eyelashes. Depending on the individual, one of these preparations may be more effective and produce fewer side effects. Latanoprost and some formulations of bimatoprost are now available in generic form. Tafluprost is a preservative-free prostaglandin analog.

Beta blockers: such as timolol are the second most often used class of medication and work by decreasing production of fluid. They are available in generic form and, therefore, may be less expensive. Timolol is also available in a preservative-free formulation. Systemic side effects of beta blockers can be minimized by closing the eyes following application or using a technique called punctal occlusion that prevents the drug from entering the tear drainage duct and systemic circulation.

Alpha agonists: [Alphagan®P (brimonidine), Iopidine®] work to both decrease production of fluid and increase drainage. Alphagan P has a purite preservative that breaks down into natural tear components and may be better tolerated in people who have allergic reactions to preservatives in other eye drops. Alphagan is available in a generic form.

Carbonic anhydrase inhibitors (CAIs): They reduce eye pressure by decreasing the production of intraocular fluid. These are available as eye drops [Trusopt® (dorzolamide), Azopt® (brinzolamide)] as well as pills [Diamox (acetazolamide) and Neptazane® (methazolamide)]. Except for brinzolamide, all CAIs are available in generic form.

Laser surgery

There are two main types of laser surgery to treat glaucoma. They help aqueous drain from the eye. These procedures are usually done in the ophthalmologist's office or an outpatient surgery center.

Trabeculoplasty: This surgery is for people who have open-angle glaucoma and can be used instead of or in addition to medications. The eye surgeon uses a laser to make the drainage angle work better. That way fluid flows out properly and eye pressure is reduced.

Iridotomy: This is for people who have angle-closure glaucoma. The ophthalmologist uses a laser to create a tiny hole in the iris. This hole helps fluid flow to the drainage angle.

Operating room surgery

Some glaucoma surgery is done in an operating room. It creates a new drainage channel for the aqueous humor to leave the eye.

Trabeculectomy: In this procedure the eye surgeon creates a tiny flap in the sclera. They usually also create a bubble (like a pocket) in the conjunctiva called a filtration bleb. It is usually hidden under the upper eyelid and cannot be seen. Aqueous humor will be able to drain out of the eye through the flap and into the bleb. In the bleb, the fluid is absorbed by tissue around the eye, lowering the pressure.

Glaucoma drainage devices: In this process an ophthalmologist usually implants a tiny drainage tube in the eye. The glaucoma drainage implant sends the fluid to a collection area (called a reservoir).The eye surgeon creates this reservoir beneath the conjunctiva. The fluid is then absorbed into nearby blood vessels.

Cataract surgery: For some people with narrow angles, removing the eye's natural lens can lower eye pressure. With narrow angles, the iris and the cornea are too close together. This can

cover (block) the eye's drainage channel. More space is created for fluid to leave the eye when the eye's lens is removed by cataract surgery. This can lower eye pressure.

1.4.4 Diabetes mellitus

Diabetes is a condition that happens when blood sugar (glucose) is too high. It develops when the pancreas doesn't make enough insulin or any at all, or when the body isn't responding to the effects of insulin properly. Diabetes affects people of all ages. Most forms of diabetes are chronic (lifelong), and all forms are manageable with medications and/or lifestyle changes. Glucose (sugar) mainly comes from carbohydrates in food and drinks. It's the body's major source of energy. The blood carries glucose to all the body's cells to use for energy.

When glucose is in the bloodstream, it needs a "key" to reach its final destination. This key is insulin (a hormone). If the pancreas isn't making enough insulin or the body isn't using it properly, glucose builds up in the bloodstream, causing high blood sugar (hyperglycemia).Over time, having consistently high blood glucose can cause health problems, such as heart disease, nerve damage and eye issues.

Types of diabetes

There are three main types of diabetes: type 1, type 2, and gestational diabetes (diabetes while pregnant).

Type 1 Diabetes:

Type 1 diabetes is thought to be caused by an autoimmune reaction (the body attacks itself by mistake). This reaction stops the body from making insulin. Approximately 5-10% of the people who have diabetes have type 1. Type 1 diabetes can be diagnosed at any age, and symptoms often develop quickly. If a person have type 1 diabetes, the person will need to take insulin every day to survive. Currently, no one knows how to prevent type 1 diabetes.

Type 2 Diabetes:

With type 2 diabetes, your body doesn't use insulin well and can't keep blood sugar at normal levels. About 90-95% of people with diabetes have type 2. It develops over many years and is usually diagnosed in adults. An individual may not notice any symptoms, so it's important to do blood sugar tested if a person is at risk. Type 2 diabetes can be prevented or delayed with healthy lifestyle changes, such as: Losing weight, eating healthy food and being active (CDC, 2023)

Gestational Diabetes:

Gestational diabetes develops in pregnant women who have never had diabetes. If a woman is diagnosed of gestational diabetes, her baby could be at a higher risk for health problems. Gestational diabetes usually goes away after a child is born. However, it increases the risk for type 2 diabetes later in life. The baby is more likely to have obesity as a child or teen and develop type 2 diabetes later in life.

Causes of Diabetes

Too much glucose circulating in the bloodstream causes diabetes, regardless of the type. However, the reason why a person's blood glucose level becomes high differs depending on the type of diabetes.

Causes of diabetes include:

Insulin resistance: Type 2 diabetes mainly results from insulin resistance. Insulin resistance happens when cells in the muscles, fat and liver don't respond as they should to insulin. Several factors and conditions contribute to varying degrees of insulin resistance, including obesity, lack of physical activity, diet, hormonal imbalances, genetics and certain medications.

Autoimmune disease: Type 1 diabetes and LADA happen when a person's immune system attacks the insulin-producing cells in the pancreas.

Hormonal imbalances: During pregnancy, the placenta releases hormones that cause insulin resistance. An individual may develop gestational diabetes if the pancreas can't produce enough insulin to overcome the insulin resistance. Other hormone-related conditions like acromegaly and Cushing syndrome can also cause Type 2 diabetes.

Pancreatic damage: Physical damage to the pancreas — from a condition, surgery or injury — can impact its ability to make insulin, resulting in Type 3c diabetes.

Genetic mutations: Certain genetic mutations can cause MODY and neonatal diabetes.

Diabetes can lead to vision loss

The early stages of diabetic retinopathy usually don't have any symptoms. Some people notice changes in their vision, like trouble reading or seeing faraway objects. These changes may come and go.

In later stages of the disease, blood vessels in the retina start to bleed into the vitreous (gel-like fluid that fills the eye). If this happens, a person may see dark, floating spots or streaks that look like cobwebs. Sometimes, the spots clear up on their own — but it's important to get treatment right away. Without treatment, scars can form in the back of the eye. Blood vessels may also start to bleed again, or the bleeding may get worse. This can result to severe vision loss (Cleveland Clinic, 2023)

Management of Diabetes

Diabetes is a complex condition, so its management involves several strategies. Management plans are highly individualized because diabetes affects individuals differently.

The four main aspects of managing diabetes include:

Blood sugar monitoring: Monitoring of blood sugar (glucose) is key to determining how well a treatment plan is working. It gives information on how to manage diabetes on a daily and sometimes even on an hourly basis. Blood sugar levels can be monitored by frequent checks with a glucose meter and finger stick and/or with a continuous glucose monitor (CGM).

Oral diabetes medications: Oral diabetes medications (taken by mouth) help manage blood sugar levels in people who have diabetes but still produce some insulin — mainly person's with Type 2 diabetes and prediabetes. People with gestational diabetes may also need oral medication. There are several different types. Metformin is the most common.

Insulin: People with Type 1 diabetes need to inject synthetic insulin to live and manage diabetes. Some people with Type 2 diabetes also require insulin. There are several different types of

synthetic insulin. They each start to work at different speeds and last in the body for different lengths of time. The four main ways an individual can take insulin include injectable insulin with a syringe (shot), insulin pens, insulin pumps and rapid-acting inhaled insulin.

Diet: Meal planning and choosing a healthy diet are key aspects of diabetes management, as food greatly impacts blood sugar. If an individual takes insulin, counting carbs in the food and drinks the person consumes is a large part of management. The amount of carbs a person eats determines how much of insulin is needed at meals. Healthy eating habits can also help in the management of body weight and the reduction of heart disease risk.

Exercise: Physical activity increases insulin sensitivity (and helps reduce insulin resistance), so regular exercise is an important part of management for all people with diabetes.

Due to the increased risk for heart disease, it's also important to maintain a healthy weight, normal blood pressure, cholesterol level.

1.5 STATEMENT OF PROBLEM

Vision loss has a significant impact on the lives of those who experience it as well as on their families, their friends, and society. The complete loss or the deterioration of existing eyesight can feel frightening and overwhelming, leaving those affected to wonder about their ability to maintain their independence, pay for needed medical care, retain employment, and provide for themselves and their families. Numerous studies have shown that vision impairment is often associated with various negative health outcomes and poor quality of life (Chia *et al.,* 2006; Langelaan *et al.,* 2007).

