SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

FACTORS ASSOCIATED WITH HEALTH-RELATED QUALITY OF LIFE AMONG GLAUCOMA PATIENTS RECEIVING CARE AT THE EMMANUEL EYE MEDICAL CENTER IN ACCRA

BY

EMMANUEL BOAMPONG

10638522

THIS DISSERTATION SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE

JULY, 2018

DECLARATION

I, Emmanuel Boampong, hereby declare that, except for cited literature, this thesis/ dissertation is the result of my own original research and has not been presented elsewhere either in part or in whole for purposes of the award of another degree.

Emmanuel Boampong	……	……
Student	Signature	Date
Reginald Quansah	……	……
Supervisor	Signature	Date

DEDICATION

I dedicate this work to my family for their immense support, love and prayers given me throughout this study. It is fitting that the result of this study be held in their honor.

ACKNOWLEDGEMENTS

I express my sincere thanks and appreciation to the Almighty God for His enduring mercies, grace, strength, favor and blessings He bestowed upon me throughout this study.

I acknowledge the contribution of my supervisor Dr Reginald Quansah, for his corrections, guidance, suggestions, patience and support given me in this study.

I thank my head of department, Dr. Bismark Sarfo, of the Epidemiology and Disease Control department at the School of Public Health, University of Ghana.

I am also grateful to Drs. John Ganle, Ernest Kenu and Justice Novignon for their immense contributions and support.

I acknowledge greatly the management of the Emmanuel Eye Medical Center, especially the Chief Executive Director- Elder Dr. John Oduro Boateng and the Medical Director- Dr. Kodjo Abalo.

I am grateful to the staff of the center, especially Dr. Dorothy Ofori Addo, for their contributions to this study.

I also thank my research assistant, Nephi Nelson Olympio, for the diligence, skill and support he exhibited through the data collection stage of this study.

ABSTRACT

Background: Glaucoma is a leading cause of blindness characterized by an increased intraocular pressure and damage to the optic nerve. Clinicians often focus on optic neuropathy and nerve layer analysis as measures of success or failure of therapy, yet this is only an aspect of the impact felt by the patient. Other medical, psychological and sociodemographic constraints can influence their health-related quality of life. In Ghana, patients are faced with a myriad of challenges which tend to compound the burden of the disease on them. Also, research and literature on Health-related quality of life in Ghana is currently limited. Outcomes from this study can reveal if the topical treatment given patients is commensurate with the needs of patients. These interventions can enable caregivers, policy makers and donor agencies meet the needs of patients.

Objectives: The main objective was to examine the medical, psychological and sociodemographic factors that determine health related quality of life among Glaucoma patients attending the Emmanuel Eye Medical Center.

Method: Through a cross-sectional study design, Glaucoma patients receiving care at the Emmanuel Eye Medical Center were sampled randomly over a three-week period. They were asked to complete a sectional questionnaire consisting of the World Health Organization Quality of Life- short version, and other questions. Collected data were entered into Microsoft Excel 2013™ and analyzed with Stata version 15. The means, standard deviations, domain-specific associations determined using multivariate regression and overall health-related quality of life associations from logistic regression analyses were reported.

Results: Majority of the patients were elderly, females, married or widowed, Christians, currently not working, had little or no education, received a salary/ monthly income of less than GHs 1000, with IOP levels 22-40mmHg. Of the health-related quality of life scores reported,

majority of the patients had high/ good health-related quality of life scores with mean reported scores: Physical (58.99 ± 10.19); Psychological (52.76 ± 9.45); Social (59.28 ± 12.52); Environment (57.71 ± 10.31); and Overall health-related quality of life (59.09 ± 12.60). Sex, Religion, Marital status, Income, Intraocular pressure levels, Side effects, Years since diagnosis, Anxiety and Depression were factors that influenced domain-specific scores, whiles Intraocular pressure levels influenced the overall health-related quality of life of patients.

Conclusion: The study elaborates the relevance of actions to improve the health of Glaucoma patients. From the findings of this study, the overall health-related quality of life distribution showed majority (66.85%) of patients had high/ good scores, with a lesser percentage reporting low/ poor scores. Also, the sociodemographic factors (Sex, Income, Marital status) were to a large extent positively associated with patients' health-related quality of life, whiles the association of medical factors (Side effects, Years of diagnosis, Initial IOP levels) was negative. Similarly, the psychological factors (Anxiety, Depression) influenced patients' health-related quality of life negatively. Thus, the health-related quality of life of glaucoma patients receiving care at the Emmanuel Eye Medical Center differed in direction of association, based on the kind of factor related to it.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS/ ABBREVIATIONS

AMA	Accra Metropolitan Assembly
CHAG	Christian Health Association of Ghana
COMTOL	Comparison of Ophthalmic Medication for Tolerability
EQ-5D	European Quality of Life- 5 Dimension
GHS	Ghana Health Service
GQL-15	Glaucoma Quality of Life-15
HADS	Hospital Anxiety and Depression Scale
HRQOL	Health-Related Quality of Life
IOP	Intraocular Pressure
NHIS	National Health Insurance Scheme
NTG	Normal Tension Glaucoma
OHT	Ocular Hypertension
POAG	Primary Open Angle Glaucoma
QoL	Quality of Life
RCTs	Randomized Control Trials
SF-36	Medical Outcomes Study (Short Form-36)
SF-6D	Short Form 6 Dimension
SPH	School of Public Health
TSS-IOP	Treatment Satisfaction Survey for Intraocular Pressure
VFQ-25	Visual Functioning Questionnaire-25
WHO	World Health Organization
WHOQoL – Bref	World Health Organization Quality of life- Short Version

DEFINITION OF TERMS

Adult Onset Primary Open Angle Glaucoma: Glaucoma diagnosed at age 35 years and above.

Juvenile Onset Primary Open Angle Glaucoma: Glaucoma diagnosed before the age of 35 years.

Normal tension Glaucoma: glaucoma in the presence of apparently statistically normal intra ocular pressure (i.e. IOP < 22mm Hg)

Biopsychosocial model: It considers biological, psychological, and social factors and their complex interactions in understanding health, illness, and health care delivery.

Quality of life: a multi-dimensional construct made up of a number of independent domains including physical health, psychological well-being, social relationships, functional roles and sense of life satisfaction.

Intraocular Pressure (IOP): It is the fluid pressure inside the eye and is considered normal when its measurement is below 22mmHg. Above this can lead to Glaucoma.

Glaucoma: a visual disease in which the intraocular pressure (IOP) is usually above the level compatible with continued health and function of the eye.

CHAPTER ONE

INTRODUCTION

1.1 Background

The World Health Organization (WHO) defines health as "a state of complete physical, mental, and social well-being not merely the absence of disease or infirmity" (Huppert, 2009). Medical personnel usually focus on the kind of health delivery typically involving patients' medical history and either physical or laboratory examination for treatment and successful outcome measures (Swan, 2009). The definition of health, though very elaborate, unmistakably indicates the aim of medical interventions. The measure of how successful an intervention is, is viewed differently in the eyes of each patient (Dwamena et al, 2012). However, a healthy population is usually determined with predictors such as, the occurrence/ nonoccurrence of an illness or mortality (Alexopoulos et al, 2014). This model- the "biomedical model"- is centered on the causative organism, mechanism, social, physiological as well as clinical results (Curro & Gillam, 2014).

Glaucoma is characterized by an increased intraocular pressure (usually above 21mmHg) with damage to the optic nerve. A depiction of the diseased (glaucomatous) eye in contrast with a normal eye is illustrated in Fig. 1.1 below. The disease is a major cause of blindness aside cataract. Global occurrence of glaucoma is usually between 1% and 4% of people older than 40 years. Regulating intraocular pressure (IOP) is a critical factor to preventing the disease in persons who are >40 years (Gyasi et al, 2014). Some medical interventions such as eye drops, incisional surgery and laser therapy were developed to reduce the IOP levels. The type of treatment given to a patient usually depends upon their characteristics, effectiveness of a

biological agent, medical history, medication tolerability, and how often it is to be administered (Hollo et al, 2018).

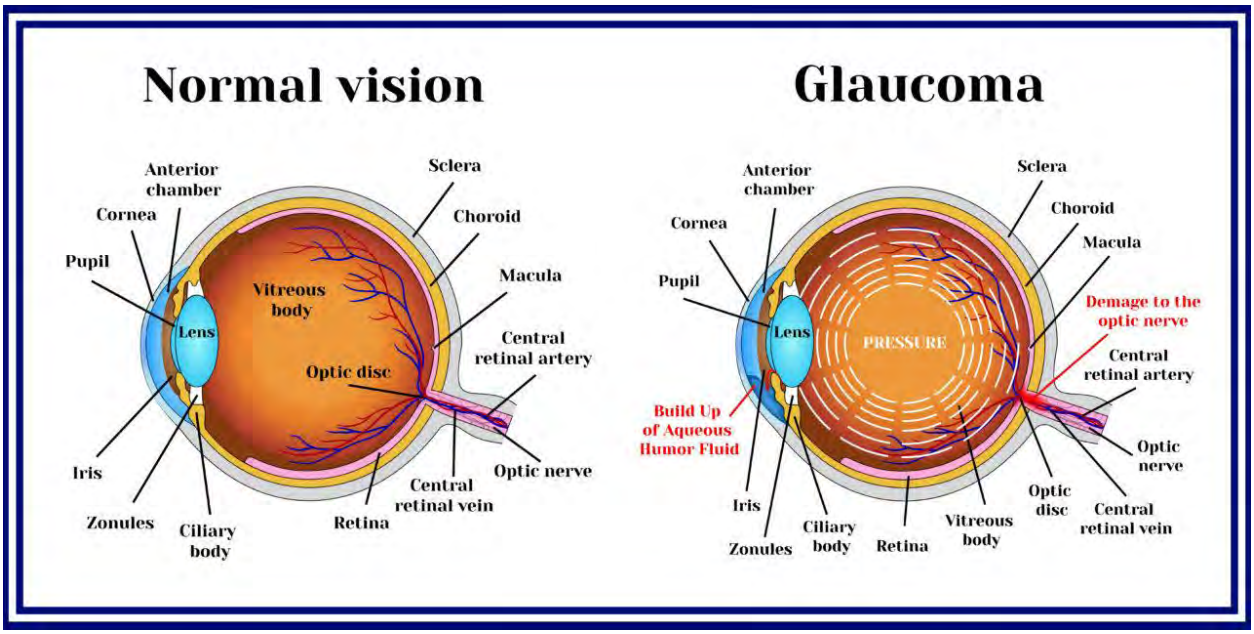

Fig. 1.1 Glaucoma: Damage to optic nerve and pressure build up

Source: (www.pemftherapyeducation.com, accessed 18th November 2017)

Patient satisfaction is of immense assistance in aiding medical care, since they are influenced by non-medical factors. It is postulated that patient satisfaction will most probably lead to compliance with medical treatment and better quality of life (Loon et al, 2015). Satisfaction is related to meeting the general and condition-specific needs of the patient. Health workers benefit from satisfaction surveys through service improvement (Thota et al, 2012). In the past, greater attention was given to quantitative/ biomedical matters such as IOP, visual field, and optic nephropathy- since they were easily modifiable -making qualitative measures such as Quality of life (QoL) less interesting to physicians (Fea et al, 2017). However, several medical fields are

placing growing consideration to patients' quality of life in recent times. QoL measurements can be time consuming and influenced by other factors (physical, psychological, relationships, affluence etc.), not related to the disease (Aspinall et al, 2008).

However, an important aspect of patient care with chronic diseases, has been identified as assessing health-related quality of life (HRQoL) evaluations. These evaluations give an essential feedback as to how effective/ ineffective medical therapy has been. They are also very valuable tools in analyzing the cost-effectiveness of treatment (Wonderling et al, 2011). The measurement of health and its effect should include an indication of changes in disease severity and rate of occurrence as well as an assessment of wellbeing evaluated through an enhancement of patients' health-related quality of life. Regarding healthcare, quality of life and health related quality of life are sometimes interchanged. Quality of Life is defined by the WHO as "individuals' 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" (Caqueo-Urizar et al, 2009). This concept affects an individual's level of independence, social, physical, psychological health and relations with the environment (Pan et al, 2009). It is thus, an extension of the WHO's definition of health. Assessment of HRQoL and the factors that influence it has become important because of its essence in a patient's disease and drug treatment. Even though old measures like morbidity, physical and biological changes give necessary information regarding treatment, a patient's physical, psychological, social and environmental health might be inaccurately represented by them (Leigh, 2013). This improves health worker – patient relationship, because the patient's health assessment becomes a comprehensive one (Greene & Hibbard, 2012). When policies are also implemented, it is essential to determine its impact on patients by evaluating the implemented policies.

1.2 Problem statement

Even though there have been several advances in glaucoma therapy, the disease still has a very high burden on global populations (Fig. 1.2). This burden is projected to increase with time. Statistics from the year 2010 showed that, averagely 60 million people had the disease- a figure which is projected to increase to 71 million in 2020 (Tham et al, 2014). Medical management of the disease is not always successful in Sub-Saharan Africa, leading to poor compliance (Realini, 2013) (Lawrence and Budenz, 2013). Although it is a major cause of loss of sight in Africa, treatment of the disease is inadequate in the attention and resources it receives.