In Benin City, Edo state Nigeria there are visually impaired individuals that face problems and challenges associated with visual impairment which may include social isolation, difficulty walking, a higher risk of falls and fractures, and a greater likelihood of early entry into nursing or

care homes. It was therefore important to carry out a study to find out the possible causes and effects of visual impairments on the quality of life of adult individuals in Benin City so as to help propose interventions and recommendations for the visually impaired population.

1.6 AIM OF STUDY

The aim of this study was to determine the effects of visual impairment on the quality of life of adult patients visiting the ophthalmic complex in the University of Benin Teaching Hospital, Benin City.

1.6.1 OBJECTIVES OF THE STUDY

1. To evaluate the causes of visual impairment.
2. To evaluate effects of visual impairment on the quality of life.

1.6.2 RESEARCH QUESTIONS

- What are the causes of visual impairment?
- What are the effects of visual Impairment on the quality of life.

1.6.3 SIGNIFICANCE OF STUDY

- Evaluation of the effects of visual impairment on the quality of life of adult patients reporting at the University of Benin Teaching Hospital, Benin City can help buttress the need in choosing suitable management or modifying existing management plans for patients with various degrees of visual impairment; either by prescription of low vision aids or other visual rehabilitation programs.

- This study can also help provide a framework, contribution or an addition to the existing literature on this subject matter.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 PREVALENCE OF VISUAL IMPAIRMENT

More than 90% of individuals with visual impairment live in developing countries. This geographical disparity may be attributed to a higher prevalence of conditions related to poverty or environmental conditions and poor access to health care services in developing countries (Watkins, 2001).In terms of gender, women are at a higher risk of visual impairment because of longer life expectancies and lack of access to health care services especially in rural areas (WHO, 2007).The global prevalence of blindness is greater in women than in men and it has been discovered that for blindness, this gender disparity is highest in high-income regions and lowest in Sub-Saharan Africa. It has also been hypothesised that this low gender disparity in Sub-Saharan Africa may be because of onchocerciasis, which is more prevalent in men than women in endemic African regions (Stevens *et al.,* 2013).

The prevalence of visual impairment varies depending on whether presenting vision or best-corrected vision is reported (Murty, 2012).In 2002, it was estimated that with best-corrected vision there were 161 million individuals with visual impairment globally (Resnikoff, 2009).However, when the prevalence of uncorrected refractive error was included, this value increased substantially to 314 million individuals with visual impairment. This implies that an additional 153 million individuals were visually impaired from uncorrected refractive error alone (Resnikoff, 2008).

In Africa, the total number of individuals with visual impairment decreased slightly from 26.8 million in 2002 to 26.3 million in 2010..There was an overall decline worldwide of approximately 10% in the total number of individuals with visual impairment from 314 million to 285 million, of which an estimated 6.6% were children younger than 14 years (Pascolini, 2012; Resnikoff, 2008).

The observed decrease in the prevalence of visual impairment globally and in Africa may be attributed to the achievements of the VISION 2020: Right to Sight initiative by the WHO and the International Agency for the Prevention of Blindness (IAPB) that was implemented in 1999 (Ackland, 2010). Some of these achievements include a fivefold increase in the number of cataract operations performed in India, decrease in blindness because of trachoma and onchocerciasis, and reduction in childhood blindness as a result of vitamin A supplementation, immunisation against measles, and increased focus on retinopathy of prematurity. Also there has been profound advancement in providing spectacles to poor communities, thereby reducing visual impairment caused by uncorrected refractive error (Ackland, 2010).

In terms of the level of visual impairment the number of individuals with moderate and severe visual impairment worldwide decreased from 269 million in 2004 to 246 million in 2010 (Pascolini, 2012; Resnikoff, 2008).In addition, globally it is estimated that there are 17.5 million children aged 0–14 years with moderate and severe visual impairment (Pascolini, 2012).Specifically in South Africa, the prevalence of individuals with moderate and severe visual impairment decreased from 2.3% (660 405 of 47.8 million) in 2005 to 2.0% (662 472 of 50.1 million) in 2010 (The Vision Loss Expert Group,

2016). However, there is a paucity of data available on visual impairment in children and adolescents (aged 0–14 years) in South Africa. Of the global estimate of 1.4 million blind children, 1 million are found in Asia while 300 000 are found in Africa.

2.2 VISUAL IMPAIRMENT AND QUALITY OF LIFE

Visual acuity and quality of life has an inverse relationship with age in Saudi Arabia and the percentage of visual impairment among individuals aged 60 to 70 is 64% (Alshammari *et al.,* 2019).Female and male individuals in the Saudi population have almost the same percentage as regarding visual impairment but females have a lower quality of life when compared to males (Alshammari *et al.,* 2019).Quality of life is increased among married individuals and also married people are more visually impaired than singles in the Saudi population (Alshammari *et al.,* 2019).The leading cause of visual impairment is diabetes and hypertension, with a prevalence of 26.14 in the Saudi population. Patients older than 80 years, women, uneducated, unmarried, and visually impaired were most likely to have a lower quality of life. The importance of eye examinations should be laid in cases where chronic diseases are associated with higher rates of visual complications and poor quality of life (Alshammari *et al.,* 2019).

The main causes of visual impairment in Ibadan, Oyo state Nigeria are cataracts (58.7%), refractive error (19.4%), and glaucoma (2.9%) (Adigun *et al.,* 2014). Visual impairment is associated with advancing age, low education, and unemployment in Ibadan (Adigun *et al.,* 2014). Most patients (85.1%) have good quality of life overall in the Ibadan population but quality of life is poor in the domains of visual function (64.2%) and social interaction (50.9%) (Adigun *et al.,* 2014). Quality of life is related to the degree of visual impairment, that is, blind patients usually have a poorer quality of life (41.4%) when compared with those having low

vision (8.6%) or near normal vision (2.4%,) in Ibadan. There is poor quality of life in patients with a higher degree of visual impairment and there is need for family physicians to identify these visually impaired patients early and make timely referrals (Adigun *et al.,* 2014).

Twenty-nine point three percent (29.3%) of the adult patients in Ghana are visually impaired (presenting vision worse than 6/18) (Amedo *et al.,* 2016).There is a significant difference in the mean age of subjects who are visually impaired (53.7 ± 18.4) (mean ± SD) and subjects who are not visually impaired (34.3 ± 13.1) ($p = 0.001$) in Ghana (Amedo *et al.,* 2016). Visually impaired individuals in Ghana have a lower quality of life scores in all four domains of quality of life naming, environmental, physical, social and psychological with 7.5% unadjusted reduction in overall quality of life (Amedo *et al.,* 2016).Visual impairment is associated with significant reduction in different quality of life domains for the Ghanaian population. Quality of life is poorer with increasing severity of visual impairment in Ghana (Amedo *et al.,* 2016)

The major causes of visual impairment in Imo state, Nigeria are uncorrected refractive error, glaucoma, and cataract (Ejiakor *et al.,* 2019).Glaucoma (6.5%) is the leading cause of blindness in Imo state (Ejiakor *et al.,* 2019).The overall quality of life score is 61.10 ± 19.75, with the lowest mean score being in the environmental domain for the Imo state population. With increasing visual impairment, there is a 19.1% reduction in quality of life. Quality of life is affected by age, duration of visual impairment, and history of poor near vision in Imo (Ejiakor *et al.,* 2019).The leading causes of visual impairment and blindness are avoidable and treatable. Health education, appropriate intervention, and support groups should be encouraged. This may serve to reduce the burden of visual impairment and improve the quality of life of patients.

2.3 THE EFFECTS OF VISUAL IMPAIRMENT

Vision impairment is associated with a reduced quality of life, which is a "complex trait that encompasses vision functioning, symptoms, emotional well-being, social relationships, concerns, and convenience as they are affected by vision" (Lamoureux and Pesudovs, 2011). Numerous studies have shown that vision impairment is often associated with various negative health outcomes and poor quality of life (Chia *et al*., 2006; Langelaan *et al.,* 2007). A recent study using Behavioral Risk Factor Surveillance System (BRFSS) data from 22 states examined unadjusted health-related quality of life among individuals ages 40 to 64 years by visual impairment status and found that the percentage of individuals reporting life dissatisfaction, fair or poor reported health, physical and mental unhealthy days, and days of limited activity increased as the self-reported severity of vision impairment increased (Crews *et al.,* 2016b). An earlier study found similar results among people ages 65 and older (Crews *et al.,* 2014). Based on a variety of measurement instruments, reduced quality of life has been related to the severity of disease in glaucoma, cataract, age-related macular degeneration, and strabismus (Chai *et al.,* 2009; Chatziralli *et al.,* 2012; Cheng *et al.,* 2015; Freedman *et al.,* 2014; Hassell *et al.,* 2006; Orta *et al.,* 2015). Although greater emphasis is traditionally placed on the better-seeing eye's role in visual function, one study concluded that the worse-seeing eye contributes importantly to patients' estimates of vision-related quality of life, particularly when the underlying eye disease affects peripheral vision (e.g., in the case of glaucoma) (Hirneiss, 2014).

2.3.1 Dependence

Loss of vision affects patients' ability to work or care for themselves (or others), and it affects numerous casual activities such as reading, socializing, and pursuing hobbies (Brown *et al.,* 2014). Vision impairment makes it more difficult to perform the basic self-care activities of daily living such as eating and dressing as well as instrumental activities of daily living such as shopping, financial management, medication management, and driving (Brown *et al.,* 2014; Haymes *et al.,* 2002; Whitson *et al.,* 2007, 2014). Most studies have found that vision loss has a greater impact on dependency in instrumental activities of daily living than in basic activities of daily living. The instrumental activities of daily living are critical to one's ability to function in modern society. In particular, the loss of near vision affects one's ability to perform a variety of tasks that involve reading (e.g., getting information from medication labels, balancing bank statements, or following recipes), recognizing faces and images (e.g., socializing, playing cards, using a smartphone), or manipulating small objects (e.g., sewing, replacing batteries). One cross-sectional study found that individuals with visual impairment, defined as a best-corrected binocular presenting visual acuity of 20/30 or worse, had greater disability across functional measures, such as task performance, walking speeds, and driving when compared to people with normal vision and even uncorrected refractive error (Zebardast *et al.,* 2015). Visual field deficits affect one's ability to perform tasks that require ambulation in challenging settings (e.g., moving along crowded city streets, negotiating stairwells) or the use of peripheral vision (e.g driving).

Due to the challenges that vision impairment imposes for independent living, older adults with vision impairment may be more likely to require long-term care. In the Australian Blue Mountains Eye Study, with each line of reduction in presenting visual acuity at baseline, there was a seven percent increased risk of subsequent nursing home placement (Wang *et al.,* 2003).

For participants in the Beaver Dam Eye Study, the odds ratio for nursing home placement was 4.23 (95% confidence interval [CI] = 2.34, 7.64) for low best-corrected visual acuity in the better eye, 5.00 (95% CI = 2.28, 10.94) for poor near vision, and 2.40 (95% CI = 1.46, 3.92) for poor contrast sensitivity, after adjustment for age, sex, self-rated health, and arthritis (Klein *et al.,* 2003).

For persons with vision loss who desire to be a part of the workforce, vision impairment often poses barriers to employment opportunities (O'Day, 1999). Unfortunately, employment statistics pertaining to Americans with vision loss are lacking because available national representative data sources, such as the U.S. Census, group persons with vision impairment with all people who have sensory impairments or with people with sensory or communication impairments (U.S. Census Bureau, 2014).

2.3.2 Mobility and Falls

The primary sense used to navigate three-dimensional space is vision for a person with intact eyesight. Mobility is therefore greatly affected by vision loss, whether resulting from changes in visual acuity, visual fields, depth perception, or contrast sensitivity (Bibby *et al.,* 2007; Lord and Dayhew, 2001; Marron and Bailey, 1982). In the Salisbury Eye Evaluation (SEE) project, vision impairment (defined by visual acuity or visual field deficit) was significantly associated with self-reported difficulty with walking or going up or down steps (Swenor *et al.,* 2013). Also in the SEE project, visual field deficits—but not visual acuity or contrast sensitivity deficits—were predictive of a slower-than-usual gait speed while navigating an obstacle course (Patel *et al.,* 2006). A study from the United Kingdom found that 46 percent of frail elderly indvisual impairment ividuals admitted for hip fracture in two hospital districts had visual impairment,

most frequently untreated cataract (49 percent) and macular degeneration (21 percent), but also uncorrected refractive error (17 percent); the visually impaired hip fracture patients were less likely than those without vision impairment to be under an eye provider's care and more likely to live in areas of social deprivation (Cox *et al.,* 2005). In the Low Vision Rehabilitation Outcomes Study, 16.3 percent of participants referred to vision rehabilitation at 28 U.S. centers indicated that one of their chief vision-related problems was mobility (Brown *et al.,* 2014).

Multiple peer-reviewed studies have documented a relationship between vision impairment and falls (Crews *et al.,* 2016a; Lord, 2006). A 2016 study by Crews and colleagues that used 2014 BRFSS data to analyze the state-specific annual prevalence of falls among persons aged 65 years or older found that 46.7 percent of persons with severe vision impairment (state prevalence range 30.8–59.1 percent) and 27.7 percent of older adults without such impairment (state prevalence range 20.4–32.4 percent) reported having fallen during the previous year (Crews *et al.,* 2016a).Poor contrast sensitivity, reduced depth perception, and visual field loss are visual parameters that have been strongly and consistently associated with falls i(de Boer *et al.,* 2004; Ivers *et al.,* 1998; Klein *et al.,* 2003; Lord and Dayhew, 2001; Lord *et al.,* 1991, 1994; Nevitt *et al.,* 1989). A review of studies that reported the univariate relationship between visual deficits (defined variously) and falls found that the relative risk ratios across studies was 2.5 (CI = 1.6, 3.5) (Rubenstein and Josephson, 2002).

Evidence is limited or conflicting on the need for vision assessment and specific interventions to reduce falls among visually impaired populations. The U.S. Preventive Services Task Force determined that vision correction was among several potential interventions that “lack[ed] sufficient evidence for or against use in prevention of falls in community-dwelling older adults” (Moyer, 2012,Schneider *et al.,* 2012). Unfortunately, the visual deficits most strongly linked to

fall risk (contrast sensitivity, depth perception, and visual field deficits) are generally less amenable to remediation than visual acuity. Other factors such as weakness, other chronic conditions, and the use of medications are also associated with falls, suggesting that successful interventions to reduce falls in visually impaired populations will require a multi-pronged approach (Steinman *et al.,* 2011). Evidence is needed to determine which training aspects, equipment, and environmental modifications are most effective at reducing falls and improving mobility. However, it is the committee's assessment that there remains a role for vision rehabilitation in mitigating fall risk associated with vision loss.

2.3.3 Fractures

Vision impairment has been shown to be associated with an increased risk of fractures in multiple studies. In the Framingham Eye Study, which included a subset of participants from the Framingham Study Cohort, those participants with visual acuity worse than 20/100 were more than twice as likely to have had hip fractures than participants with visual acuity of 20/25 or better (relative risk [RR] = 2.17; 95% CI = 1.24, 3.80) (Felson *et al.,* 1989). In the EPIDOS Prospective Study, among a prospective cohort of 7,575 French women, those with visual acuity of 2/10 (using the decimal Snellen fraction, thus equivalent to 20/100) or worse had a RR of 4.3 (95% CI = 3.1, 6.1) of hip fracture compared to those with visual acuity better than 7/10 (roughly equivalent to 20/30) (RR = 1.0) (Dargent-Molina *et al.,* 1996). Various other aspects of visual impairment besides poor visual acuity have been shown to be associated with an increased fracture risk. In the Study of Osteoporotic Fractures, white women in the lowest quartile of depth perception measures were estimated to have a 40 percent increased risk of fractures compared with women in the other three quartiles (RR = 1.4; 95% CI = 1.0, 1.9), and the risk of fractures increased by 20 percent for each standard deviation decrease in low-frequency contrast

sensitivity (RR = 1.2; 95% CI = 1.0, 1.5) (Cummings *et al.,* 1995). Furthermore, in the same cohort, women with mild, moderate, or severe binocular visual field loss had an increased risk of hip fractures when compared with women without binocular visual field loss, and women with moderate or severe visual field loss had an increased risk of non-hip and non-spine fractures compared with women without binocular visual field loss (Coleman *et al.,* 2009).

Studies have suggested that reversing vision impairment from cataract may be protective against fractures. A randomized controlled trial that evaluated expedited versus routinely scheduled cataract surgery in 306 women found that women with expedited cataract surgery had a 67 percent lower risk of fractures within 1 year after surgery than women with routinely scheduled surgery (RR = 0.33; 95% CI = 0.1, 1.0) (Harwood *et al.,* 2005). A large study of more than 1.1 million men and women with cataract in the national U.S. Medicare database found that compared to patients with cataract who did not undergo surgery, patients with cataract surgery had a 16 percent lower risk of hip fracture (odds ratio [OR] = 0.84; 95% CI = 0.81, 0.87) and a 5 percent lower risk of any fracture (OR = 0.95; 95% CI = 0.93, 0.97). Furthermore, this protective association was modified by the effects of age and systemic disease burden, and the apparent protective relationship between surgery and fracture, based on having a high Charlson Comorbidity Index score, was even stronger among participants who were elderly or ill (Tseng *et al.,* 2012).

The protective association between cataract surgery and fractures may extend beyond a reduction in fracture risk. In a recent study of the same large population of Medicare beneficiaries with cataract, those who had cataract surgery experienced 27 percent decreased risk in long-term mortality compared with those without cataract surgery (hazards ratio [HR] = 0.73; 95% CI = 0.72, 0.74) (Tseng *et al.,* 2016). Similar to what was seen in the study of cataract surgery and

fractures, the protective association between cataract surgery and mortality was modified by the effects of age and systemic disease burden, where patients who were elderly or who had a moderate burden of systemic disease experienced even stronger protective effects than the overall population. Although this study did not examine the mechanisms of the protective effect between cataract surgery and mortality and the study design does not permit conclusions about causation, the reduction in the risk of fractures and accidents was proposed as a contributing factor in the reduced risk of death. The protective association between cataract surgery and mortality in this study was supported by additional data from two earlier studies in the Blue Mountains region, west of Sydney, Australia, both of which demonstrated that patients with vision improvement after cataract surgery had decreased mortality risk compared with patients with vision impairment due to cataract who had not undergone surgery or those with persistent vision impairment after cataract surgery (Fong *et al.,* 2013, 2014).