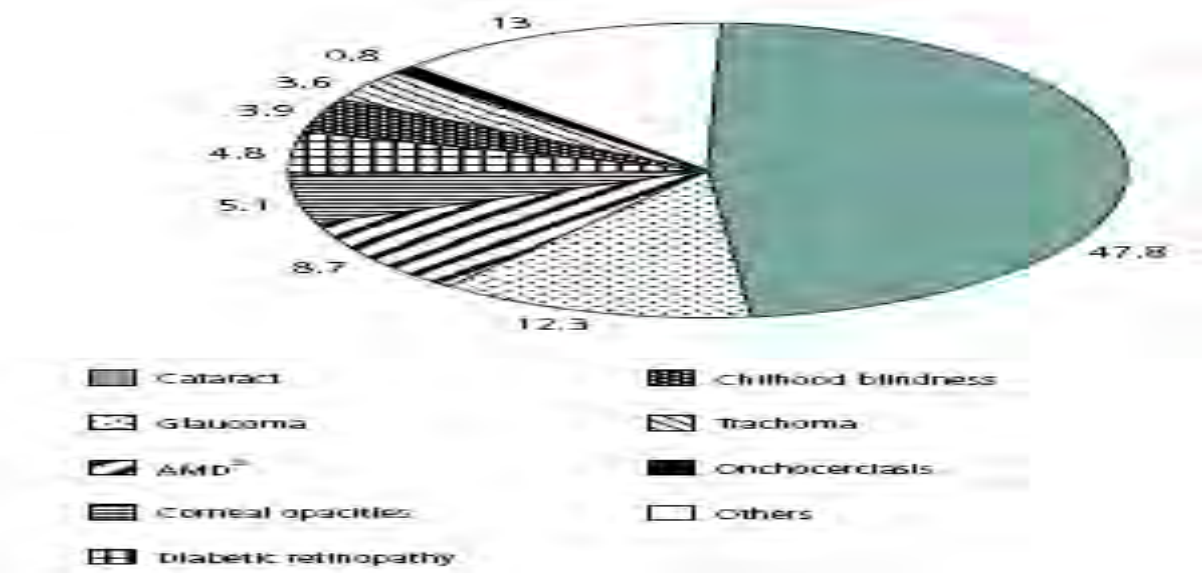

Fig. 1. 2 Global burden of eye diseases and causes of blindness

Source: (https://www.scielosp.org/article/bwho/2004.v82n11/844-851/, accessed 18th November 2017)

Primarily, reduced visual ability is a major predictor of HRQoL in patients (Goldberg et al, 2009). Also, side effects like discomfort to the eye, regular check-ups which are usually expensive and time-involving, adds to the disease burden (Skalicky and Goldberg, 2008). There

exists a negative relationship between HRQoL and psychological burden, as an increased burden comes with fear of blindness, social isolation and depression (Skalicky et al, 2012). These and many other medical, psychological and social constraints can influence the patient's state of health as shown in HRQoL evaluations (Paletta Guedes, 2012).

The topical treatment offered in Ghana focuses on medical aspects of treatment at the expense of HRQoL assessment, which has become a very important aspect of managing disease conditions. Challenges faced by Glaucoma patients in the country, include high financial cost associated with the various treatment options, delays in healthcare delivery, distance to health facilities and very limited number of drugs on the National Health Insurance Scheme. Tentatively, both clinician and patient can achieve better compliance with treatment when issues relating to HRQoL are addressed (Hahn et al, 2010). This study sought to identify the factors that can influence health status of glaucoma patients at the center and how these factors influenced them.

1.3 Conceptual framework

The conceptual framework shown in Fig. 1.3 illustrates how the various determinants possibly affect the HRQoL of Glaucoma patients in Ghana. HRQoL is demonstrated as a person's overall health: aimed at fulfilling the purposes of life. It encompasses physical health, psychological health, social functioning and the environmental health of individuals (Huber et al, 2011). The loss of vision has persistently been a major factor in determining good HRQoL among patients, even though persons differ from society to society (Medeiros et. al, 2015).

Social factors encompassing Socio-economic status index and Socio-demographic factors from several studies have influenced HRQoL. Employment, which forms a greater part of our daily life, influences physical and mental health which translates into the HRQoL. Reduced individual income is associated with reduced psychological and overall HRQoL whiles increased income is

linked to increased mental health and overall HRQoL. A higher education is usually indicative of a higher HRQoL. Psychological factors such as anxiety, depression and stress have always had an influence on the HRQoL and therefore the need to adapt coping methods.

Regarding medical factors, as Glaucoma progresses optic neuropathy increases and eventually leads to blindness (Cedrone et al, 2008). A measure of the level of optic neuropathy is portrayed by the Intraocular pressure (IOP). A higher IOP signifies reduced physical health whiles a lower IOP usually indicate an improved health (Diekmann & Fischer, 2013). The effects of some drugs can only be discovered from subjective assessment which helps clinicians to inform patients on the effects of drug regimen and how to manage these side effects (Leigh, 2013). The occurrence of a secondary morbid condition or co-morbidity usually influences greatly whether the health-related quality of life improves or reduces in a disease condition. This study sought to understand how the factors illustrated in Fig. 1.3 affect the HRQoL of Glaucoma patients.

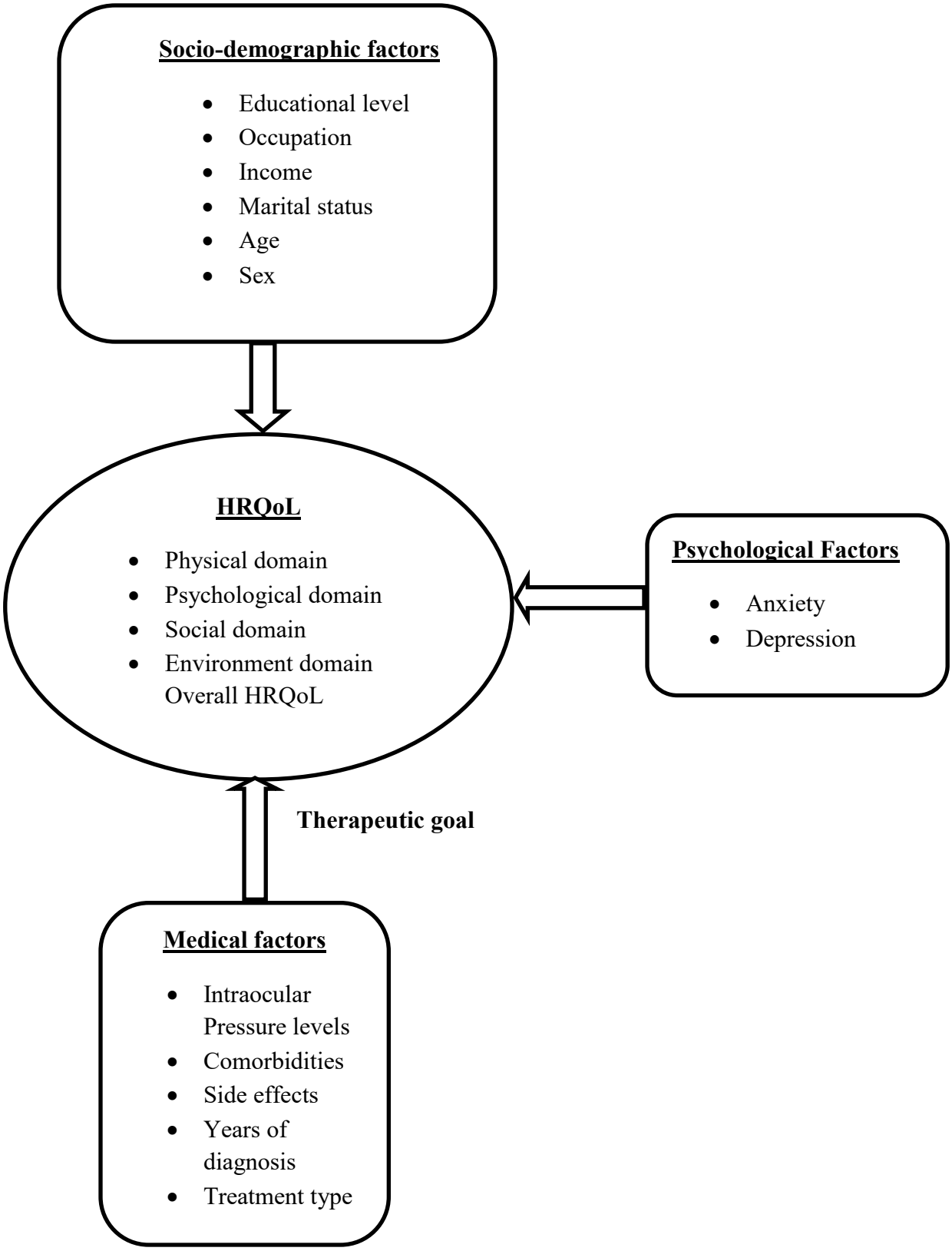

Fig. 1.3 Conceptual Framework of the factors associated with HRQoL among Glaucoma patients on treatment adapted from Gessesse & Damji's (2013) version of the biopsychosocial model.

1.4 Justification

Generally, research into QoL in Ghana has been very limited and a focus on HRQoL presents an even scanty literature available. Some available literature identified includes: Donkor et al, (2014) who found that the physical, psycho-emotional, and cognitive domains of HRQoL were affected in patients. Ababio et al, 2017, revealed an association between several psychosocial factors and HRQoL of Diabetes Mellitus patients in Ghana and Nigeria. Gyan et al, (2015) concluded that there exists a strong positive association between social support and quality of life.

Glaucoma can influence the HRQoL and may result in some work inefficiencies. Outcomes from this study can reveal if the topical treatment given patients is commensurate with the needs of patients. These interventions can enable caregivers, policy makers and donor agencies meet the needs of patients. Documenting the mean HRQoL scores can give some information about the scope of health status for glaucoma patients in Ghana to improve planning and cost-utilization necessary for the implementation and evaluation of population health interventions.

This study is a novel HRQoL work on Glaucoma in Ghana and sought to provide an understanding of how Sociodemographic factors (age, sex, income, education, marital status, and occupation), Psychological factors (anxiety, depression) and Medical factors (Years of diagnosis, IOP level, Topical treatment/ treatment type, Comorbidities, Side effects) affect the health status of Glaucoma patients receiving care at the Emmanuel Eye Medical Center.

1.5 Objectives

1.5.1 General Objective

To examine the medical, psychological and sociodemographic factors that determine health-related quality of life among Glaucoma patients receiving care at the Emmanuel Eye Medical Center.

1.5.2 Specific Objectives

1. To measure the health-related quality of life among Glaucoma patients

2. To identify sociodemographic factors influencing HRQoL

3. To identify the medical and psychological factors associated with HRQoL

4. To evaluate associations between sociodemographic, medical, psychological factors and HRQoL

1.6 Research Questions

1.6.1 Hypothesis

Sociodemographic, medical and psychological factors have the same effect on the health-related quality of life of Glaucoma patients receiving care at the Emmanuel Medical Eye Center.

1.6.2 General Research Questions

1. What is the health-related quality of life among Glaucoma patients?

2. Do sociodemographic factors influence HRQoL?

3. What medical factors are associated with HRQoL?

4. Are psychological factors associated with HRQoL?

5. How are these sociodemographic, medical and psychological factors associated with HRQoL?

CHAPTER TWO

LITERATURE REVIEW

2.1 Focus of literature review

The literature review of this research focuses on the Biopsychosocial model of health, Glaucoma as a chronic condition, Prevalence of Glaucoma, IOP as a key influencer of Glaucoma treatment, Topical Glaucoma treatment options, HRQoL, HRQoL measuring instruments, HRQoL of Glaucoma patients, the relationship between socio-demographic variables (age, sex, marital status, educational status, occupation and income), biological factors (IOP level and co-morbidities), psychological factors (anxiety and depression) and HRQoL respectively.

2.2 The Biopsychosocial model of health

Traditional models of treating illness impact the decisions made regarding a patient's health and health care delivery. The biomedical model, a dominant model in health care delivery for a century, was not comprehensive enough in addressing the several types of illness because of the three assumptions which defined it: every disease has a single cause, disease is always the outcome, and the cessation of disease will automatically return an individual to a healthy state. The World Health Organization's international classification of health and well-being, however, gives a more elaborate, less pathological explanation for the cause of diseases (Phelan et al, 2010).

These events and occurrences led to the development of the biopsychosocial model in 1977 by Drs. George Engel and John Romano (Cohen and Brown, 2010). Whereas, the traditional models of healthcare delivery were focused on the causative organism as well as other and other natural processes to deal with the disease, this model did approach the disease by stressing on the

relevance of understanding health and illness in a holistic context (Hatala, 2012). It is fashioned after the networking of systems in that the interconnectedness of both the mind and body is focused on. It considers the medical and non-medical factors (psychological and social) and their interfaces in dealing with issues of health, illness, and health care delivery (Ghaemi, 2009). Here, both natural and social sciences become fundamental aspects of medical practice in that, social, psychological and environmental determinants are not just an afterthought or secondary issues but that they become significant definers both in their own properties as well as how they associate with medical factors and an individual's overall health (Fava & Sonino, 2008).

In this regard, abilities that stem from human beings are very essential to the success of this model and details the scientific application of processes and principles towards medical, psychological, environmental and social issues regarding the health of an individual (Ghaemi, 2009). Whiles traditional models focus on the notion that all phenomena are better interpreted and solved using the lowest levels in natural systems (such as cellular or molecular), the biopsychosocial model postulates that different medical occurrences are better interpreted using scientific principles at varied levels of the natural systems broader range (Hatala, 2012).

Some benefits from this model are: the maintenance of medical, psychological and social factors as critical factors in determining health and illness. It also stipulates that health and illness are multi-causal in that they are influenced by several factors which produce several effects/ outcomes. The mind and body cannot be distinguished in matters of health and illness (Fava & Sonino, 2008). Also, it indicates that the mind and body are affected by a person's state of health. It states that improved health is obtained by addressing the medical, psychological, environmental and social needs of patients. There are several implications to this model including: considering the interconnectedness of medical, psychological and social factors in

diagnosing and evaluating a person's state of health or illness. Treatment prescriptions must examine all these factors to achieve success. It requires an interdisciplinary team approach and stresses the importance of the patient and doctor relationship in healthcare delivery (Pilgrim, 2015). Also, an effective relationship between the patient and the doctor can increase a patient's use of the healthcare services.

In order to achieve a successful implementation and inculcation of this model in clinical care, the medical practitioner should: Comprehend the pivotal role of relationships in health care delivery; Utilize self-awareness and extensive knowledge as a tool for adequate diagnosis and therapy; Situate the diagnosis in the context of the patient's history and other circumstances in life; Make decisions as to the portions of the medical, psychological, and social domains that are extremely vital to interpreting and promoting efficient healthcare delivery; and Treat patients in a multidimensional and multi-structured manner (Pilgrim, 2015) (Alvarez et al, 2012). The model clearly implies that practitioners must understand in addition to biological factors; Social factors, Psychological factors and in recent times, spiritual/religious factors that influence an illness to be able to treat it appropriately (Hatala, 2012).

2.3 Glaucoma as a chronic condition

Glaucoma is a visual disease in which the intraocular pressure (IOP) is usually above the level compatible with continued health and function of the eye. Losses of retinal nerve fibers give rise to corresponding visual field changes characteristic of the disease (Medical encyclopedia, 2013). There are several classifications of the disease, but traditional classification is according to: 1. Angle between the iris and cornea in the anterior chamber of the eye into open-angle and angle-closure. 2. Presence of a recognized ocular or systemic cause called secondary glaucoma or is

idiopathic, primary glaucoma. 3. Age at diagnosis: congenital in children before the age of 3 years, juvenile onset from 3 to 34 years and adult onset from the age of 35 years. Recent advances in molecular biology are beginning to point to a classification based on whether it is inherited or not (Wiggs, 2013).