2.3.4 Subsequent Injury

People with vision loss are at higher risk for several types of injury. Of these, the link between vision loss and fall-related injuries has been most clearly documented. In a population-based cohort of Latinos in California, a greater risk of injurious falls was reported in those with both central vision impairment (OR = 2.76; 95% CI = 1.10, 7.02) and peripheral vision impairment (OR = 1.40; 95% CI = 0.94, 2.05) (Patino *et al*., 2010). A loss of visual field was associated with fall-related fractures, and a relationship between a recently acquired decline in visual acuity and falls with fracture was observed in the Blue Mountain Eye Study (Hong *et al.,* 2014; Klein *et al.,* 2003). Interestingly, both falls and falls with fracture were more likely in participants with a unilateral, rather than bilateral, visual acuity deficit, which is similar to the findings of an earlier study, suggesting that poor depth perception may be a contributor to falls (Felson *et al.,* 1989).

Indeed, poor depth perception has been associated with hip fracture in other epidemiological studies (Cummings *et al.,* 1995). Poor contrast sensitivity is also associated with risk of fall-related fractures (de Boer *et al.,* 2004).

In a prospective study of seniors between the ages of 75 and 80 years, lowered vision4 at baseline was associated with an increased risk of injurious accidents requiring hospitalization over 10 years of follow-up (Kulmala *et al.,* 2008). A visual acuity worse than 0.3 on the Landolt ring chart (roughly equivalent to 20/65) was not associated with a risk of injurious accidents, possibly because persons with more severe visual impairment restricted their activities, resulting in less opportunity for injury. However, in a separate study that used the National Health Interview Survey (NHIS) to follow more than 100,000 adults for up to 7 years, severe bilateral vision impairment was associated with a risk of death due to unintentional injury (HR = 7.4; 95% CI = 3.0, 17.8) (Lee *et al.,* 2003).

2.3.5 Mental Health

Individuals with vision impairment are at a higher risk for anxiety, depression and other psychological problems compared to people with normal vision (Kempen *et al.,* 2012). The rates of depression and anxiety are significantly higher in older adults with vision impairment than individuals of similar ages without vision impairment and those of similar ages suffering from other chronic conditions, such as asthma or chronic bronchitis, heart conditions, and hypertension (Kempen *et al.,* 2012). Distress related to vision loss is more strongly correlated with depression than other key risk factors such as negative life events or poor health status (Rees *et al.,* 2010). Among visually impaired individuals, those with depressive symptoms report more functional limitations. The reasons for the relationship between depression and poor visual

function are unclear and may be bi-directional, but patient-level differences in eye disease and general medical condition did not account for the observed relationship (Rovner and Casten, 2002; Rovner *et al.,* 2006). One randomized, controlled trial of an integrated mental health and vision rehabilitation program (compared with vision rehabilitation with non-directed supportive therapy) for patients with macular degeneration and subsyndromal depressive symptoms found significantly reduced rates of depression symptoms and better functional outcomes in the intervention group (Rovner *et al.,* 2014). This work suggests that some of the functional and affective consequences of vision loss are remediable.

2.3.6 Mortality

Several studies report associations between vision impairment and an increased risk for all-cause and injury-related mortality, as compared to controls with normal vision (Christ *et al.,* 2014; Lam *et al.,* 2008; Lee *et al.,* 2002, 2003; Zheng *et al.,* 2014).The elevated risk of accidents and falls may be one of the possible cause of the greater mortality in visually impaired people. In the longitudinal study by Christ and colleagues (2014), the relationship between worse visual acuity and mortality was mediated by disability in instrumental activities of daily living, which suggests that some deaths may result from an impaired ability for self-care and disease management.

Medical conditions (e.g., diabetes, obesity, autoimmune disorders, hypertension), lifestyle factors (e.g., smoking, alcohol use), and socio-demographic factors (e.g., race, age, socioeconomic disadvantage) certainly confounds the relationship between vision impairment and mortality. In monitoring and reducing the overall public health burden of vision loss, the complicated interplay between eye health and other medical comorbidities is an important factor.

2.4 REHABILITATION OF THE VISUAL IMPAIRED

Many ocular pathologies and diseases of the visual pathways still cause persistent visual deficits that make everyday life more difficult in many ways despite therapeutic progress. The major aim of rehabilitation is to compensate for these limitations by optimizing residual vision. In the near future the demand for visual rehabilitation will increase markedly (Susanne 2011)

The magnitude of vision loss is not determined solely by the functional ability of an individual with visual impairment. In addition to the physiology of the eye, other physical, psychological and social factors also influence daily living. More symptoms of depression is experienced by individuals with visual impairment than those without visual impairment (Binns 2011).The combination of social, functional and psychological disabilities related to visual impairment result in an overall reduction in quality of life (Binns 2011). As a result, rehabilitation of an individual with visual impairment requires a holistic approach that considers social, economic and psychological needs in addition to their visual needs (Oduntan, 2008).An ideal interdisciplinary team of health care professionals that can provide such an approach would include, among others, an optometrist, ophthalmologist, psychologist, audiologist, occupational therapist, orientation and mobility instructor and physiotherapist (Oduntan 2008).

The same quality of life as that of normally sighted individuals can be achieved if there is proper management of individuals with visual impairmen (Kavitha *et al.,* 2015).The availability, accessibility and affordability of rehabilitation services are particularly important in developing countries. Early intervention is key in providing effective visual rehabilitation and is vital in reducing the incidence and impact of visual impairment. As regarding the access of rehabilitation

for individuals with visual impairment, there is significant gender differences. Even though more women are blind or have visual impairment, only a minority seek rehabilitation and/or low vision services (Uprety *et al.,* 2016).This makes certain the need for vision screening and awareness programmes targeting women, more especially in developing areas.

CHAPTER THREE

METHODS

3.1 STUDY DESIGN

The study was carried out as an institution based descriptive cross-sectional study.

3.2 STUDY AREA

The University of Benin Teaching Hospital is situated along the Benin Lagos Highway, it shares a boundary with the main campus of the University of Benin, its other boundary is the Federal Girls Government College Road, Benin City.

The hospital has various specialty departments and its an healthcare service provider in West Africa. It was established on May 12, 1973 following the enactment of an edict (number 12) of the Nigeria National Health Act. Its located in Ovia North-East local government area of Edo State, Nigeria.

3.3 SAMPLING TECHNIQUE

This study will utilize a convenient random sampling method to collect the data given the willingness of the patients to participate in the research.

3.4 STUDY POPULATION

The study population was made up of both old and new visually impaired adult patients aged 18 years and older that were visiting the ophthalmic complex at the University of Benin Teaching Hospital and gave their consent for participating in the study.

3.5 SAMPLE SIZE DETERMINANT

The sample size for this study was determined using the Fischer's formula.

N= Z*2[pq]/d*2

Where;

N = Minimum sample size.

Z = The standard normal deviate, usually set at 1.96 corresponding to 95% confidence interval.

p = Assumed prevalence taken from the estimated prevalence of visual impairment which is 6.27% (0.0627).

q = 1.0 − p (1.0 − 0.0627) = 0.9373.

d = Precision level acceptable = 5% (0.05).

$$N = \frac{1.96 \text{ X } 1.96 [0.0627 \text{ x } 0.9373]}{0.05 \text{ X } 0.05}$$

$$N = \frac{3.8416 [0.05876871]}{0.0025}$$

$$N = \frac{0.2257}{0.0025}$$

N= 97

This gave a minimum sample size of approximately 97.Adapted from The Impact of visual impairment and blindness on quality of life of patients in Owerri, Imo state (Ejiakor *et al*). However, a sample size of 150 was used in this study.

3.6 STUDY DURATION

This study was conducted within a period of one month (August to September 2023).

3.7 RESEARCH MATERIALS

LVQOL-Low Vision Quality of Life questionnaire

3.8.1 INCLUSION CRITERIA

- Individuals above 18 years of age
- Individuals without hearing difficulties.
- Individuals who are willing to participate in the study or provide informed consent.
- Individuals not suffering from disorders affecting cognitive functions

3.8.2 EXCLUSION CRITERIA

- Individuals below 18 years of age
- Individuals with hearing difficulties.
- Individuals who are not willing to participate in the study or provide informed consent.
- Individuals suffering from disorders that can affect cognitive functions

3.9 ETHICAL CONSIDERATION

- Ethical approval to conduct this study was obtained from the Research and Ethics Committee of the Department of Optometry, University of Benin, Benin City.Ethical

approval was also obtained from the hospital administration of the University of Benin Teaching Hospital, Benin City were the study was carried out.