2.4 Prevalence of Glaucoma

The prevalence of glaucoma varies from population to population, of which the largest study (4,709 people) conducted in a predominantly black population, the Barbados Eye study found Blacks to be 7.0%, mixed 3.3% and whites 0.8% (Leske et al, 2010). There exist varied clinical manifestations regarding the rate of occurrence and severity of the disease in the Sub-Sahara African region. Population-based studies revealed that prevalence of glaucoma was estimated at 4.5% for Southern Africa, 2.1% in Nigeria, 8.4% in Ghana, 8.2% in Cameroon and an overall African estimate of 4%, whiles Primary Open Angle Glaucoma (POAG) was found to be the most prevalent type of the disease (Kyari et al, 2013). The situation in Ghana seem to suggest that the disease is the single most occurring cause of irreparable loss of sight. In persons aged 40 years and older, the disease occurrence is estimated at: Ghana- about 8%, United States about 2% (Budenz et al, 2013) (Otabil et al, 2013). Compared to other African countries, this prevalence of the disease is high in Ghana.

2.5 IOP as a key influencer of Glaucoma treatment

The main goal of virtually every glaucoma therapy is to reduce intraocular pressure (IOP) levels. The effectiveness of medications to halt disease progression in different types of glaucoma: primary open angle glaucoma (POAG), ocular hypertension (OHT), and normal tension glaucoma (NTG) is evident in clinical practice and randomized control trials (RCTs). With

intense physical activity involving the exertion of muscles and elevated respiration, intraocular pressure levels may increase. This can subsequently lead to reduced eye filtering pressures coupled with its associated possibility of mechanical and ischemic optic nerve damage. Topical therapeutic interventions include eye drops, laser therapy, and incisional surgery aimed at reducing the IOPs to a normal level for patients (Challa, 2008).

2.6 Topical Glaucoma treatment options

Topical treatment aimed at decreasing IOP is for the whole life of patients and usually very expensive. Treatment options come in three forms: Drugs (eye drops and other medication), Laser therapy and Operative/ Incisional Surgery. Currently, only three drugs in Ghana are listed on the National Health Insurance Scheme (NHIS). Compliance is of major importance to get the full potential protective effect against visual field defect. Most glaucoma HRQoL evaluations measured in clinical trial settings showed small differences between the three therapeutic options which rarely reached the statistical significance (Weinreb & Kaufman, 2009). This was further reiterated when the HRQoL scores did not differ between medically and surgically treated groups of patients in another cross-sectional study (Guedes et al, 2013).

2.7 Health-Related quality of life (HRQoL) Quality of Life

HRQoL is advancing at a rapid pace to be the acceptable assessor of patient health outcomes in randomized trials, cost effectiveness analysis and medical care. A network of factors coupled with increasing cost of healthcare delivery and an insurgent knowledge that traditional outcomes are not sufficient, has redirected the focus of healthcare delivery on the relevance of accepting and advancing the HRQoL of persons living with glaucoma. Its assessment serves as a health

indicator aside the use of clinical indicators and goes a long way to improve the relationship between clinicians and patients, impacting treatment and care (Prakash, 2010).

HRQoL is viewed as a multi-dimensional outcome with different domains including physical health, psychological health, environmental health, social relationships, general health and satisfaction with life. Each of these domains is independent and can assess HRQoL independently. Each domain can be evaluated from a patient's perception regarding their health coupled with a level of relevance attached to each domain. Most these evaluations utilize structured questionnaires which depend on outcomes reported by the patient (Fayers & Machin, 2013). The WHO developed an assessment tool after it had identified that little is known about the HRQoL of chronic disease patients with the global downturn. Pilot studies reported at centers where the assessment tool had undergone trials to be validated showed that the level is generally acceptable (Prakash, 2010).

2.8 HRQoL measuring instruments

There has been widespread interest in studying patient centered outcomes for some few decades and has led to the development of tools for such measurements. HRQoL outcomes are often complex qualitative variables, which cannot be easily simplified. Each instrument consists of questions grouped into domains and scored on Likert scales (Fayers & Machin, 2013). Some HRQoL measuring tools include: Medical Outcomes Study 36-Item Health Survey- the SF-36- (Busija et al, 2011) by Research and Development (RAND) corporation, the Treatment Satisfaction Survey for Intraocular pressure (TSS-IOP) and the Hospital Anxiety and Depression Scale (HADS).

Other tools are the National Eye Institutes' VFQ-25, Short Form- 6 Dimension (SF-6D), Time Trade-off and the European Quality of Life-5 Dimension (EQ-5D). From their assessment,

Browne et al, (2012) estimates the mean VFQ-25 score (72.88 ± 22.10) produced the overall highest and most significant correlations with tests of visual function. However, the World Health Organization Quality of Life – Short version (WHOQoL- BREF) developed by the WHO, is an internationally accepted instrument developed for measuring HRQoL.

2.9 Medical factors and HRQoL

Intraocular pressure level is the most important clinical indicator/ predictor of Glaucoma and hence lowering it is the therapeutic goal of almost every standard topical treatment for the disease. The presence/ absence of comorbidity, defined by the Mosby's Medical Dictionary as two or more medical conditions or disease processes that are additional to an initial diagnosis, also has a significant bearing on the patient's overall health and well-being. A study by Lin et al, (2010) identified co-morbidities in Glaucoma as: Hypertension, Diabetes, Hyperlipidemia, Systemic lupus erythematosus, Hypothyroidism, Fluid/ Electrolyte disorders, Depression and Psychosis. Other established co-morbidities are dementia, cataract, trachoma, liver disease, peptic ulcer and onchocerciasis.

Side effects have also been a good indicator of patients' satisfaction and related quality of life for several health conditions (Street et al, 2009). Some known side effects include: change in iris color, ocular surface irritation, blurred vision, fatigue, shortness of breath, headache, allergic reactions, stomach upset, drowsiness, inflammation and kidney stones (Uusitalo et al, 2010). The level of side effects associated with a treatment determines whether the HRQoL increases or decreases. Whigham et al, (2018) also identified significant associations between years of diagnosis/ how long a patient has lived with the disease and their HRQoL.

2.10 Psychological variables and HRQoL

According to Zoungrana et al, (2017), depression is associated with anxiety, increased Body-Mass Index (BMI) and plays an important role in disease progression**.** Depression is associated with HRQoL. Patients free from depression or minimal depression have higher HRQoL scores (Briongos Figuero et al, 2011). Chronic disease patients usually experience anxiety from their condition and from medications taken. Women experience high rates of depression as a result of reproductive health related worries (American Psychiatric Association, 2012). Anxiety is associated with HRQoL; as anxiety rates decrease, HRQoL improves (Degroote et al, 2014).

2.11 Sociodemographic factors and HRQoL

Many sociodemographic factors influence quality of life (Figuero et al, 2011)**.** Sex, age and marital status were significant determinants of HRQoL (Mafirakureva et al, 2016). A study done in Ethiopia showed that females reported a lower HRQoL as compared to males (Tesfay et al, 2015) and this was attributed to sexual differences in the expression of somatic complaints and psychological illness. Increasing age shows deterioration in physical health and hence a lower HRQoL (Degroote et al, 2014). Marital status has a significant effect on HRQoL. Married women show better HRQoL as compared with unmarried women and this was attributed to the physical, emotional and social support they receive from their partners (Bello and Bello, 2013).

Income, education and employment are also positively and significantly associated with HRQoL (Mafirakureva et al, 2016). It is postulated that educated person may understand the disease better, leading to better coping attitude, and interact with other people in a harmonious way. With higher education, standard of living improves (Kumar et al, 2014) as education largely informs ones' occupation and income and translates into a possible increase in the HRQoL. Another study by Mwesigire et al, (2015) also supported the findings that education is crucial in

improving quality of life as it may improve income and HRQoL. A high socioeconomic status helps patients in engaging in more preventive and therapeutic health (Odili et al, 2011).

2.12 Conclusion

Health related quality of life (HRQoL) assessment for chronic disease patients is a very important aspect of the disease condition and therefore very important to investigate how it relates to certain indicators in the life of an infected person. Factors such as, income level, employment, IOP level, depression and anxiety are most frequently and consistently reported to be associated with HRQoL among Glaucoma patients.

CHAPTER THREE

METHODOLOGY

3.1 Study design

A cross-sectional survey using a quantitative approach in a hospital-based setting was used for this study. Face to face interview with structured questionnaires were used in the data collection. Information collected included basic demographic data, measured intraocular pressures, treatment options used and the health-related quality of life. Prior to data collection, the medical records (medical card and history) of patients were used to verify that respondents had been diagnosed of the disease by a qualified medical practitioner.

3.2 Study location

This hospital-based survey was carried out at the Emmanuel Eye Medical Centre; a large ophthalmology referral center, in the Greater Accra Region. The center is located at East Legon within the southeastern part of the Accra Metropolitan Assembly (AMA). It was established in 1993 by Dr. Herbert Billman, an American Ophthalmologist. In 1998, it was absorbed by the Luke Society as one of their ministry sites. It is registered by Ghana's Ministry of Health as a mission hospital and member of the Christian Health Association of Ghana (CHAG).

The center holds daily religious services to cater for the spiritual needs/ health of patients, as part of its approach to healthcare. It has various departments for the effective execution of its duties. These are the: Eye Department, Pharmacy Department, Laboratory Department, General OPD, Medical and Specialist Clinics (Diabetic Clinic, Dermatological Clinic, Cardiology Clinic, Asthma Clinic, Women's Health Clinic, Men's Health Clinic), Christian Ministry and

Administration. These departments work together to ensure that the health needs of patients are achieved.

The emphasis of this study was the Eye Department, which is a referral center for other hospitals/ clinics and attends to diverse people. It offers services such as: General consultation, Visual Acuity, Refraction, Visual Field Test (VFT), Optical Coherence Tomography (OCT), Dispensing of drugs, Laser therapy and Surgical treatment for various eye conditions.

3.3 Study/ target population

The source population included all Glaucoma patients receiving care at Emmanuel Eye Medical Center in Accra. From a possible two hundred patients receiving care at the center every month, one hundred and eighty-seven individuals (see 3.7.1) were randomly selected (see 3.7.2) at the study site to participate in the study.

3.4 Inclusion criteria

I. Patients diagnosed with Glaucoma by a qualified medical practitioner and receiving care at the study location were included in the study.

II. Eligibility criteria for the study population considered patients who were forty (40) years and above and readily gave their consent to taking part in the survey as prior prevalence of the disease was established as higher in Ghana for persons in the above age range as compared to those less than 40 years (Budenz et al, 2013) (Otabil et al, 2013).

III. Patients on glaucoma medical therapy as well as prior ophthalmologic procedures including laser therapy and filtering surgery were also included in this study.

3.5 Exclusion criteria

I. Any retinal disease-causing visual field defects or macular disease which significantly impaired central vision and might mask the effect of the disease was indicated as an exclusion criterion.

II. Children or juveniles between the ages of 3 to 18 years diagnosed with the disease were also excluded from the study due to their inability to readily give consent.

3.6 Study variables

3.6.1 Dependent Variable

The dependent variable was health-related quality of life and was measured using the WHOQOL-Bref (Skevington & McCrate, 2012). The tool consists of 4 domains: the physical, psychological, social and environment domains as well as questions on general QoL and health satisfaction. The physical domain which seeks to assess patients' physical health, consists of 7 questions on mobility, sleep, pain, energy, activities, working ability and dependence on medical aid. The psychological domain representing psychological health of patients consists of 6 questions on spirituality, concentration, enjoying life, bodily acceptance, self-esteem, positive and negative feelings.

The social domain consists of 3 questions on personal relationships, sexual activity and social support to assess the social health and relationships of patients. The environment domain assesses the environmental health of patients and has 8 questions on safety, physical and home environment, finances, information, leisure, access to health care and transportation. These questions were framed to receive responses from participants on a scale for either strength,

capacity/ ability, rate of occurrence and assessment. Questions regarding strength had responses as: not at all, a little, a moderate amount, very much and extremely.

Questions on capacity/ ability had: not at all, a little, moderately, mostly and completely. Also, questions on rate of occurrence included: never, seldom, quite often, very often and always. Whiles questions on assessment were responded to as either: very dissatisfied, dissatisfied, neither dissatisfied nor satisfied, satisfied and very satisfied; or: very poor, poor, neither good nor poor, good and very good. From the least to the highest of these responses their respective numbers on a numeric scale of 1, 2, 3, 4 or 5 were similarly given. These numbers were computed and used in the calculation of the patients' health-related quality of life (Skevington & McCrate, 2012) (Almeida-Brasil et al, 2017).

3.6.2 Independent Variables

The independent variables were Sociodemographic factors, Medical factors, and Psychological factors. Sociodemographic factors covered age, sex, income, educational level, employment status and marital status were personal details provided by the patient. Medical factors included the level of Intraocular pressure (an important biological indicator/ predictor of Glaucoma and its severity), side effects, years (duration) since diagnosis, treatment type being used by patients and comorbidities; which are other disease conditions the patient had aside what was being investigated. Psychological factors focused on the anxiety and depression levels of a patient four weeks prior to data collection. The Hospital Anxiety and Depression Scale (HADS) was used to assess these factors and data collected were recorded as either normal, mild, moderate or severe.

3.7 Sampling

3.7.1 Sampling Method

A simple random sampling technique was used to select study participants at the study site. Out of a possible 200 Glaucoma patients listed in the medical records as receiving treatment from the study site, numbers were assigned to them. Of these, 187 patients were randomly selected using a random number generator. Based on their assigned numbers and the day participants did come to the center to receive care, they were asked of their willingness to participate in the study. Each participant willing to participate in the study was asked, on the day he/ she reported to the center for care, to give their consent to completing a questionnaire about their sociodemographic data, psychological and medical state which informed the private investigator of their health-related quality of life. Previous and current medical records of diagnosed persons at the center were collected and the corresponding medical factors verified for each patient, on the day he/ she reported to the center.

3.7.2 Sample Size Calculation

The sample size of 187 was determined using Cochran's formula (Bahadoran & Mohamadirizi, 2015).

$n = (z^2 \times s^2)/ e^2$

Where n = Sample size

s = standard deviation of prior study population = 22.10 (Browne et al, 2012)

z = 1.96 for a 95% confidence interval

e = α level of 0.05 or 5%

Substituting the values into the formula,

$n = (1.96^2 \times 22.10^2)/ 5^2 = (3.8416 \times 488.41)/ 25 = 1876.275856/ 25$

n= 75.05 ≈ 75

Adjusting with a design effect of 1.5, n≥ 75 x d

d=study design of 1.5

n≥ 75 x 1.5 = 112.5 ≈ 113

Considering a 10% adjustment for incomplete questionnaires and non-response, n≥113 + 11=124

To increase the power of the study, a power factor of 1.51 was included in the calculation, hence,

n=124 x 1.51 ≈ 187

One hundred and eighty-seven (187) glaucoma patients receiving treatment at the Emmanuel Eye Medical Center took part in this study.

3.8 Data collection

Data collection was carried out with the help of one research assistant who was trained on the research topic, data collection techniques and ethical considerations. Data collection was done by face to face interview with a thorough explanation of questions and answers within each section of the questionnaire. Oral translation into local dialect was offered for participants who did not understand English. The interviewer administered structured questionnaires to obtain data from the respondents.

The questionnaire included the validated WHOQoL-Bref- for measuring the outcome variable- and some other questions on the sociodemographic variables, medical history and the Hospital Anxiety and Depression Scale (HADS) for depression and anxiety. Data was collected by the principal investigator and a research assistant. Averagely, about 15 minutes was used to complete each questionnaire designed to assess health-related quality of life. Both the electronic copy of the patients' medical history at the hospital and their medical card/ form was accessed to extract and verify information regarding questions on medical factors.

3.9 Data processing and analysis

Each questionnaire was coded to prevent collecting and entering the same information into the software more than once. Data collected were entered into Excel software version 2013™ and then exported into Stata version 15 for statistical analysis. Demographic and other data were analyzed using basic descriptive statistics such as frequencies, means and standard deviations. The QoL questionnaire was analyzed with means scores from each domain calculated and subsequently transformed to a scale of 4 - 20, using the formula (Domain score/ number of items within the domain) x 4, with a score of four (4) representing the poorest score and twenty (20) representing the best score. These scores were further converted to a 0-100 scale for easy interpretation of results (Skevington & McCrate, 2012).

Questions on general health and QoL were treated and analyzed in a procedure similar to that used by Feder et al, (2015). Renaming and categorization of questions was done using the method indicated by Bani-Issa, 2011. Thus, scores on the 0-100 transformed scale; ≤ 45 were considered low/ bad, 46-65 was moderate/ normal and > 65 was considered high/ good. The Hospital Anxiety and Depression Scale (HADS) was categorized and analyzed in a manner similar to Michopoulos et al, (2008). Thus, values from each coded response was added separately for the variables: anxiety and depression. A total score of less than 7 implied non-cases (normal), 8- 10 for mild cases, 11-14 for moderate cases and 15 -21 for severe cases.

To establish relationships between social factors, medical factors, psychological factors and HRQoL domains, univariate and multiple linear regression analysis with statistically significant level set at $p< 0.05$ was employed in a manner similar to Almeida-Brasil et al, (2017) and Bani-Issa, (2011). Issues of collinearity were addressed using the Variance Inflation Factor (VIF) set at 10. A VIF of < 10 was considered to have little or no issues with collinearity hence proceeding

with the analysis, whereas a VIF ≥ 10 had issues of collinearity which needed to be addressed. Demographic data, evaluation of the impact on visual loss and interventions to treat glaucoma were utilized. Categories of the independent variables were reclassified after the background characteristics were determined (in the univariate, multivariate and logistic regression analyses), for a much simpler interpretation and understanding of the analyses. Possible association with different variables were analyzed using the Analysis of Variance (ANOVA) test due to levels of categorization within the variables (Almeida-Brasil CC et al, 2017). A two-tailed p-value of less than 0.05 was considered statistically significant. The overall Quality of Life was categorized and analyzed with the independent variables using logistic regression analysis (Feder et al, 2015). Factors that were statistically significant in the linear and logistic regression analyses after adjusting, were reported as associated with HRQoL.

3.10 Quality control

Pre-testing of the questionnaires was done at the Emmanuel Eye Medical Center prior to data collection. It was not done at a proposed pre-testing site (Legon Hospital) due to some administrative, logistics and time constraints encountered. The pre-testing involved nine (09) different glaucoma patients randomly sampled over a period of one-week. The principal investigator ensured that patients for this stage were not in any way related/ involved with the main study or its participants. Hence, limiting a possible bias that may have influenced outcomes and validity of the study.

The data from this stage, indicated a feasible questionnaire and study, appropriate wording for related questions and an average sampling time of 15 minutes for each questionnaire. A possible obstacle identified was the use of English language, thus, informing the oral translation into local dialects for varied participants in the main study. These outcomes informed the training and

orientation of the research assistant. Completed questionnaires were kept securely and will be destroyed after five (5) years. The research assistant was a nurse with some amount of knowledge on the topic of study. Numbers were assigned to patients responding to the study to ensure that the same patient was not captured twice.

3.11 Ethical issues

Ethical clearance was sought from The Ghana Health Service Ethical Review Committee. Approval was sought from the administration of the School of Public Health (SPH), University of Ghana. Permission to carry out the study at the Emmanuel Eye Medical Center was sought from the Medical Director and Chief Executive Officer of the Center. Permission to use the WHOQOL-Bref for the collection of data in this study was also sought from the World Health Organization. An informed consent was signed by either a delegated person or by the respective patient who agreed to take part in the study. Names of participants were neither written on the questionnaires themselves nor recorded in any subsequent write up.

The data collected was used for only academic and research purposes. There was no conflict of interest in this study and the research was solely funded by the principal investigator. There was a minimal level of risk associated with answering the questionnaire. Such that, participants who were emotionally disturbed or their conditions found to be deteriorating were taken to the medical director of the center for appropriate treatment. There were no direct benefits to patients who answered the questionnaire. The indirect benefit to patients associated with this study was in relation to policy guidelines that would improve upon the health of and services as well as treatment rendered to persons living with Glaucoma.

CHAPTER FOUR

RESULTS

4.1 Characteristics of study participants

From the 187 study participants described in Table 1a, their sociodemographic characteristics indicated that most of them were aged 60- 69 years (33.16%), females (55.08%), married (43.85%), had no formal education (28.34%), retired (33.16%) and received a monthly income/ support of less than GHs 1000 (78.61%). Out of the two-hundred (200) patients approached to participate in this study, one-hundred and eighty-seven (187) did agree to it. This number corresponds to a participation rate of 93.5% with all participants responding to all the questions asked.

Table 1a: Sociodemographic characteristics of study participants (N=187)

Sociodemographic factors	Freq.	Percent
Age		
25-39	10	5.35
40-49	12	6.42
50-59	28	14.97
60-69	62	33.16
70-79	55	29.41
80 & above	20	10.70
Sex		
Male	84	44.92
Female	103	55.08
Education		
No formal education	53	28.34
Primary	34	18.18
Secondary	48	25.67
Undergraduate	12	6.42
Postgraduate	40	21.39
Marital Status		
Single	8	4.28
Married	82	43.85
Divorced	22	11.76
Widowed	75	40.11
Income		
<1000	147	78.61
1001-2000	35	18.72
2001-3000	3	1.60
3001-4000	2	1.07
Occupation		
Unemployed	58	31.02
Self-employed	54	28.88
Private	6	3.21
Government	7	3.74
Retired	62	33.16

Source: Field Survey, 2018

On the medical and psychological characteristics of patients in this study, Table 1b below showed that majority of the participants had IOP levels between 22-40mmHg (64.17%), no Comorbidity (45.45%), treated with only eye drops (87.17%), experienced no side effects (92.51%) and had either moderate levels of Anxiety (48.66%) or normal levels of Depression (75.40%) with less than or equal to 10 years since being diagnosed with the disease (87.17%). About 20% of these patients recorded normal IOP levels in their eyes. Thus, a prevalence of Normal Tension Glaucoma in this study population corresponding to the above percentage. Most of the reported percentages occurred between 10 and 89%.

Table 1b: Medical and Psychological characteristics of study participants- (N=187)

Medical factors	Freq.	Percent
Years of diagnosis		
1-10	163	87.17
11-20	22	11.76
21-30	2	1.07
Initial IOP		
<22	39	20.86
22 - 40	120	64.17
>40	28	14.97
Current IOP		
<22	71	37.97
22 - 40	112	59.89
>40	4	2.14
Comorbidity		
None	85	45.45
Hypertension	84	44.92
Diabetes	10	5.35
Peptic Ulcer	3	1.60
Other	5	2.67
Treatment type		
Eye drops	163	87.17
Surgery & Eye drops	24	12.83
Side effects		
None	173	92.51
Headache	10	5.35
Blurred vision	2	1.07
Other	2	1.06
Psychological factors		
Anxiety		
Normal	33	17.65
Mild	58	31.02
Moderate	91	48.66
Severe	5	2.67
Depression		
Normal	141	75.40
Mild	37	19.79
Moderate	7	3.74
Severe	2	1.07

Source: Field Survey, 2018

4.2 Health-Related Quality of Life distribution:

The least recorded score as seen in Table 2, was 19 in the Social domain whiles the highest score was 81 in the Physical domain. The mean scores with standard deviation recorded were: Physical domain (58.99 ± 10.19), Psychological domain (52.76 ± 9.45), Social domain (59.28 ± 12.52), Environment domain (57.71 ± 10.31) and Overall Quality of Life (59.09 ± 12.60). The overall quality of life (QoL) distribution showed majority (66.85%) of patients had high/ good HRQoL scores, with a lesser percentage reporting low/ poor HRQoL scores. The mean Cronbach's alpha value (an indicator of internal consistency and reliability) was 0.79, which is an acceptable level. The Variance Inflation Factor (VIF) was below 10 thus, from 1.46 to 3.25, hence no issues of collinearity detected.

Table 2: Distribution of Health-Related Quality of Life (HRQoL) scores- (N=187)

HRQoL	Mean	SD	Min	Max
Overall HRQoL	59.09	12.60	25	75
Physical domain	58.99	10.19	25	81
Psychological domain	52.76	9.45	25	75
Social domain	59.28	12.52	19	75
Environment domain	57.71	10.31	25	75

***** (Worst possible score= 0, Best possible score= 100) Source: Field Survey, 2018

4.3 Group mean differences of independent factors with Health-Related Quality of Life

Results from the bivariate analysis in Tables 3a and 3b showed that Occupation, presence of Comorbidities and Treatment type as factors, had no significant association with the HRQoL domains of Glaucoma patients. The physical health of study participants was significantly affected by their Age ($p=0.002$), Marital Status ($p=0.047$), Initial IOP level ($p<0.001$), Final IOP level ($p<0.001$), Side Effects ($p=0.001$), Anxiety ($p<0.001$) and Depression ($p=0.001$). The psychological health of participants was significantly affected by their Sex ($p=0.019$), Initial IOP level ($p<0.001$), Final IOP level ($p=0.006$), Anxiety ($p=0.018$) and Depression $p=0.001$).

Table 3a: Mean differences of factors with the Physical and Psychological domains-(N=187)

	PHYSICAL				PSYCHOLOGICAL			
Sociodemographic	**Mean**	**SD**	**F**	**p-value**	**Mean**	**SD**	**F**	**p-value**
Age			6.63	0.002			2.56	0.080
25-39	67.00	9.30			58.20	9.40		
40-59	55.08	10.92			50.83	11.60		
60 & above	59.55	9.62			52.93	8.62		
Sex			3.80	0.053			5.57	0.019
Male	57.40	10.57			50.98	10.15		
Female	60.29	9.72			54.21	8.61		
Educational level			1.45	0.238			1.52	0.222
No formal education	60.02	9.37			51.32	9.02		
Primary/Sec	57.56	10.16			52.59	9.20		
Tertiary	60.19	10.91			54.50	10.15		
Marital status			3.12	0.047			0.74	0.480
Never married	67.25	13.93			55.38	12.35		
Currently married	57.98	9.79			51.94	8.30		
Ever married	59.17	9.97			53.24	10.12		
M. Income (GHs)			1.40	0.239			3.02	0.084
Up to 1000	58.53	9.98			52.14	9.30		
More than 1000	60.68	10.86			55.05	9.75		
Occupation			0.38	0.685			1.60	0.204
Not employed	58.41	10.20			51	8.68		
Currently working	58.64	10.38			53.13	10.24		
Retired	59.90	10.07			54.00	9.15		

Source: Field Survey, 2018

Table 3a continued

	PHYSICAL				PSYCHOLOGICAL			
Medical	**Mean**	**SD**	**F**	**p-value**	**Mean**	**SD**	**F**	**p-value**
Years of diagnosis			0.03	0.860			1.52	0.219
Up to 10	58.94	10.30			53.09	9.63		
More than	59.33	9.61			50.54	7.93		
Initial IOP (mmHg)			17.42	<0.001			25.32	<0.001
≤ 22	64.80	6.19			59.13	7.14		
> 22	57.46	10.49			51.08	9.29		
Final IOP (mmHg)			13.66	<0.001			7.81	0.006
≤ 22	62.40	8.83			55.18	9.37		
> 22	56.91	10.43			51.28	9.22		
Comorbidity?			2.98	0.086			3.87	0.051
No	57.59	10.77			51.28	9.52		
Yes	60.16	9.57			53.99	9.25		
Treatment type			0.60	0.438			0.46	0.500
Eye drops	58.77	10.64			52.94	9.58		
Drops & Surgery	60.50	6.24			51.54	8.62		
Side effects			10.88	0.001			1.29	0.257
No	59.67	9.82			52.98	9.44		
Yes	50.57	11.20			50.00	9.47		
Psychological								
Anxiety			7.81	<0.001			3.43	0.018
Normal	54.52	11.29			50.85	7.88		
Mild	61.36	9.09			54.74	9.83		
Moderate	59.92	8.77			52.764	8.68		
Severe	44.00	18.67			42.40	19.07		
Depression			5.99	0.001			5.80	0.001
Normal	60.02	9.48			53.38	8.71		
Mild	58.03	11.11			53.05	10.93		
Moderate	49.29	9.67			44.86	6.42		
Severe	38.00	0.00			31.00	0.00		

*Significance level of P-value set at <0.05 Source: Field Survey, 2018

From Table 3b, the social health of participants was affected by their Monthly income (p=0.003), Years of diagnosis (p=0.024) and Depression levels (p=0.005). Whiles the environment health of study participants was affected by their Sex (p=0.002), Education (p=0.020), Monthly income (p=0.001), Initial IOP (p=0.002), Anxiety (p=0.018) and Depression (p<0.001) of study participants. For the above variables, the observed mean difference across the groups were statistically different, hence the means are not the same across groups.