- This study was done in accordance with the tenets of the Declaration of Helsinki.
- Informed consent was sought from the participants and consenting participants participated in the study.

3.10 PROCEDURE

The population for this study was selected through a purposive sampling technique from visually impaired patients that attended the outpatient clinic at the University of Benin Teaching Hospital, Benin City. Subjects who did not meet the inclusion criteria were excluded from the study. Information as pertaining to age, sex, VA, history of VI, and history of chronic disea**ses** particularly diabetes mellitus, hypertension, cataract, and glaucoma were obtained from the patient's case record note.

Data about quality of life was collected manually using the Low Vision Quality of Life Questionnaire (LVQOL). The questionnaire has a total of 25 questions and is divided into four sections, which are distance vision, mobility and lighting, adjustment, reading and fine work, and activities of daily living. The participants read a brief description about vision impairment. The participants chose the best answer that described their lives by marking one of the five answers. A final score out of 125 was obtained from the answers of the participants, which reflected the quality of life. In this study a two-point scale was used; a quality of life score of 0-65 represented poor quality of life while a quality of life score above 65 that is 65-125 were good quality of life scores. A section at the beginning of the questionnaire was added to obtain the demographics of the participants, which are age, gender, level of education, and marital status. As some of these

information might not have been found nor updated in some of the patient's medical records. Education was divided into four groups: the first group including bachelor's degree graduates or above, the second; people with a high-school degree, the third group; middle and elementary school education, and the fourth group for those who did not receive any level of education, since different levels of education can lead to different results. The data from these variables were analyzed.

3.11 DATA ANALYSIS

The data obtained from this study was analyzed using the statistical package for social sciences (SPSS) version 22.0. Descriptive statistics (mean, standard deviation, frequency, and percentage) was used to describe the quantitative and categorical variables. A regression analysis was carried out to estimate the relationship between the dependent variables, i.e., the Quality of Life and degree of vision impairment, and one or more independent variables from the following: gender, age, education level, marital status, diabetes mellitus, hypertension, glaucoma, and cataract. The analysis helped to determine the relationships between these variables.

CHAPTER FOUR

4.0 RESULTS

INFORMATION ON DEMOGRAPHIC VARIABLES

A total number of a hundred and fifty adults (150) comprising of 85 males and 65 females participated in the study. The mean age of participants was 55.88 ± 11.33 , the mean age of male participants was 57.77 ± 12.73 while the mean age of female participants was 57.33 ± 11.24.From the hundred and fifty participants, nine(9) of the participants were in the age range of 18-19 years, Twenty(20) of the participants were in the age range of 29-39 years, Twenty-nine(29) of the participants were in the age range of 39-49 years, Twenty-two were in the age range of 49-59 years, Thirty-five of the participants were in the age range of 59-69 years. Thirty-two of the participants were in the age range of 69-79 years, while only three of the participants were in the age range of 79-89 years. Participants aged in the class interval of 59-69 years participated more in the study while those aged 79-89 years had the least participants. This information is shown in the table below (Table 4.1)

Table 4.1: The Age Distribution of the Participants' is shown in the table below

Age	No Of Participants	Mean Age	Percentage
18-29	9	24.66	6%
29-39	20	32.80	13.33%
39-49	29	41.68	19.33%
49-59	22	55.00	14.66%
59-69	35	58.80	23.33%
69-79	32	77.25	21.33%
79-89	3	85.34	2%
Total	150	375.53	100%

More males participated in the study than females with a total number of 85 males as compared to 65 females with a mean age of 55.77 ± 12.73 for males and 57.33 ± 11.24 respectively as shown in Table 4.2 below

Table 4.2: Frequency Distribution of Gender is shown in the table below

Gender	**Frequency**	**Mean age**	**Percentage**	**Standard deviation**
Male	85	55.77	56.66%	12.73
Female	65	57..33	43.33%	11.24
Total	150	113.1	100%	23.97

Individuals who were uneducated participated least in this study with a total number of just fifteen (15) participants while individuals who were able to attend college participated the most with a total number of sixty (60) participants. Fifty of the participants went to elementary and middle school as the highest level of education they could attain while twenty-five of the participants attended high school as their highest level of education.

Table 4.3: Level of education distribution is shown in the table below

Level of education	**frequency**	**percentage**
Uneducated	15	10%
Elementary and Mid	50	13.33%
High	25	16.66%
College	60	40%
Total	150	100%

A total number of 129 individuals who participated in the study were married as at the time data was collected while 21 of the participants were unmarred as shown in table 4.4 below.

Table 4.4: Frequency Distribution of Marital status is shown in the table below

Marital status	**Frequency**	**Percentage**
Married	129	86%
Unmarried	21	14%
Total	150	100%

Using the average quality of life score of 65 as a deciding criteria, it was discovered that 47 of the participants' have good quality of life as compared to 102 respondents who have poor quality of life. The table below shows the quality of life of the different class intervals,

Table 4.5: Age Distribution and Quality of life is shown in the table below

	QUALITY OF LIFE		
Age	**Good (≥ 65)**	**Poor (< 65)**	**Mean ± SD**
19 - 29	3	11	24.66 ± 2.26
29 – 39	5	13	32.80 ± 2.51
39 – 49	9	16	41.68 ± 2.98
49 – 59	10	15	55.00 ± 3.10
59 – 69	7	25	65.80 ± 2.60
69 – 79	12	18	77.25 ± 2.40
79 - 89	1	4	85.34 ± 3.22
TOTAL	**47**	**102**	

A total number of one hundred and fifty Low Vision Quality of Life questionnaires where used for collecting data. The questionnaire has a total number of 25 questions, with each question having a maximum score of 5 and a minimum of 0.The LVQOL is scored 0 (least attainable score) to 125 (the highest attainable score); representating the worst quality of life value to the best quality of life). In this study a two-point scale was used; a quality of life score of 0-65 represented poor quality of life while a quality of life score above 65 that is 65-125 were good quality of life scores.

Table 4.6.1: Participants distance vision, mobility and lighting grading is shown in the table below

S/N	Questions	Greatly	Moderately			None		
How much of a problem do you have		**5**	**4**	**3**	**2**	**1**	**Mean**	**S.Dev**
1	With your vision in general	40 26.67%	64 42.7%	7 4.67%	20 13.33%	18 12%	2.14	.471
2	With your eyes getting tired (e.g only being able to do a task for a short period of time)	66 44%	45 30%	5 3.33%	14 9.33%	20 13.33%	2.36	.835
3	With your vision at night inside the house	38 25.33%	75 50%	12 8%	15 10%	10 6.67%	3.16	.498
4	Getting the right amount of light to be able to see	61 40.66%	50 33.33%	5 3.33%	24 16%	10 6.67%	2.89	.679
5	With glare (e.g dazzling by car lights or the sun)	72 48%	48 32%	7 4.67%	18 12%	20 13.33%	2.93	1.02
6	Seeing street signs	40 26.67%	64 42.7%	7 4.67%	20 13.33%	18 12%	3.06	.729
7	Seeing the television (Appreciating the pictures)	56 37.33%	69 46.5%	15 10%	2 1.33%	8 5.33	2.92	.778
8	Seeing moving objects (e.g cars on the road)	48 32%	72 28%	7 4.67%	18 12%	20 13.33%	2.99	.842
9	With judging the debt or distance of items (e.g reaching for a glass)	40 26.67%	50 33.3%	8 5.33%	30 20%	22 14.67%	2.87	.919
10	Seeing steps or curbs	45 30%	58 38.8%	19 12.67	16 10.67	10 6.67%	2.90	0.59
11	Getting a round outdoors (e.g. on uneven pavements) because of your vision	61 40.66%	50 33.3%	5 3.33%	24 16%	10 6.67%	3.05	.901

12	Crossing a road with traffic because of your vision	61 40.66%	50 33.33%	5 3.33%	24 16%	10 6.67%	2.85	.902

From the table above, the analysis of Question 1 shows that 40 (26.67%) of the participants have great problem with their vision in general, 64 (42.7%), 7 (4.67%) and 20 (13.33%) have quite a problem with their vision in general. However, 18 (12%) of the participants did not have any problem with their vision in general.

Question 2 shows that 66 (44%) of the participants have problem with their eyes getting tired (e.g only being able to do a task for a short period of time). 45 (30%), 5 (3.33%) and 14 (9.33%) the participants have moderate problem with their eyes getting tired (e.g only being able to do a task for a short period of time). However, 5 (3.33%) the participants do not have problem with their eyes getting tired (e.g only being able to do a task for a short period of time)

Question 3 shows that 38 (25.33%) of the participants have great problem with their vision at night inside the house. 75 (50%), 12 (8%) and 15 (10%) of the participants have moderate problem with their vision at night inside the house. Also, 10 (6.67%) of the participants do not have problem with their vision at night inside the house.