Table 3b: Mean differences of factors with the Social and Environment domains- (N=187)

	SOCIAL				ENVIRONMENT			
Sociodemographic	**Mean**	**SD**	**F**	**p-value**	**Mean**	**SD**	**F**	**p-value**
Age			0.63	0.534			2.07	0.129
25-39	61.20	11.00			62.60	11.09		
40-59	60.93	13.10			55.55	12.18		
60 & above	58.66	12.48			57.98	9.56		
Sex			0.15	0.696			9.69	0.002
Male	58.88	13.89			55.17	10.38		
Female	59.60	11.33			59.78	9.82		
Educational level			2.73	0.068			3.99	0.020
No formal education	57.09	12.39			56.79	9.84		
Primary/ Sec	58.62	12.49			56.17	10.90		
Tertiary	62.54	12.27			61.06	9.16		
Marital status			0.88	0.418			0.46	0.633
Never married	60.13	11.56			61.00	15.70		
Currently married	60.57	11.31			57.34	9.76		
Ever married	58.11	13.54			57.74	10.32		
M. Income (GHs)			9.34	0.003			12.70	0.001
≤ 1000	57.85	12.35			56.35	10.22		
> 1000	64.53	11.84			62.70	9.09		
Occupation			2.51	0.084			1.34	0.265
Not employed	56.47	13.51			56.16	10.76		
Currently working	61.43	10.94			57.64	10.89		
Retired	59.58	12.85			59.23	9.10		

Source: Field Survey, 2018

Table 3b continued

	SOCIAL				ENVIRONMENT			
	Mean	**SD**	**F**	**p-value**	**Mean**	**SD**	**F**	**p-value**
Medical								
Years of diagnosis			5.16	0.024			2.22	0.138
≤ 10	60.07	12.42			58.14	10.01		
> 10	53.92	12.11			54.79	11.94		
Initial IOP (mmHg)			2.35	0.127			10.44	0.002
< 22	62.00	10.54			62.33	8.55		
≥ 22	58.56	12.93			56.49	10.41		
Final IOP (mmHg)			0.04	0.841			3.05	0.082
< 22	59.04	11.88			59.38	10.06		
≥ 22	59.42	12.95			56.68	10.37		
Comorbidity?			2.33	0.129			2.62	0.108
No	57.75	12.69			56.38	10.79		
Yes	60.55	12.29			58.81	9.80		
Treatment type			<0.001	0.949			0.08	0.785
Eye drops	59.30	12.31			57.79	10.25		
Drops & Surgery	59.13	14.14			57.17	10.91		
Side effects			0.75	0.387			1.04	0.308
No	59.05	12.54			57.93	9.94		
Yes	62.07	12.36			55.00	14.33		
Psychological								
Anxiety			1.83	0.143			3.43	0.018
Normal	59.94	10.45			60.91	9.84		
Mild	60.76	12.01			58.00	10.97		
Moderate	58.74	13.04			56.99	9.23		
Severe	47.60	17.98			46.20	16.45		
Depression			4.39	0.005			13.31	<0.001
Normal	59.64	11.82			59.21	8.93		
Mild	61.32	13.33			56.38	10.93		
Moderate	45.57	14.41			42.00	11.21		
Severe	44.00	0.00			31.00	0.00		

*Significance level of P-value set at <0.05 Source: Field Survey, 2018

The significant factors identified in the tables above were, Sociodemographic: Age, Sex, Education, Marital status and Income; Medical: Years of diagnosis, Initial IOP level, Final IOP level and Side effects; Psychological/ mental health: Anxiety and Depression.

4.4 Factors associated with the domains of Health-Related Quality of Life (HRQoL)

4.4.1 Physical domain:

Sociodemographic:

Marital status showed a negative correlation (p=0.021) with the physical domain of HRQoL when all other variables were held constant. Thus, compared to those who were single/ never married, the mean physical health score of patients decreased by 9.59 (95%CI: -18.52, -0.67) for those who were either divorced or widowed and by 11.34 (95%CI: -20.02, 2.66) for those who were currently married. Age did not correlate with this domain.

Medical:

Initial IOP levels was also negatively correlated with the physical domain of HRQoL when all other variables were (adjusted) held constant. Thus, compared to those with normal (<22mmHg) IOP levels, the mean physical health score decreased by 5.18 (95%CI: -8.44, -1.91) for patients with high (≥ 22mmHg) IOP levels. This relationship was statistically significant (p=0.002).

Side effects as a variable was negatively correlated (p=0.005) with the physical domain of HRQoL when all other variables were (adjusted) held constant. Thus, compared to those with no side effects, the mean physical health score decreased by 7.01 (95%CI: -11.88, -2.15) for patients with side effects. Final IOP levels did not correlate with this domain.

Psychological:

Anxiety showed a decreasing correlation towards the negative with the physical domain of HRQoL when all other variables were held constant. Thus, compared to those who had normal anxiety levels, the mean physical health score of patients increased by 5.21 (95%CI: 1.50, 8.91) for mild levels, by 5.11 (95%CI: 1.56, 8.67) for moderate levels and decreased by 5.44 (95%CI: -14.13, 3.25) for severe levels. This association was statistically significant (p=0.002).

Depression showed a negative correlation (p<0.001) with the physical domain of HRQoL when all other variables were held constant. Thus, compared to those who had normal depression levels, the mean physical health score of patients decreased by 2.49 (95%CI: -5.75, 0.77) for mild levels, 10.26 (95%CI: -16.75, -3.78) for moderate levels and 20.72 (95%CI: -34.12, -7.32) for severe levels (Table 4a).

Table 4a: Factors associated with the Physical domain- (N=187)

	CRUDE				ADJUSTED			
	β	(95% CI)		*P>|t|	β	(95% CI)		*P>|t| <0.001
Age				0.002				0.212
25-39	11.93	5.03	18.82		4.02	-3.66	11.70	
40-59	0.00				0.00			
60 & above	4.47	0.97	7.98		2.62	-0.58	5.82	
Marital Status				0.047				0.021
Never married	0.00				0.00			
Currently married	-9.27	-16.64	-1.91		-11.34	-20.02	-2.66	
Ever married	-8.09	-15.39	-0.78		-9.59	-18.52	-0.67	
Initial IOP				<0.001				0.002
< 22	0.00				0.00			
≥ 22	-7.34	-10.81	-3.87		-5.18	-8.44	-1.91	
Final IOP				<0.001				0.054
< 22	0.00				0.00			
≥ 22	-5.49	-8.42	-2.56		-2.69	-5.42	0.04	
Side effects				0.001				0.005
No	0.00				0.00			
Yes	-9.10	-14.54	-3.66		-7.01	-11.88	-2.15	
Anxiety				<0.001				0.002
Normal	0.00				0.00			
Mild	6.85	2.69	11.01		5.21	1.50	8.91	
Moderate	5.41	1.53	9.28		5.11	1.56	8.67	
Severe	-10.52	-19.67	-1.363		-5.44	-14.13	3.25	
Depression				0.001				<0.001
Normal	0.00				0.00			
Mild	-1.99	-5.57	1.58		-2.49	-5.75	0.77	
Moderate	-10.74	-18.22	-3.25		-10.26	-16.75	-3.78	
Severe	-22.02	-35.79	-8.25		-20.72	-34.12	-7.32	

*Significance level of P-value set at <0.05 Source: Field Survey, 2018

4.4.2 Psychological domain:

Sociodemographic:

Sex showed a positive correlation with the psychological domain of HRQoL when all other variables were held constant. Thus, compared to males, the mean psychological health score of patients increased by 2.54 (95%CI: 0.12, 4.97) for female patients. This association was statistically significant (p=0.040).

Medical:

Initial IOP levels was also negatively correlated with the psychological domain of HRQoL when all other variables were (adjusted) held constant. Thus, compared to those with normal (<22mmHg) IOP levels, the mean psychological health score decreased by 6.63 (95%CI: -9.82, -3.45) for patients with high (≥ 22mmHg) IOP levels. This relationship was statistically significant (p<0.001). Final IOP levels did not correlate with this domain.

Psychological:

Depression showed a negative correlation with the psychological domain of HRQoL when all other variables were held constant. Thus, compared to those who had normal depression levels, the mean psychological health score of patients decreased by 1.29 (95%CI: -4.46, 1.88) for mild levels, 7.80 (95%CI: -14.18, -1.42) for moderate levels and 19.36 (95%CI: -31.81, -6.90) for severe levels. This association was statistically significant (p=0.003). Anxiety did not correlate with this domain of HRQoL as shown in Table 4b.

Table 4b: Factors associated with the Psychological domain- (N=187)

	CRUDE				ADJUSTED			
	β	(95% CI)		*P>|t|	β	(95% CI)		*P>|t|
Sex				0.019				0.040
Male	0.00				0.00			
Female	3.24	0.53	5.95		2.54	0.12	4.97	
Initial IOP				<0.001				<0.001
< 22	0.00				0.00			
≥ 22	-8.05	-11.20	-4.89		-6.63	-9.82	-3.45	
Final IOP				0.006				0.298
< 22	0.00				0.00			
≥ 22	-3.91	-6.67	-1.15		-1.42	-4.09	1.26	
Anxiety				0.018				0.100
Normal	0.00				0.00			
Mild	3.89	-0.09	7.88		3.98	0.36	7.60	
Moderate	1.91	-1.81	5.63		3.43	0.01	6.85	
Severe	-8.45	-17.22	0.33		-1.02	-9.75	7.71	
Depression				0.001				0.003
Normal	0.00				0.00			
Mild	-0.33	-3.65	2.99		-1.29	-4.46	1.88	
Moderate	-8.53	-15.48	-1.57		-7.80	-14.18	-1.40	
Severe	-22.38	-35.17	-9.59		-19.4	-31.81	-6.90	

*Significance level of P-value set at <0.05 Source: Field Survey, 2018

4.4.3 Social domain:

Sociodemographic:

Income showed a positive correlation with the social domain of HRQoL when all other variables were held constant. Thus, compared to patients who received less than GHs 1000 as monthly income, the mean social health score of patients increased by 6.18 (95%CI: 2.01, 10.36) for those receiving more than GHs 1000 as monthly income. This association was statistically significant (p=0.004).

Medical:

Years of/ time elapsed since disease diagnosis was negatively correlated with the social domain of HRQoL when all other variables were (adjusted) held constant. Thus, compared to those with less than 10 years, the mean social health score decreased by 5.60 (95%CI: -10.89, -0.31) for patients with more than 10 years of disease diagnosis. This relationship was statistically significant (p=0.038).

Psychological:

Depression showed a negative correlation with the social domain of HRQoL when all other variables were held constant. Thus, compared to those who had normal depression levels, the mean social health score of patients increased by 2.38 (95%CI: -2.02, 6.78) for mild levels, and decreased by 11.71 (95%CI: -20.94, -2.48) for moderate levels and 14.80 (95%CI: -31.47, 1.87) for severe levels. This association was statistically significant (p=0.012). These relationships are shown in Table 4c.

Table 4c: Factors associated with the Social domain- (N=187)

	CRUDE				ADJUSTED			
	β	**(95% CI)**		***P>|t|**	**β**	**(95% CI)**		***P>|t|** <0.001
Income				0.003				0.004
≤ 1000	0.00				0.00			
> 1000	6.68	2.37	10.98		6.18	2.01	10.36	
Years				0.024				0.038
≤ 10	0.00				0.00			
> 10	-6.15	-11.49	-0.81		-5.60	-10.89	-0.31	
Depression				0.005				0.012
Normal	0.00				0.00			
Mild	1.69	-2.76	6.13		2.38	-2.02	6.78	
Moderate	-14.07	-23.38	-4.75		-11.71	-20.94	-2.48	
Severe	-15.64	-32.77	1.49		-14.80	-31.47	1.87	

*Significance level of P-value set at <0.05 Source: Field Survey, 2018

4.4.4 Environment domain:

Sociodemographic:

Sex showed a positive correlation with the environment domain of HRQoL when all other variables were held constant. Thus, compared to males, the mean environmental health score of patients increased by 4.66 (95%CI: 2.09, 7.23) for female patients. This association was statistically significant ($p<0.001$).

Income showed a positive correlation with the environment domain of HRQoL when all other variables were held constant. Thus, compared to patients who received less than GHs 1000 as monthly income, the mean environmental health score of patients increased by 4.78 (95%CI: 1.08, 8.48) for those receiving more than GHs 1000 as monthly income. This association was statistically significant ($p=0.012$). Education did not correlate with this domain.

Medical:

Initial IOP levels was negatively correlated with the environment domain of HRQoL when all other variables were (adjusted) held constant. Thus, compared to those with normal (<22mmHg) IOP levels, the mean environmental health score decreased by 4.63 (95%CI: -7.68, -1.57) for patients with high (≥ 22mmHg) IOP levels. This relationship was statistically significant ($p=0.003$).

Psychological:

Depression showed a negative correlation with the environment domain of HRQoL when all other variables were held constant. Thus, compared to those who had normal depression levels, the mean environmental health score of patients decreased by 3.15 (95%CI: -6.43, 0.14) for mild levels, 15.99 (95%CI: -22.55, -9.43) for moderate levels and 23.77 (95%CI: -36.57, -10.96) for

severe levels. This association was statistically significant (p<0.001). Anxiety did not correlate with this domain (Table 4d).

Table 4d: Factors associated with the Environment domain- (N=187)

	CRUDE				ADJUSTED			
	β	**(95% CI)**		***P>|t|**	**β**	**(95% CI)**		***P>|t|** <0.001
Sex				0.002				<0.001
Male	0.00				0.00			
Female	4.61	1.69	7.53		4.66	2.09	7.23	
Education				0.020				0.445
No formal education	0.00				0.00			
Primary/ Sec	-0.62	-4.15	2.91		-1.27	-4.43	1.90	
Tertiary	4.27	0.36	8.17		0.82	-3.25	4.89	
Income				0.001				0.012
≤ 1000	0.00				0.00			
> 1000	6.35	2.84	9.87		4.78	1.08	8.48	
Initial IOP				0.002				0.003
< 22	0.00				0.00			
≥ 22	-5.85	-9.42	-2.28		-4.63	-7.68	-1.57	
Anxiety				0.018				0.627
Normal	0.00				0.00			
Mild	-2.91	-7.26	1.44		-1.71	-5.44	2.02	
Moderate	-3.92	-7.97	0.13		-0.77	-4.38	2.84	
Severe	-14.71	-24.28	-5.14		-4.95	-13.88	3.99	
Depression				<0.001				<0.001
Normal	0.00				0.00			
Mild	-2.83	-6.27	0.60		-3.15	-6.43	0.14	
Moderate	-17.21	-24.41	-10.02		-15.99	-22.55	-9.43	
Severe	-28.21	-41.44	-14.99		-23.77	-36.57	-10.96	

*Significance level of P-value set at <0.05 Source: Field Survey, 2018

4.5 Factors associated with Overall Health-Related Quality of Life (HRQoL)

Medical:

Initial IOP levels was significantly associated with the overall HRQoL of glaucoma patients when all other variables were (adjusted) held constant. Thus, the odds of glaucoma patients with high (≥ 22mmHg) initial IOP levels having good overall HRQoL scores is 0.34 (95%CI: 0.16, 0.73) times greater, compared to those with normal (<22mmHg) initial IOP levels. This relationship is statistically significant (p=0.005).

Final IOP levels was also significantly associated with the overall HRQoL of glaucoma patients when all other variables were (adjusted) held constant. Thus, the odds of glaucoma patients with high (≥ 22mmHg) current IOP levels having good overall HRQoL scores is 0.49 (95%CI: 0.26, 0.91) times greater, compared to those with normal (<22mmHg) current IOP levels. This relationship is statistically significant (p=0.025). All the sociodemographic and psychological variables as well as Side effects and Years (duration) of diagnosis were not associated with the overall HRQoL as seen in Tables 5a and 5b below.

Table 5a: Sociodemographic factors associated with Overall HRQoL- (N=187)

	CRUDE				ADJUSTED			
Sociodemographic	**OR**	**(95% CI)**		***P>|z|**	**OR**	**(95% CI)**		***P>|z|**
Age				0.354				0.563
25-39	2.35	0.57	9.68		0.61	0.09	4.08	
40-59	1.00				1.00			
60 & above	1.51	0.78	2.96		1.37	0.65	2.88	
Sex				0.024				0.075
Male	1.00				1.00			
Female	1.85	1.08	3.17		1.70	0.95	3.05	
Education				0.762				0.741
No education	1.00				1.00			
Primary/ Sec	1.24	0.66	2.33		1.29	0.65	2.59	
Tertiary	1.25	0.62	2.55		1.34	0.53	3.38	
Marital Status				0.218				0.193
Never married	1.00				1.00			
Currently married	0.31	0.07	1.45		0.18	0.02	1.59	
Ever married	0.44	0.10	2.00		0.26	0.03	2.37	
Income				0.302				0.321
≤ 1000	1.00				1.00			
> 1000	1.42	0.73	2.77		1.53	0.66	3.56	

*Significance level of P-value set at <0.05 Model p-value, p<0.001 Source: Field Survey, 2018

Table 5b: Medical and Psychological factors associated with Overall HRQoL- (N=187)

	CRUDE				ADJUSTED			
	OR	(95% CI)		*P>|z|	OR	(95% CI)		*P>|z|
Medical								
Years of diagnosis				0.091				0.072
≤ 10	1.00				1.00			
> 10	2.02	0.90	4.57		2.32	0.93	5.80	
Initial IOP				<0.001				0.005
< 22	1.00				1.00			
≥ 22	0.25	0.13	0.49		0.34	0.16	0.73	
Final IOP				<0.001				0.025
< 22	1.00	0.00	0.00		1.00			
≥ 22	0.35	0.20	0.62		0.49	0.26	0.91	
Side effects				0.138				0.403
No	1.00				1.00			
Yes	0.45	0.16	1.28		0.62	0.20	1.90	
Psychological								
Anxiety				0.031				0.367
Normal	1.00				1.00			
Mild	2.07	0.92	4.68		1.74	0.75	4.04	
Moderate	1.09	0.53	2.28		1.09	0.48	2.46	
Severe	0.21	0.03	1.35		0.43	0.04	4.54	
Depression				0.036				0.123
Normal	1.00				1.00			
Mild	1.20	0.58	2.45		0.93	0.42	2.02	
Moderate	0.22	0.05	1.06		0.21	0.04	1.06	
Severe	0.05	0.00	0.76		0.06	0.00	2.13	

*Significance level of P-value set at <0.05

Source: Field Survey, 2018

CHAPTER FIVE

DISCUSSIONS

5.1 Main findings of the study

This study evaluated the HRQoL perceived by Glaucoma patients who sought care at the Emmanuel Eye Medical Center in Accra, to assess its associated factors. Sociodemographic (Age, Sex, Education, Marital status, Income, Occupation), Medical (Comorbidities, Treatment type, Side effects, IOP levels, Years of diagnosis) and Psychological (Anxiety, Depression) factors were the independent variables assessed in this study. Of these factors, Marital status, Initial IOP levels, Side effects, Anxiety and Depression were significantly associated with the physical domain of HRQoL, whiles Sex, Initial IOP levels and Depression were associated with the psychological domain of HRQoL.

Income, Years of diagnosis and Depression were factors associated with the social domain whiles Sex, Income, Initial IOP levels and Depression levels were significantly associated with the environment domain of patients' HRQoL. The Initial and Final IOP levels were associated with the overall HRQoL. Of the HRQoL scores reported, majority (66.85%) of the patients had high (good) HRQoL scores with a lesser percentage reporting lower HRQoL scores. The mean scores reported were: Physical (58.99 ± 10.19); Psychological (52.76 ± 9.45); Social (59.28 ± 12.52); Environment (57.71 ± 10.31); and Overall HRQoL (59.09 ± 12.60).

5.2 Contextual analysis and Comparison with other studies

5.2.1 Background characteristics

The general characteristics of the population found in this study, such as the predominance of women and low education were similar to other studies conducted elsewhere. With patients aged 60-79 years being the most prevalent age categories in this study, the assertion and findings by Pambo, (2012) that with time the greater percentages of Glaucoma patients will be in the elderly generation, is clearly supported. This might be due to an aging population, thus increasing life expectancy or because of poor blood flow through the optic nerves.

Majority of females participated in this study than males, supporting the prior evidence given in country census that there are more females than males in the country (GSS, 2012). This may also be because of reduced utilization and assess to eye services by males in developing countries. These findings contradict a study conducted in Nigeria by Olusanya et al, (2012). In Olusanya et al. study, 65.8% of the low vision patients were males with male to female ratio of 1.9:1. Findings from the study were similar to that in a study by Elliot et al, (1997) where there were more females (60.65%) compared to males (39.35%) in Ontario, Canada. The observed difference may be due in part to the longevity of female participants in these studies or also due to the statistically prevailing male to female ratio in the sampled countries.

Majority of respondents in this study were either with no or little formal educational background which was consistent with the literacy rates in the country (GSS, 2012). It was also shown that all patients across the educational categorization had a good health-seeking behavior. Here, irrespective of how educated persons were, some form of treatment regimen was being sought by the patients regarding the disease Glaucoma (GSS, 2012). The lower middle-income status and

categorization of the country was also shown in this study in that majority of the patients received a monthly income/ support of less than GHs 1000. This was further corroborated by the high proportion of current non-workers (either unemployed or retired) participating in this study. But the average monthly income of participants in this study was tentatively above the current minimum daily-GHs 9.60 (Yakah, 2018) and monthly-GHs 288 wage for the country. The high percentages seen in the education, income level and employment type of participants was a little out of the ordinary since the location and non-governmental status of the study site is usually expected to attract mostly employed, high-earning and highly educated patients.

Most participants were either married or divorced which was consistent with the prevailing age categories within this study. Previous census conducted in the country showed most of the populace being Christians (GSS, 2012), a finding which was supported by this study in its 8:1 ratio of Christians as compared to Muslims. Since majority of the participants were between 60 and 80 years, a huge proportion of patients having less than 10 years of disease diagnosis could be attributed to either a late onset or diagnosis of the condition. Since eye drops- first line of therapy- are the cheapest form of treatment available to glaucoma patients and that most participants in this study earned less than GHs 1000, it is not surprising that most patients are using eye drops. This observation in the study further showed why most of the intraocular pressure (IOP) levels recorded in this study was between 22-40mmHg, very indicative of Glaucoma as a prevailing chronic condition.

Partly similar to the study by Lin et al, (2010), Hypertension was presented as the most prevalent comorbidity aside those without any form of comorbidity. Since other types of treatment were very expensive, the prevalence of eye drops as the treatment option for patients in this study could be partly attributed to cost, in that most of the participants received less than GHs 1000 a

month and were currently out of work. Having little to no side effects from this treatment option by patients in this study, did show a possible compatibility of ophthalmic medication with the biological composition of participants in the study. Even though majority of the participants were either currently not working or receiving a monthly support of less than GHs 1000, severe levels of anxiety and depression was not the most found to be at very low levels in patients.

5.2.2 Health-Related Quality of Life (HRQoL) scores

The mean HRQOL as seen in the domains and as well as the overall HRQOL was lower than those reported by other authors (Browne et al, 2012) (Gupta et al, 2011). However, the domain-specific HRQOL pattern was like that of other African-based studies (Kyari et al, 2013), with the social domain being the highest whiles the psychological domain had the least mean score, probably because most participants live in communities that are located in areas of greater social support/ robustness. The dominance of the social domain is further indicative of the good extended (family) social networking system and support available in the country. As this is inculcated into the culture of the average Ghanaian, such a culture informs the general society which in turn influences the social health of both Glaucoma patients and the general populace. The overall HRQoL was also consistent with this domain's mean scores. The least mean scores recorded in the psychological domain is also indicative of the lack of a better mental health system (resources, planning, policies and legislation, data, human resource and facilities) existing currently in the country.

5.2.3 Factors associated with HRQoL scores

5.2.3.1 Sociodemographic factors:

Findings from this study showed that sex did significantly affect the overall HRQoL as well as the psychological and environment domains of HRQoL. Thus, females had significantly higher HRQoL scores than males in psychological and environmental health. This finding, however, contradicts that conducted by Tesfay et al, (2015) in Ethiopia and Mafirakureva et al, (2016). It further contradicted the findings of Degroote et al, (2014) who associated lower HRQoL in women to increased reproductive health worries. The observed difference in comparison with these studies can be accounted for the female to male ratios existing in the countries of these studies (Bawn, 2018). It can also be due to greater longevity for women in Ghana compared to the countries of the other researches. Income level was a positive predictor of HRQoL in the social and environment health domains, thus, as monthly income/ support levels increased the HRQoL of patients also increased. This was attributable to the socioeconomic status of the patients themselves, their support groups and the environment in which they live. The findings corroborated that of Mafirakureva et al, (2016) who associated increased income with increased HRQoL. Since income affects the social structure and welfare system being offered by our societies, it goes to confirm the association of income to the social and environment domains of the HRQoL. Income and sex showed similar patterns regarding HRQOL. Since inequalities in income distribution by sex exists in the country, it is therefore not surprising that such results were obtained in this study. A significant influencing factor in the physical health domain of patients in this study was their marital status, where being married, divorced or widowed was negatively associated with HRQoL. A probable cause of this was that most of the married, divorced or widowed patients in the study were between the ages of 60 and 80 years, a period

marked by significant reduction in retirement from work, physical inactivity and reduced physical strength. Thus, being married or widowed in this study reduced the HRQoL of patients compared to those who were single. This finding contradicts that of Bello & Bello, (2013) where married people were found to have better HRQoL than the unmarried due to the support they were receiving from their spouses.

5.2.3.2 Medical factors:

The IOP at the time of diagnosis (Initial IOP) was negatively associated with the overall, physical, psychological and environmental health of patients in this study. Thus, as initial IOP levels decreased, their HRQoL scores did increase. This was further seen with the current IOP levels which followed similar trend in the overall HRQoL. This was an expected finding as IOP was initially stated as the most significant predictor of overall HRQoL. The finding was also consistent with other studies in this area and that stated by Challa, 2008. There was however, no association between HRQOL and treatment type (pharmacological treatment), a contradiction to the negative association espoused by Almeida-Brasil et al, (2017). This could be due to the different genetic composition, environmental and socioeconomic conditions of participants in both studies. The findings from Weinreb & Kaufman, (2009) and Guedes et al, (2013), that there was little to no difference in impact of the treatment types on HRQoL, was supported by this study. The presence of a treatment side effect was negatively associated with the physical domain of patients. This finding is not a deviation from the expected as seen in Street et al, (2009). This may be expected because side effects, which adds on to the physical strain of Glaucoma as a chronic condition, reduces the strength of patients and limit their ability to perform daily activities thereby reducing their physical health status.

The duration of diagnosis (Glaucoma) in patients was also associated negatively with the social HRQoL, in that as the duration progressed HRQoL scores were reduced. This is attributable to the fact that as the disease (Glaucoma) progresses, more optic nerves are lost or become weaker, greater amount of money is spent in treatment efforts since there is no cure and more patients feel a drain in their ability to be involved in social activities which inevitably reduces their HRQoL scores. It has a possible relation to sedentary lifestyles associated with poor individual health. Similar finding was also observed in a study conducted by Whigham et al, (2018), where overall HRQoL showed significant associations with how long a patient had lived with/ been diagnosed with the disease. Thus, the greater the years of disease diagnosis, the lesser the associated HRQoL score of patients.

5.2.3.3 Psychological factors:

Low levels of anxiety were associated negatively with the physical health of participants in this study, a finding which was similar to that of Degroote et al, (2014). Depression was negatively associated with the physical, psychological, social and environmental health of participants in this study, such that increased levels of depression decreased their HRQoL scores in the physical, psychological, social and environment domains. This supported the findings of Briongos Figuero et al, (2011) and Degroote et al, (2014) where decreased depression levels were associated with increased HRQoL scores and vice-versa.

5.3 Methodological Validity

A number of strengths are associated with this study in that it offers the first kind of insight into the Health-Related Quality of Life among Glaucoma patients at the Emmanuel Eye Medical Center and possibly within the country. It is also a cross-sectional study involving one-hundred

and eighty-seven (187) patients in a referral center which caters for and is relevant to a greater proportion of patients across the Greater Accra Region who use the study site. With a very high participation rate (93.5%), the possibility of selection bias which could have affected this study, due to the use of patients' medical records, is minimized. The sample size calculation was adjusted in order to increase the power of this study. Also, the dependent variable was assessed objectively and was in no way related to the independent variables. A major limitation to this study is that, since this is a cross-sectional study, the reported results should be carefully interpreted due to the complexities associated with establishing causal relationships. Another limitation was that the questionnaire used is a self-reporting one and as such subject to responses which might be distorted from socially unacceptable answers towards more desirable ones. However, the WHOQOL-Bref is a widely accepted HRQoL tool with enough psychometric properties approved by the WHO. During data analysis, the limitation of possible confounders which could have influenced the associations identified were adjusted for to control their effects. To account for the possibility limitation of recall bias, which is usually prone to this kind of study as a result of the kind of information being sought from participants, a reduced recall period of only four weeks was used. Also, this study did not consider patients receiving care at other referral centers.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The study involved 187 Glaucoma patients receiving care at the Emmanuel Eye Medical Center. The study identified the domain-specific and overall health-related quality of life of Glaucoma patients. The factors influencing the health-related quality of life of patients were identified. It showed that the HRQoL of Glaucoma patients were influenced significantly by sociodemographic, medical and psychological factors in different ways. The association of the sociodemographic factors with patients' HRQoL was largely positive whiles that of the medical factors was negative. Similarly, the psychological factors did influence patients' HRQoL negatively. Thus, the HRQoL among Glaucoma patients did differ in direction of effect by the associated factor. This study also elaborated the relevance of actions to improve HRQoL in Glaucoma patients. From the findings of this study, it was observed that the sociodemographic, medical and psychological factors had significantly different (did not have the same) effects on the health-related quality of life of Glaucoma, hence the stated hypothesis was rejected.