Question 4 which shows that 61 (40.66%) of the participants have great problems with getting the right amount of light to be able to see. 50 (33.33%), 5 (3.33%) and 24 (16%) of the participants have moderate problems with getting the right amount of light to be able to see. 10 (6.67%) of the participants do not have any problems with getting the right amount of light to be able to see

Question 5 shows that 48 (32%) of the participants have great problems With glare (e.g dazzling by car lights or the sun). 72 (48%), 5 (5%) and 18 (12%) of the participants have moderate

problem with glare (e.g dazzling by car lights or the sun), with 20 (13.33%) of the participants having no problems at all with glare.

Question 6 shows that 40 (26.67%) of the participants have great problems seeing street signs. 64 (42.7%), 7 (4.67%) and 20 (13.33%) of the participants have moderate problems seeing street signs. 18 (12%) of the participants do not have problems seeing street signs

Question 7 shows that 56 (37.33%) of the participants have great problems seeing the television (Appreciating the pictures). 69 (46.5%), 15 (10%) and (1.33%) of the participants have quite a problems seeing the television. 8 (5.33) of the participants don't have any great problems seeing the television

Question eight shows that 36 (48 (32%) of the participants have great problems seeing moving objects (e.g cars on the road), 72 (28%), 7 (4.67%) and 18 (12%) of the participants have moderate problems seeing moving objects (e.g cars on the road). 20 (13.33%) of the participants do not have any problems seeing moving objects (e.g cars on the road)

Question 9 shows that 40 (26.67%) of the participants have great problems with judging the debt or distance of items (e.g reaching for a glass). 50 (33.33%), 8 (5.33%) and 30 (20%) of the participants have moderate problems with judging the debt or distance of items (e.g reaching for a glass). 22 (14.67%) of the participants have no problems with judging the debt or distance of items (e.g reaching for a glass)

Question 10 shows that 45 (30%) of the participants have great problems seeing steps or curbs. 58 (38.67%), 19 (12.67%) and 16 (10.67%) of the respondents have moderate problems seeing steps or curbs. 10 (6.67%) of the respondents have no problems seeing steps or curbs

Question 11 shows that 61 (40.66%) of the participants have great problems getting a round outdoors (e.g. on uneven pavements) because of their vision. 50 (33.33%), 5 (3.33%) and 24 (16%) of the participants have moderate problems getting a round outdoors (e.g. on uneven pavements) because of their vision. 10 (6.67%) of the participants have no problems getting a round outdoors (e.g. on uneven pavements) because of their vision

S/N	Questions	Greatly	Moderately			None		
		5	4	**3**	2	1	**Mean**	**S.Dev**
Adjustment because of your vision, are you								
13	Unhappy at your situation in life	40 26.67%	50 33.33%	8 5.33%	30 20%	22 14.67 %	2.70	.873
14	frustrated at not being able to do certain tasks	19 12.67	45 30%	58 38.67%	16 10.67	10 6.67%	2.87	.801
15	Restricted in visiting friends and family	15 10%	2 1.33%	8 5.33	69 46.5%	56 37.33 %	3.01	.910

Question 13 shows that 40 (26.67%) of the participants are greatly unhappy at their situation in life. 50 (33.33%), 8 (5.33%) and 30 (20%) of the participants are quite unhappy at their situation in life. 22 (14.67%) of the participants are okay with their situation in life

Question 14 shows that 19 (12.67%) of the participants are greatly frustrated at not being able to do certain tasks. 45 (30%), 58 (38.67%) and 16 10.67%) of the are quite frustrated at not being able to do certain tasks. 10 (6.67%) of the participants have are not even frustrated at not being able to do certain tasks

Question 15 shows that 15 (10%) of the participants are greatly restricted in visiting friends and family. 2 (1.33%), 8 (5.33%) and 69 (46.5%) of the participants are quite restricted in visiting

friends and family. 56 (37.33%) of the participants are in no way restricted in visiting friends and family.

Table 4.6.2: Participants' Knowledge with their eye condition is shown in the table below

S/N	Questions	Well	Moderately			Poorly		
		5	4	**3**	2	1	**Mean**	**S.Dev**
16	How well has your eye condition been explained to you	70 46.5%	57 37.33 %	14 10%	3 1.33%	8 5.33	2.89	.804

Question 15 shows that 70 (46.5%) of the participants have their eye condition well explained to them. 57 (37.33%), 3 (1.33%), and 14 (10%) of the participants have their eye condition moderately explained to them. 8 (5.33%) of the participants have their eye condition poorly explained to them.

Table 4.6.3: participants situation in reading and fine work is shown in the table below

S/N	ITEM	Greatly	Moderately			None		
		5	4	**3**	2	1	**Mean**	**S.Dev**
With your reading aids/ glasses, if used, how much of a problem do you have:								
17	reading large print (e.g. newspaper headlines)	5 3.33%	10 6.67%	24 16%	61 40.66%	50 33.33%	2.51	.550
18	Reading newspaper text and books	18 12%	20 13.33%	7 4.67%	72 48%	48 32%	3.01	.678
19	Reading labels (e.g. on medicine bottles)	7 4.67%	18 12%	20 13.33 %	40 26.67%	64 42.7%	2.90	.719
20	Reading your letters and mails	2 1.33%	8 5.33	15 10%	56 37.33%	69 46.5%	2.79	.862
21	Having problems using tools (e.g. threading a needle or cutting)	48 32%	72 28%	7 4.67%	18 12%	20 13.33%	2.90	.729

Question 17 shows that 5 (3.33%) of the participants have great problems reading large print (e.g. newspaper headlines). 10 (6.67%), 24 (16%) and 61 (40.66%) of the participants have moderate problems reading large print (e.g. newspaper headlines). 50 (33.33%) of the participants do not have any problems reading large print (e.g. newspaper headlines)

Question 18 shows that 7 (4.67) of the participants have great problems reading newspaper text and books. 20 (13.33%), 18 (12%) and 48 (32%) of the participants have moderate problem with glare (e.g dazzling by car lights or the sun reading newspaper text and books, with 72 (48%) of the participants having no problems reading newspaper text and books.

Question 19 shows that 20 (13.33%) of the participants have great problems reading labels (e.g. on medicine bottles). 18 (12%), 7 (4.67%) and 40 (26.67%) of the participants have moderate problems reading labels (e.g. on medicine bottles). 64 (42.7%)of the participants do not have problems reading labels (e.g. on medicine bottles)

Question 20 shows that 2 (1.33%) of the participants have great problems reading letters and mails. 8 (5.33), 15 (10%) and 56 (37.33%) of the participants have quite a problems reading letters and mails. 69 (46.5%) of the participants don't have any great problems reading letters and mails

Question 21 shows that 36 (48 (32%) of the participants have great problems having problems using tools (e.g. threading a needle or cutting), 72 (28%), 7 (4.67%) and 18 (12%) of the participants have moderate problems having problems using tools (e.g. threading a needle or cutting). 20 (13.33%) of the participants do not have any problems having problems using tools (e.g. threading a needle or cutting).

Table 4.6.4: Participants' activities of daily living is shown in the table below.

S/N	Questions	Greatly	Moderately			None		
		5	4	3	2	1	**Mean**	**S.Dev**
With your reading aids/ glasses, if used, how much of a problem do you have:								
22	Finding out the time for yourself	0 0%	0 0%	0 0%	0 0%	150 100%	3.10	.930
23	Writing (e.g. cheques or cards)	0 0%	0 0%	0 0%	0 0%	150 010%	2.98	.900
24	Reading your own hand writing	0 0%	0 0%	0 0%	10 6.7%	140 93.3%	3.15	1.01
25	With your everyday activities (e.g. house-hold chores)	0 0%	0 0%	0 0%	0 0%	150 100%	3.05	.988

Question 22 shows that none of the participants have difficulty in finding out time for themselves. Question 23 shows that none of the participants have difficulty in writing (e.g. cheques or cards) but rather are able to write cheques or cards.

Question 24 shows that 10 (6.7%) of the participants have very little problem reading their own hand writing, while 140 (93.3%) %) of the participants do not have any problem reading their own hand writing. Question 25 shows that none of the participants have difficulty with their everyday activities (e.g. house-hold chores).

ANALYSIS OF DEMOGRAPHIC VARIABLES AND QUALITY OF LIFE

Quality of life was reduced with older age, female gender, lower level of education, being unmarried, and vision impairment. Each of these associations was tested for significance using the chi-square test. Education, gender, and age showed significance, and the p-values for these variables were 0.016, 0.030, and 0.036, respectively. The degree of vision impairment showed significance with a p-values < 0.05 for educational level, marital status, gender except for age which showed a non-significance having a p-value > 0.05 (5%). Quality of life showed significance with a p-values of < 0.05 (5%) for educational level, marital status and gender except for age which shows a non-significance with a p-value > 0.05 (5%) (Table 4.6). The degree of vision impairment had also been analyzed to determine if it was affected by any of the study variables, and it showed significance with gender, marital status and educational status ($p < 0.05$). Males had more prevalence of vision impairment (64%) associated with reduced quality of life (71%).

Table 4.7: Characteristics of the participants versus VA and quality of life is shown in the table below.

Variables	Participants N=150	Visual Acuity		P-Value	Participants N=150	Quality of Life		P-Value
		Normal	Impaired			Good	Poor	
AGE								
19 - 29	9	2 (22%)	9 (78%)		9	3 (21%)	11 (79%)	
29 – 39	20	7 (35%)	13 (65%)		20	5 (28%)	13 (72%)	
39 – 49	29	10 (34%)	19 (66%)		29	9 (35%)	16 (65%)	
49 – 59	22	5 (38%)	17 (62%)	**0.18**	22	10 (40%)	15 (60%)	**0.0136**
59 – 69	35	15 (43%)	20 (57%)		35	7 (22%)	25 (78%)	
69 – 79	32	15 (47%)	17 (53%)		32	12 (40%)	18 (60%)	
79 - 89	3	0 (0%)	3 (100%)		3	1 (20%)	4 (60%)	
GENDER								
Male	85	31 (36%)	49 (64%)	**0.033**	85	25 (29%)	60 (71%)	**0.0001**
Female	65	15 (23%)	50 (77%)		65	21 (32%)	45 (68%)	
EDUCATIONAL LEVEL								
Uneducated	15	4 (27%)	11 (73%)		15	10 (40%)	15 (60%)	
Elementary and middle	50	19 (38%)	31 (62%)	**0.020**	50	22 (40%)	28 (60%)	**0.0001**
High	25	9 (36%)	16 (64%)		25	12 (40%)	18 (60%)	
College	60	22 (37%)	38 (63%)		60	17 (57%)	38 (63%)	
MARITAL STATUS								
Married	129	51 (40%)	78 (60%)	**0.189**	129	39 (41%)	57 (59%)	**0.213**
Unmarried	21	6 (29%)	15 (71%)		21	20 (37%)	34 (63%)	

For the 150 participants who were interviewed using the Low Vision Quality of Life questionnaire, the prevalence of vision impairment among them was 18% having diabetes mellitus, while 8% having hypertension. The prevalence of both hypertension and diabetes in the study participants was 3%. The percentages of those who did not have either glaucoma or cataract were 49% and 71%, respectively. The rest of the chronic diseases data are shown in Table 2.

Table 4.8: Chronic diseases and visual acuity (N= 150).

Variables	Participants N=150	Visual Acuity		P-Value	Participants N=150	Quality of Life		P-Value
		Normal	Impaired			Good	Poor	
Diabetes mellitus								
YES	22	12 (44%)	15 (56%)	**0.364**	22	1 (21%)	4 (79%)	**0.73**
NO	128	46 (37%)	77 (63%)		128	56 (39%)	89 (61%)	
Hypertension								
YES	12	2 (17%)	10 (83%)	**0.312**	12	2 (25%)	6 (75%)	**0.76**
NO	138	40 (29%)	98 (71%)		138	43 (30%)	99 (60%)	
Both (diabetes mellitus and hypertension)								
YES	5	2 (40%)	3 (40%)	**0.256**	5	20 (42%)	28 (58%)	**0.16**
NO	145	56 (39%)	89 (61%)		145	41 (40%)	61 (60%)	
Glaucoma								
YES	67	16 (24%)	51 (76%)	**0.045**	67	20 (37%)	34 (63%)	**0.37**
NO	83	23 (32%)	50 (68%)		83	39 (41%)	57 (59%)	
Cataract								
YES	44	19 (43%)	25 (57%)	**0.354**	44	23 (32%)	50 (68%)	**0.29**

NO	106	40 (37%)	66 (63%)		106	16 (24%)	51 (76%)	

Table 4.9: Degree of visual acuity and quality of life is shown in the table below (N = 150).

Degree of Vision Impairment	**Participants (%)**	**Quality of life (%)**	
		Poor	**Good**
Normal	65 (43%)	21 (32%)	45 (68%)
Impaired	85 (57%)	25 (29%)	60 (71%)
TOTAL	150 (100)	46 (31)	105 (69)

The regression test (Table 4.10) was conducted with the variables that showed significance in reducing the quality of life and degree of vision impairment to observe which variable had the most impact on both domains. Gender showed a significant impact on reducing both quality of life and the degree of vision impairment; according to the findings mentioned previously, the female gender was associated with more reduced quality of life and degree of vision impairment. When it comes to the quality of life alone, education had the lowest effect on quality of life.

Table 4.10: Regression Test.

DEGREE OF VISION IMPAIRMENT						
	B	S.E	Wald	df	Sig.	Exp (B)
Age	0.233	0.133	2.36	1	0.03	.471
Gender	0.342	0.552	3.16	1	0.013	.835
Uneducated	0.160	0.125	2.89	1	0.067	.498
Elementary and middle	0.011	0.231	2.93	1	0.018	.679
Higher Education	0.012	0.340	3.06	2	0.035	1.02
College	0.049	0.153	2.92	1	0.049	.729
Constant	0.021	0.301	2.99	1	0.040	0.543
QUALITY OF LIFE						
Age	0.021	0.346	2.513	1	0.037	.778
Gender	0.121	0.183	3.015	1	0.018	.842
Uneducated	0.158	0.240	2.921	1	0.035	.919
Elementary and middle	0.024	0.273	2.790	1	0.047	0.59
High	0.030	0.176	2.901	2	0.060	.901
College	0.154	0.433	2.510	1	0.011	.902
Constant	0.012	0.063	2.780	1	0.052	.778

Majority of the participants have moderate problems with their vision both for those that have normal vision and impaired vision 35 (78%) and 73 (70%) respectively. While those who said that they have no problems as regards to the state of their vision were very low as compared to those that have severe problems and moderate problems. This is shown in the table below on the Participants' perception of vision impairment

Table 4.11: Subjective versus objective visual assessment (N=150).

Participants' perception of vision impairment **(%)**				
Degree of VA	**Severe problem**	**Moderate Problem**	**No problem**	**Total**
Normal Vision	4 (9%)	35 (78%)	6 (13%)	45
Impaired Vision	25 (24%)	73 (70%)	7 (7%)	105

Table 4.12: Self-perception of satisfaction with life compared with the QOL score is shown in the table below (N=150).

Quality of life score (%)			
Participants' perception of Life	**Good**	**Poor**	**Total**
Severe problem	8 (11%)	65 (89%)	75
Moderate Problem	25 (12%)	179 (88%)	204
No problem at all	20 (56%)	16 (44%)	36

CHAPTER FIVE

5.0 DISCUSSION

Despite the fact that vision impairment is common among older age groups, it is not primarily characterized by a lower quality of life. Reflecting upon previous articles on the association of vision impairment with demographic factors (age, gender, education, and marital state), activity limitations, diseases (diabetes mellitus, Glaucoma, Cataract, and hypertension), and social measures, each of these factors was examined to explain the lower quality of life among visually impaired elderly patients.

When comparing the demographic variables that may affect vision impairment to previous studies by Amedo *et al.,* (2016), the present results suggest that age showed no significant association with vision impairment, perhaps due to the small sample size. However, a recent study conducted by Alshammari *et al.,* (2020) in King Khalid University Hospital outpatient was consistent with the global trend of the increasing prevalence of vision impairment in older individuals. It stated that there was a high prevalence of vision impairment (26%) among adults aged 60 years and older. This was further supported by a study undertaken by Pascolini (2010) analyzing the Global estimates of visual impairment, showed that vision impairment increases with age. Gender demographics suggested a statistically higher significant prevalence of vision impairment 58% among males and 42% among females. In comparison with a previous study by Ekpenyong and Ndukwe (2010) showed that blindness and cataract were more among women for all categories of vision impairment. Furthermore, more females than males were visually impaired in Nigeria. Education showed no statistically significant effect on vision impairment. On the Other hand, a previous study conducted by Bekibele and Gureje (2008) found that women

without education and a stable source of income had shown to have less decision-making capacity related to the use of eye care services compared to men. Marital status, likewise, portrayed a statistically insignificant effect on vision impairment.

In the present study, the quality of life was compared between the two genders and found that females had a lower degree of vision in comparison to males. Equivalently, A study in Malaysia found that gender significantly contributed to vision impairment. Older women reported higher levels of visual problems than men. On the other hand, no statistically significant difference was observed between females and males, according to a study conducted in Spain.

Besides, the participants in the present study indicated the association between quality of life with education level that those with lower levels of education showed more reduced quality of life, but no association was found with the degree of vision impairment. Similarly, a study conducted by Nutheti *et al.,* (2006) showed that people with vision impairment were less educated than those with no vision impairment. Among the married elderly people, it was found that marital status did not have a significant impact on the quality of life. Married elderly people were found to have significantly higher scores of quality of life and all its domains. However, widowed individuals obtained lower scores than married or unmarried individuals.