6.2 Recommendations

From the findings of this study, the following recommendations are being made:

It is recommended that further strengthening and encouraging social support should be done regarding Glaucoma patients, since the mean overall HRQoL was similar to that of the social domain. Thus, investments can be made by civil society organizations into planning policies aimed at improving the health status of people living with chronic diseases.

The low mean psychological health scores of participants necessitate the need for family and friends of the patients to provide the necessary environment, counselling and support needed to better improve their general health. This can lead to a decrease in depression levels of patients.

It is recommended that medical professionals establish lasting and cordial relationships through effective communication with their patients, since this might serve as a motivating factor for these patients in adhering to their medications for a long time.

There is also the need for early treatment (encompassing the relevant sociodemographic, medical and psychological issues) aimed at reducing the effect of IOP levels and years of diagnosis on the health status of Glaucoma patients.

It is recommended that the center (study site) together with other relevant stakeholders advocate for an increase in the number of relevant eye drops listed on the National Health Insurance Scheme. This might reduce the likelihood of blindness, normalize the IOP levels of patients and increase their health status.

The negative influence of side effects can be addressed by authorities of the health facility through assessing a patient's tolerability for ophthalmic treatments before giving medications to them, to enable a reduction in their treatment complications experienced.

From the estimation of health state (mean overall health-related quality of life) for glaucoma patients receiving care at the Emmanuel Eye Medical Center, subsequent studies can assess the associated quality-adjusted life years (QALYs) which is relevant in the economic evaluations of topical therapeutic interventions.

It is also recommended that further studies on Glaucoma patients receiving care at other referral centers within the country be conducted to have a national estimate of their HRQoL.

REFERENCES

Ababio, G.K., Bosomprah, S., Olumide, A., Aperkor, N., Aimakhu, C., Oteng-Yeboah, A., Agama, J., Chaplin, W.F., Okuyemi, K.S., Amoah, A.G.B., Ogedegbe, G. (2017). Predictors of quality of life in patients with diabetes mellitus in two tertiary health institutions in Ghana and Nigeria. Niger Postgrad Med J. 24(1):48-55. doi: 10.4103/npmj.npmj_3_17.

Alexopoulos, N., Katritsis, D., & Raggi, P. (2014). Visceral adipose tissue as a source of inflammation and promoter of atherosclerosis. *Atherosclerosis*, *233*(1), 104-112.

Almeida-Brasil, C. C., Silveira, M. R., Silva, K. R., Lima, M. G., Faria, C. D. C. D. M., Cardoso, C. L., & Ceccato, M. D. G. B. (2017). Qualidade de vida e características associadas: aplicação do WHOQOL-BREF no contexto da Atenção Primária à Saúde. *Ciência & Saúde Coletiva*, *22*, 1705-1716.

Álvarez, A. S., Pagani, M., & Meucci, P. (2012). The clinical application of the biopsychosocial model in mental health: a research critique. *American journal of physical medicine & rehabilitation*, *91*(13), S173-S180.

Ankomah, A., Ganle, J. K., Lartey, M. Y., Kwara, A., Nortey, P. A., Okyerefo, M. P. K., & Laar, A. K. (2016). ART access-related barriers faced by HIV-positive persons linked to care in southern Ghana: a mixed method study. *BMC infectious diseases*, *16*(1), 738.

Anum, P.O., Anto, B.P., Forson, A.G. (2017). Structured pharmaceutical care improves the health-related quality of life of patients with asthma. J Pharm Policy Pract. 7;10:8. doi: 10.1186/s40545-017-0097-7.

Aspinall, P. A., Johnson, Z. K., Azuara-Blanco, A., Montarzino, A., Brice, R., & Vickers, A. (2008). Evaluation of quality of life and priorities of patients with glaucoma. *Investigative ophthalmology & visual science*, *49*(5), 1907-1915.

Bahadoran, P., & Mohamadirizi, S. (2015). Relationship between physical activity and quality of life in pregnant women. *Iranian journal of nursing and midwifery research*, *20*(2), 282.

Bani-Issa, W. (2011). Evaluation of the health-related quality of life of Emirati people with diabetes: integration of sociodemographic and disease-related variables. *Eastern Mediterranean health journal*, *17*(11).

Bawn, M. (2018). Ethnic Considerations for Glaucoma: A Review. Retrieved 24th September 2018 from https://www.preprints.org/manuscript/201809.0418/download/final_file

Browne, C., Brazier, J., Carlton, J., Alavi, Y., & Jofre-Bonet, M. (2012). Estimating quality-adjusted life years from patient-reported visual functioning. *Eye*, *26*(10), 1295.

Budenz, D. L., Barton, K., Whiteside-de Vos, J., Schiffman, J., Bandi, J., Nolan, W., & Tema Eye Survey Study Group. (2013). Prevalence of glaucoma in an urban West African population: the Tema Eye Survey. *JAMA ophthalmology*, *131*(5), 651-658.

Busija, L., Pausenberger, E., Haines, T. P., Haymes, S., Buchbinder, R., & Osborne, R. H. (2011). Adult measures of general health and health- related quality of life: Medical Outcomes Study Short Form 36- Item (SF- 36) and Short Form 12- Item (SF- 12) Health Surveys, Nottingham Health Profile (NHP), Sickness Impact Profile (SIP), Medical Outcomes Study Short Form 6D (SF- 6D), Health Utilities Index Mark 3 (HUI3), Quality of Well- Being Scale (QWB), and Assessment of Quality of Life (AQOL). *Arthritis care & research*, *63*(S11), S383-S412.

Caqueo-Urízar, A., Gutiérrez-Maldonado, J., & Miranda-Castillo, C. (2009). Quality of life in caregivers of patients with schizophrenia: a literature review. *Health and quality of life outcomes*, *7*(1), 84.

Cedrone, C., Mancino, R., Cerulli, A., Cesareo, M., & Nucci, C. (2008). Epidemiology of primary glaucoma: prevalence, incidence, and blinding effects. *Progress in brain research*, *173*, 3-14.

Chrystyn, H., Small, M., Milligan, G., Higgins, V., Gil, E. G., & Estruch, J. (2014). Impact of patients' satisfaction with their inhalers on treatment compliance and health status in COPD. *Respiratory medicine*, *108*(2), 358-365.

Cohen, J., Brown, Clark S. (2010). John Romano and George Engel: Their Lives and Work. University of Rochester Press, Rochester, NY, and Boydell and Brewer Limited, Suffolk UK.

Co-morbidity. (n.d.) *Farlex Partner Medical Dictionary*. (2012). Retrieved 14th November 2017, from https://medical-dictionary.thefreedictionary.com/co-morbidity.

Curro, F. A., & Gillam, D. G. (2015). Challenging the traditional approach for the conduct of dentine hypersensitivity studies: person-centric studies connecting the patient with their practitioner to optimise the clinical outcome. In *Dentine Hypersensitivity* (pp. 85-99). Springer, Cham.

Degroote, S., Vogelaers, D., & Vandijck, D. M. (2014). What determines health-related quality of life among people living with HIV: An updated review of the literature. Archives of Public Health, 72, 1–10. https://doi.org/10.1186/2049-3258-72-40

Diekmann, H., & Fischer, D. (2013). Glaucoma and optic nerve repair. *Cell and tissue research*, *353*(2), 327-337.

Donkor, E. S., Owolabi, M. O., Bampoh, P. O., Amoo, P. K., Aspelund, T., & Gudnason, V. (2014). Profile and health-related quality of life of Ghanaian stroke survivors. *Clinical interventions in aging*, *9*, 1701.

Dwamena, F., Holmes- Rovner, M., Gaulden, C. M., Jorgenson, S., Sadigh, G., Sikorskii, A., & Beasley, M. (2012). Interventions for providers to promote a patient- centred approach in clinical consultations. *Cochrane database of systematic reviews*, (12).

Fava, G. A., & Sonino, N. (2008). The biopsychosocial model thirty years later. *Psychotherapy and psychosomatics*, *77*(1), 1-2.

Fayers, P. M., & Machin, D. (2013). *Quality of life: the assessment, analysis and interpretation of patient-reported outcomes*. John Wiley & Sons.

Fea, Antonio Maria, Hengerer, Fritz, Lavia, Carlo, and Au, Leon. (2017). Glaucoma Quality of Life. Hindawi Journal of Ophthalmology. Volume 2017, Article ID: 4257151, https://doi.org/10.1155/2017/4257151

Feder, K., Michaud, D. S., Keith, S. E., Voicescu, S. A., Marro, L., Than, J., & Whelan, C. (2015). An assessment of quality of life using the WHOQOL-BREF among participants living in the vicinity of wind turbines. *Environmental research*, *142*, 227-238.

Gessesse, G. W., & Damji, K. F. (2013). Advanced glaucoma: management pearls. *Middle East African journal of ophthalmology*, *20*(2), 131.

Ghaemi, S. N. (2009). The rise and fall of the biopsychosocial model. *The British Journal of Psychiatry*, *195*(1), 3-4.

Glaucoma. A.D.A.M. Medical Encyclopedia. (2013). Retrieved 19th February 2018 from http://aia5.adam.com/content.aspx?productId=117&pid=1&gid=001620,

Goldberg, I., Clement, C. I., Chiang, T. H., Walt, J. G., Lee, L. J., Graham, S., & Healey, P. R. (2009). Assessing quality of life in patients with glaucoma using the Glaucoma Quality of Life-15 (GQL-15) questionnaire. *Journal of glaucoma*, *18*(1), 6-12.

Greene, J., & Hibbard, J. H. (2012). Why does patient activation matter? An examination of the relationships between patient activation and health-related outcomes. *Journal of general internal medicine*, *27*(5), 520-526.

GSS. (2012). 2010 population and housing census: summary report of final results. Retrieved 24th September 2018 from http://www.statsghana.gov.gh/docfiles/2010phc/Census2010_Summary_report_of_final_results.pdf

Guedes, R. A. P., Guedes, V. M. P., Freitas, S. M., & Chaoubah, A. (2013). Quality of life of medically versus surgically treated glaucoma patients. *Journal of glaucoma*, *22*(5), 369-373.

Gupta, V., Dutta, P., Mary, O. V., Kapoor, K. S., Sihota, R., & Kumar, G. (2011). Effect of glaucoma on the quality of life of young patients. *Investigative ophthalmology & visual science*, *52*(11), 8433-8437.

Gyasi, M. E. Francis, A. W. Chen, Y. Harrison, R. S. R. and Kodjo, A. R. (2014). Presentation of Glaucoma in the Greater Accra Metropolitan Area of Ghana. Ghana Medical Journal, 48: 3. 143. DOI: http://dx.doi.org/10.4314/gmj.v48i3.5

Hahn, S. R., Friedman, D. S., Quigley, H. A., Kotak, S., Kim, E., Onofrey, M., & Mardekian, J. (2010). Effect of patient-centered communication training on discussion and detection of nonadherence in glaucoma. *Ophthalmology*, *117*(7), 1339-1347.

Hatala, A. R. (2012). The status of the "biopsychosocial" model in health psychology: Towards an integrated approach and a critique of cultural conceptions. *Open Journal of Medical Psychology*, *1*(04), 51.

Holló, G., Katsanos, A., Boboridis, K. G., Irkec, M., & Konstas, A. G. (2018). Preservative-free prostaglandin analogs and prostaglandin/timolol fixed combinations in the treatment of glaucoma: efficacy, safety and potential advantages. *Drugs*, 1-26.

Huppert, F. A. (2009). Psychological well- being: Evidence regarding its causes and consequences. *Applied Psychology: Health and Well- Being*, *1*(2), 137-164.

Janey L. WIGGS, (2013). Genetics and Glaucoma. September/October 2013 Glaucoma today. 53-54.

Kyari, F., Abdull, M. M., Bastawrous, A., Gilbert, C. E., & Faal, H. (2013). Epidemiology of glaucoma in sub-saharan Africa: prevalence, incidence and risk factors. *Middle East African journal of ophthalmology*, *20*(2), 111.

Lawrence, Scott D. and Budenz, Donald L. (2013). Meeting the challenge of glaucoma in Africa: Innovative strategies and increased investment are required to improve the diagnosis and treatment of glaucoma. International Perspectives: glaucoma today, 19.

Leigh, H. (2013). *The patient: Biological, psychological, and social dimensions of medical practice*. Springer Science & Business Media.

Leske, M. C., Wu, S. Y., Nemesure, B., & Hennis, A. (2010). Causes of visual loss and their risk factors: an incidence summary from the Barbados Eye Studies. *Revista Panamericana de Salud Pública*, *27*, 259-267.

Lin, Herng-Ching, Chien, Ching-Wen, Hu, Chao-Chien, Ho, Jau-Der. (2010). Comparison of comorbid conditions between Open-Angle Glaucoma patients and a control cohort: A case-control study. Ophthalmology. 117 (11): 2088-2095. DOI: 10.1016/j.ophtha.2010.03.003.

Loon, S. C., Jin, J., & Jin Goh, M. (2015). The relationship between quality of life and adherence to medication in glaucoma patients in Singapore. *Journal of glaucoma*, *24*(5), e36-e42.

Medeiros, F. A., Gracitelli, C. P., Boer, E. R., Weinreb, R. N., Zangwill, L. M., & Rosen, P. N. (2015). Longitudinal changes in quality of life and rates of progressive visual field loss in glaucoma patients. *Ophthalmology*, *122*(2), 293-301.

Michopoulos, I., Douzenis, A., Kalkavoura, C., Christodoulou, C., Michalopoulou, P., Kalemi, G., & Lykouras, L. (2008). Hospital Anxiety and Depression Scale (HADS): validation in a Greek general hospital sample. *Annals of general psychiatry*, *7*(1), 4.