This study discovered that there is a notable reduction in the quality of life for patients with diabetes mellitus (60%); however, a study conducted by Nutheti *et al*., (2006) showed that patients with type diabetes mellitus had moderate QoL that decreased with other comorbidities. They stated that in high income countries and in Eastern and Central Europe, there is a notable decrease in moderate and severe vision loss due to eye complications from diabetes. Bekibele and Gureje (2008) pointed out that diabetic retinopathy comes in fifth place as a cause of virtual

impairment, followed by uncorrected refractive error, cataracts, macular degeneration, and glaucoma. This highlights the importance of vision test requirements in primary clinics for the elderly on the basis that the majority of the present sample had visual impairment combined with diabetes mellitus. Wang *et al.,* (2014) stated that hypertension could cause multiple eye damages, including retinal artery macro aneurysm, where rupture can result in chronic exudation and macular edema with persistent poor vision. This supported the present findings where the patients with hypertension and impaired vision represented 40%.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 SUMMARY OF FINDINGS

This study investigated the effects of visual impairment on the quality of life of adult patients in the University of Benin Teaching Hospital, Benin City. Two (2) objectives were raised for the study which are: to evaluate the causes of visual impairment; and to evaluate effects of visual impairment on the quality of life. The study adopted survey research design. The instrument for data collection was Low Vision Quality of Life questionnaire (LVQOL); it was built around the research question and validated by the researcher's supervisor. Data collected were analysed using descriptive statistics by means of frequency count and simple percentage. Anova was used to check for the significance of the moderating variables. The following is a summary of the findings from the empirical analysis of the study:

Age has a significant effect on the vision and eventually the quality of life of adult patients. The older the respondents, the more likely to have vision impairment and consequently a reduction in the quality of life.

Marital status does not have any significant effect on vision impairment that eventually leads to a reduction of the quality of life of a patient in Benin City.

The educational level does not have any significant effect on vision impairment that eventually leads to the quality of life of patients in Benin City.An individuais quality of life is not affected by their educational qualification.

Gender or sex does not have any impact on vision impairment and the quality of life of patients in Benin City. Hence, vision impairments is independent the sex of a person

6.2 CONCLUSION

Based on the findings of the study, it was concluded that visual impairment is regular anomaly that affects many person in Nigeria and across the world at large where persons are unable to use their eye sight functionally and maximally due to the malfunction of the eye. Based on certain factors analysed to check their influence on vision impartment and quality of life of patients in University of Benin Teaching Hospital outpatient clinics, age had significant effect on the vision and eventually the quality of life of respondents, hence, the older people get, the more likely they are to have vision impairment and consequently a reduction in the quality of life. The marital status of patients does not have any significant effect on their vision or their quality of life. The educational level of patents also does not have any significant effect on the vision and the quality of life which shows that vision impairment is not based on educational qualification. Also, gender or sex does not affect the vision and the quality of life of patients. Hence, vision impairments is independent the sex of a person in the University of Benin Teaching Hospital.

6.3 RECOMMENDATIONS

Based on the findings and conclusion of the study, the following recommendations were made:

1. Government should ensure that regular sensitization is given to the public on the causes of visual impairment so that they can safeguard their eyes.
2. Government should ensure that the cost of rehabilitation services are subsidized for the public so that these glasses can be purchased at a reduced and affordable price.

3. The public should ensure that they go for regular eye checkups to ascertain the state of their eyes.

6.4 SUGGESTION FOR FURTHER STUDIES

More research can be done on:

1. The effect of visual impairment on the academic performance of University of Benin students.
2. The effect of visual impairment on the quality of life of children in Benin City

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APPENDIX

Patient Name: _____DOB: _____

Date of Visit:_____

Patient Demographic Questionnaire

Please answer the following questions

A. Age

How old are you?

19-29

29-39

39-49

49-59

59-69

69-79

89-90

B. Gender

Male

Female

C. Education

Uneducated

Elementary and middle

High

College

D. Marital Status

Married

Unmarried

Brief:

Visual impairment is a term experts use to describe any kind of vision loss, whether it's someone who cannot see at all or someone who has partial vision loss. Some people are completely blind, but many others have what's called legal blindness.

Because of your vision, how much difficulty do you have with the following activities? Check the box that best describes how much difficulty you have, even with glasses. If you do not perform the activity for reasons unrelated to your vision, circle “n/a” activity.

THE LOW QUALITY-OF-LIFE QUESTIONNAIRE (LVQOL) ENGLISH VERSION

Distance Vison, Mobility and Lighting GRADING

How much of a problem do you have	**None**	**Moderately**			**Great**		
With your vision in general	5	4	3	2	1	x	n/a
With your eyes getting tired(e.g only being able to do a task for a short period of time)	5	4	3	2	1	x	n/a
With your vision at night inside the house	5	4	3	2	1	x	n/a
Getting the right amount of light to be able to see	5	4	3	2	1	x	n/a
With glare (e.g dazzling by car lights or the sun)	5	4	3	2	1	x	n/a
Seeing street signs	5	4	3	2	1	x	n/a
Seeing the television (Appreciating the pictures)	5	4	3	2	1	x	n/a
Seeing moving objects (e.g cars on the road)	5	4	3	2	1	x	n/a
With judging the debt or distance of items (e.g reaching for a glass)	5	4	3	2	1	x	n/a
Seeing steps or curbs	5	4	3	2	1	x	n/a
Getting a round outdoors (e.g. on uneven pavements)	5	4	3	2	1	x	n/a

because of your vision							
Crossing a road with traffic because of your vision	5	4	3	2	1	x	n/a

Adjustment because of your vision, are you	**No**	**Moderately**			**Grately**		
Unhappy at your situation in life	5	4	3	2	1	x	n/a
Frustrated at not being able to do certain tasks	5	4	3	2	1	x	n/a
Restricted in visiting friends and family	5	4	3	2	1	x	n/a
	well		**Poorly not explained**				
How well has your eye condition been explained to you	5	4	3	2	1	x	n/a

Reading and Fine Work **With your reading aids/ glasses, if used, how**							
Much of a problem do you have:	None	Moderately			Great		
Reading large print (e.g. newspaper headlines)	5	4	3	2	1	x	n/a
Reading newspaper text and books	5	4	3	2	1	x	n/a
Reading labels (e.g. on medicine bottles)	5	4	3	2	1	x	n/a
Reading your letters and mails	5	4	3	2	1	x	n/a

Having problems using tools (e.g. threading a needle or cutting)	5	4	3	2	1	x	n/a

Activities of Daily Living **With your reading aids/ glasses, if used, how**							
Much of a problem do you have:	None	Moderately			Great		
Finding out the time for yourself	5	4	3	2	1	x	n/a
Writing (e.g. cheques or cards)	5	4	3	2	1	x	n/a
Reading your own hand writing	5	4	3	2	1	x	n/a
With your every day activities (e.g. house-hold chores)	5	4	3	2	1	x	n/a

I read all the instructions and I participated in this clinical research study

Signature:_____

```
GET
  FILE='C:\Users\user\Documents\CLEM DATA.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
DATASET ACTIVATE DataSet1.

SAVE OUTFILE='C:\Users\user\Documents\CLEM DATA.sav'
  /COMPRESSED.
DATASET ACTIVATE DataSet1.
```

```
SAVE OUTFILE='C:\Users\user\Documents\CLEM DATA.sav'
  /COMPRESSED.
DESCRIPTIVES VARIABLES=AGE
  /STATISTICS=MEAN STDDEV MIN MAX.
```

Descriptives

Age	**No of Participants**	**Mean Age**	**Percentage**
18-29	9	24.66	6
29-39	20	32.80	13.33
39-49	29	41.68	19.33
49-59	22	55.00	14.66
59-69	35	65.80	23.33
69-79	32	77.25	21.33
79-89	3	85.34	2

Gender	**Frequency**	**Mean age**	Percentage	Standard deviation
Male	85	55.77	56.66%	12.73
Female	65	57..33	43.33%	11.24

Level of education	**frequency**	**percentage**
Uneducated	15	10
Elementary and Mid	50	13.33
High	25	16.66
College	60	40
Total	150	100

Marital status	**Frequency**	**Percentage**
Married	129	86
Unmarried	21	14

ANOVA Table

		Sum of Squares	df	Mean Square	F	Sig.
AGE	Between Groups (Combined)	2.856	3	.952	2.010	.0136
	Within Groups	92.824	196	.474		
	Total	95.680	199			
Gender	Between Groups (Combined)	.819	2	.410	3.404	.0001

	Within Groups	8.545	71	.120		
	Total	9.365	73			
Marital States	Between Groups	(Combined)	2.856	3	.952	0.000
	Within Groups	92.824	196	.474		
	Total	95.680	199			
Educational Level	Between Groups	(Combined)	34.366	3	11.455	39.814 0213
	Within Groups	35.102	122	.288		
	Total	69.468	125			

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Diabetes mellitus	Between Groups	(Combined)	2.856	3	.952	3.110	.73
	Within Groups		92.824	196	.474		
	Total		95.680	199			
Hypertension	Between Groups	(Combined)	.819	2	.363	2.344	.76
	Within Groups		8.545	71	.281		
	Total		9.365	73			
Both (diabetes mellitus and hypertension)	Between Groups	(Combined)	2.856	3	1.422	0.16	
	Within Groups		92.824	196	.210		
	Total		95.680	199			
Glaucoma	Between Groups	(Combined)	34.366	3	11.314	2.134	037

	Within Groups	35.102	122	.191		
	Total	69.468	125			
Cataract	Between Groups	(Combined)	2.856	3	3.412	0.29
	Within Groups	92.824	196	.325		
	Total	95.680	199			