Otabil, Kenneth Bentum, Tenkorang, Seth Boateng, Mac, Ankrah Lennox and Otabil, Emmanuel Arkaa. (2013). Prevalence of Glaucoma in an Eye Clinic in Ghana. Russian Open Medical Journal. 2: 0310. ISSN 2304-3415. DOI: 10.15275/rusomj.2013.0310

Paletta Guedes RA, Paletta Guedes VM, Freitas SM, Chaoubah A. (2012). Quality of Life of Medically Versus Surgically Treated Glaucoma Patients, J Glaucoma, 7.

Pambo, E. A. S. (2013). *Quality of Life of Patients with Low Vision Attending Korle-Bu and Eastern Regional Hospitals* (Doctoral dissertation, University of Ghana).

Pan, S. Y., Cameron, C., DesMeules, M., Morrison, H., Craig, C. L., & Jiang, X. (2009). Individual, social, environmental, and physical environmental correlates with physical activity among Canadians: a cross-sectional study. *BMC public health*, *9*(1), 21.

Phelan, J. C., Link, B. G., & Tehranifar, P. (2010). Social conditions as fundamental causes of health inequalities: theory, evidence, and policy implications. *Journal of health and social behavior*, *51*(1_suppl), S28-S40.

Prakash, B. (2010). Patient satisfaction. *Journal of Cutaneous and Aesthetic Surgery*, *3*(3), 151.

Pratap Challa, (2008). Glaucoma Genetics, Int Ophthalmol Clin. 48(4): 73–94. doi:10.1097/IIO.0b013e318187e71a.

Ramulu, P. Y., Maul, E., Hochberg, C., Chan, E. S., Ferrucci, L., & Friedman, D. S. (2012). Real-world assessment of physical activity in glaucoma using an accelerometer. *Ophthalmology*, *119*(6), 1159-1166.

Ramulu, P. Y., Van Landingham, S. W., Massof, R. W., Chan, E. S., Ferrucci, L., & Friedman, D. S. (2012). Fear of falling and visual field loss from glaucoma. *Ophthalmology*, *119*(7), 1352-1358.

Realini T. (2013). Selective laser trabeculoplasty for the management of open-angle glaucoma in St. Lucia. JAMA Ophthalmol. 131: 321-327.

Skalicky S, Goldberg I. (2008). Depression and quality of life in patients with glaucoma: a cross-sectional analysis using the Geriatric Depression Scale-15, assessment of function related to vision, and the Glaucoma Quality of Life-15, J Glaucoma, 17(7):546–51.

Skalicky SE, Goldberg I, McCluskey P. (2012). Ocular surface disease and quality of life in patients with glaucoma, Am J Ophthalmol, 153(1):1–9.

Skevington, S. M., & McCrate, F. M. (2012). Expecting a good quality of life in health: assessing people with diverse diseases and conditions using the WHOQOL- BREF. *Health Expectations*, *15*(1), 49-62.

Street Jr, R. L., Makoul, G., Arora, N. K., & Epstein, R. M. (2009). How does communication heal? Pathways linking clinician–patient communication to health outcomes. *Patient education and counseling*, *74*(3), 295-301.

Swan, M. (2009). Emerging patient-driven health care models: an examination of health social networks, consumer personalized medicine and quantified self-tracking. *International journal of environmental research and public health*, *6*(2), 492-525.

Thota, A. B., Sipe, T. A., Byard, G. J., Zometa, C. S., Hahn, R. A., McKnight-Eily, L. R., & Gelenberg, A. J. (2012). Collaborative care to improve the management of depressive disorders: a community guide systematic review and meta-analysis. *American journal of preventive medicine*, *42*(5), 525-538.

Uusitalo, H., Chen, E., Pfeiffer, N., Brignole- Baudouin, F., Kaarniranta, K., Leino, M., & Petzold, G. (2010). Switching from a preserved to a preservative- free prostaglandin preparation in topical glaucoma medication. *Acta ophthalmologica*, *88*(3), 329-336.

Van Gestel, A., Webers, C. A., Beckers, H. J. M., Van Dongen, M. C. J. M., Severens, J. L., Hendrikse, F., & Schouten, J. S. A. G. (2010). The relationship between visual field loss in glaucoma and health-related quality-of-life. *Eye*, *24*(12), 1759.

Weinreb, R. N., & Kaufman, P. L. (2009). The glaucoma research community and FDA look to the future: a report from the NEI/FDA CDER Glaucoma Clinical Trial Design and Endpoints Symposium. *Investigative ophthalmology & visual science*, *50*(4), 1497-1505.

Whigham, B., Oddone, E. Z., Woolson, S., Coffman, C., Allingham, R. R., Shieh, C., & Muir, K. W. (2018). The influence of oral statin medications on progression of glaucomatous visual field loss: A propensity score analysis. *Ophthalmic epidemiology*, *25*(3), 207-214.

WHO. WHO | Constitution of WHO: principles. (2016). Retrieved 11th November 2017 from http://www.who.int/about/mission/en/.

Wonderling, D., Sawyer, L., Fenu, E., Lovibond, K., & Laramée, P. (2011). National clinical guideline centre cost-effectiveness assessment for the national institute for health and clinical excellence. *Annals of Internal Medicine*, *154*(11), 758-765.

Yakah, D. (2018). International Institute for Productivity and Public Management. 17. Retrieved 24th September 2018 from https://www.ippum.org/files/publications/PUB-1525787175-SECTORAL%20PRODUCTIVITY%20ANALYSIS%20OF%20GHANA's%20ECONOMY.pdf

APPENDICES

APPENDIX A- PARTICIPANT CONSENT FORM – GLAUCOMA PATIENT

School of Public Health

College of Health Science

University of Ghana

Project Topic

Biopsychosocial determinants of Health-Related Quality among Glaucoma patients at the Emmanuel Eye Medical Center

Background

Dear Participant,

I wish to invite you to participate in an academic research involving the health-related quality of life among Glaucoma patients. My name is Emmanuel Boampong, a student of the School of Public Health, University of Ghana. I am undertaking a study on the topic **Biopsychosocial Determinants of Health-Related Quality among Glaucoma patients at the Emmanuel Eye Medical Center.**

The objective of this study is to examine the biological, social and psychological factors that determine health-related quality of life among Glaucoma patients. This will be achieved by exploring socio-demographic determinants (age, sex, marital status, employment, educational status and income), biological/ medical factors (IOP level, co- morbidities, side effects) and psychological factors (depression, stress and anxiety) in relation to quality of life. This will improve the doctor- patient relationship and also serve as a way to evaluate the current treatment

plans and policies aimed at targeting Glaucoma. The study also forms part of my work towards the award of a Master of Public Health Degree.

Procedures

The study seeks to interview Glaucoma patients over a six-week period at the Emmanuel Eye Medical Center, using a questionnaire.

Risks and Benefits

The information provided will help understand an accurate role of Glaucoma treatment on patients' quality of life and also identify issues and challenges to the current system of treatment that need to be addressed. Some questions might be sensitive and provide a little discomfort to you. In such cases, you can choose not answer or opt out. The information will be beneficial to you, as policy makers and authorities of the Emmanuel Eye Medical Center will be geared towards actions that will improve your health and those of other Glaucoma patients. Your participation in this study will only take about 20 minutes of your time. The information provided will be treated confidentially.

Right to refuse

You have the option not to participate in this study as it is voluntary and you are at liberty to withdraw from it at any time. Your participation is very vital to this study and strongly encouraged.

Patient's Consent

I, ……..…, declare that the objective, process, risks/ benefits and questions of the study have been read and fully explained to the best of my understanding. I therefore consent voluntarily to partake in this study with the understanding that I can withdraw from this study without it affecting my medical care in any way.

Signature/ thumbprint of participant ……..……

Date……. / …… / ……..

Interviewer's Statement

I, the undersigned, have explained this consent form to the patient in simple language that she/he understands, clarifying the purpose, process to be followed and risks/ benefits involved in this study. The patient/ participant has freely agreed to partake in this study.

Signature of interviewer……

Date ……. / …….. / ……

Address:

Emmanuel Boampong

P O Box CT 9475, Cantonments, Accra

In case of any concern you can contact the Ethics Administrator, Ms. Hannah Frimpong, GHS/ERC on: 0243235225 / 0507041223.

APPENDIX B - QUESTIONNAIRE

SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GHANA

DEPARTMENT OF EPIDEMIOLOGY AND DISEASE CONTROL

This questionnaire is designed to measure the health-related quality of life (HRQoL) among Glaucoma patients, explore social determinants of HRQoL, assess biological/ medical factors that are related to HRQoL, and HRQoL and to explore the association between psychological factors and HRQoL.

Please answer the questions as accurately as you can. All answers will be treated confidentially

Kindly tick (√) as appropriate

A. Demographic Details

1. Age at last birthday: **40- 49 [ ] 50-59 [ ] 60 - 69 [ ] 70 – 79 [ ]**
   80 and above [ ] Other [ ]
2. Gender: **Male [ ] Female [ ]**
3. Educational Level: **No education [ ] Primary [ ] Secondary [ ]**
   Undergraduate [ ] Post-graduate [ ]
4. Marital Status: **Single [ ] Married [ ] Divorced [ ] Widowed [ ]**
5. Religion: **Christian [ ] Muslim [ ] Traditionalist [ ] Other [ ]**
6. Average Monthly Income (GH₵) : **< 500 [ ] 501 – 1,000 [ ]**
   1,001 - 1,500 [ ] 1,501 - 2,000 [ ] 2,001- 2,500 [ ]
   2,501 – 3,000 [ ] 3,001 - 3,500 [ ] 3,501 - 4,000 [ ]
   4,001 – 4,500 [ ] 4,501 – 5,000 [ ] 5,001 - above [ ]
7. Number of **years** of diagnosis: **< 1 [ ] 1-5 [ ] 6- 10 [ ] 11-15 [ ]**
   16-20 [ ] 21-25 [ ] 26-30 [ ] 31-35 [ ]
   36-40 [ ] 40 and above [ ]

8. Initial IOP level at Diagnosis. **< 22 mmHg [ ] 22-40 mmHg [ ] > 40 mmHg [ ]**

9. Current IOP level: **< 22 mmHg [ ] 22-40 mmHg [ ] > 40 mmHg [ ]**

10. Occupation ……

11. Co morbidities ……

12. Topical treatment ……

13. Side effects experienced ……

SECTION A- HEALTH RELATED QUALITY OF LIFE ASSESSMENT

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. **Please choose the answer that appears most appropriate.** If you are unsure about which response to give to a question, the first response you think of is often the best one. I ask that you think about your life **in the last four weeks.**

		Very poor	Poor	Neither poor nor good	Good	Very good
1.	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2.	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last four weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3.	To what extent do you feel that physical pain prevents you from doing what you need to do?	5	4	3	2	1

4.	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
7.	How well are you able to concentrate?	1	2	3	4	5
8.	How safe do you feel in your daily life?	1	2	3	4	5
9.	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about how completely you experience or were **able to do** certain things in the last four weeks.

		Not at all	A little	Moderately	Mostly	Completely
10.	Do you have enough energy for everyday life?	1	2	3	4	5
11.	Are you able to accept your bodily appearance?	1	2	3	4	5
12.	Have you enough money to meet your needs?	1	2	3	4	5
13.	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14.	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
15.	How well are you able to get around?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16.	How satisfied are you with your sleep?	1	2	3	4	5
17.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18.	How satisfied are you with your capacity for work?	1	2	3	4	5
19.	How satisfied are you with yourself?	1	2	3	4	5
20.	How satisfied are you with your personal relationships?	1	2	3	4	5
21.	How satisfied are you with your sex life?	1	2	3	4	5
22.	How satisfied are you with the support you get from your friends/ family?	1	2	3	4	5
23.	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24.	How satisfied are you with your access to health services?	1	2	3	4	5
25.	How satisfied are you with your means of transport?	1	2	3	4	5

The following question refers to how often you have **felt or experienced** certain things in the last four weeks.

		Never	Seldom	Quite often	Very often	Always
26.	How often do you have negative feelings such as despair, anxiety, depression?	5	4	3	2	1

SECTION C- STRESS, ANXIETY AND DEPRESSION ASSESSMENT

The questions below assess whether a patient either shows stress, anxiety, depression or all. Tick appropriate answers that apply. Immediate answers give a better reflection.

STRESS, ANXIETY

1. I feel tensed, nervous or angry

A. Most of the time [ ] **B. Lots of time [ ]** **C. Occasionally [ ]** **D. Not at all [ ]**

2. I get frightened with a feeling of rapid back and forth movement in my stomach:

A. Not at all [ ] **B. Occasionally [ ]** **C. Quite often [ ]** **D. Very often [ ]**

3. I get frightened feeling as if something awful is about to happen

A. Very definitely and quite badly. **B. Yes but not too badly**

C. A little but I'm not worried [ ] **D. Not at all [ ]**

4. I feel restless when it is time for me to be on the move, begin a task or journey

A. Very often [ ] **B. Quite a lot [ ]** **C. Not very much [ ]** **D. Not at all [ ]**

5. Worrying thoughts go through my mind.

A. A great deal of the time [ ] **B. A lot of the time [ ]**

C. From time to time, but not too often [ ] **D. Only occasionally [ ]**

6. I get sudden feelings of panic or anxiety:

A. Very often [ ] **B. Quite often [ ]** **C. Not very often [ ]** **D. Not at all [ ]**

7. I can sit at ease and feel relaxed

A. Definitely [ ] **B. Usually [ ]** **C. Not often** **D. Not at all**

DEPRESSION

1. I feel as if I am slowed/ weighed down

A. Nearly all the time [ ] **B. Very often [ ]** **C. Sometimes [ ]** **D. Not at all [ ]**

2. I enjoy the things I used to enjoy.

A. Most definitely [ ] **B. Not much [ ]** **C. Only a little [ ]** **D. Not at all** [ ]

3: I have lost interest in my appearance:

A. Definitely [ ] **B. I don't take as much care as I should [ ]**

C. I may not take quite as much care [ ] **D. I take just as much care as ever [ ]**

4. I can laugh and see the funny side of things:

A. As much as I always could [ ] **B. Not quite so much now [ ]**

C. Definitely not so much now [ ] **D. Not at all [ ]**

5. I look forward with enjoyment to things:

A. As much as I ever did [ ] **B. Rather less than I used to [ ]**

C. Definitely less than I used to [ ] **D. Hardly at all [ ]**

6. I feel cheerful

A. Not at all [ ] **B. Not often [ ]** **C. Sometimes [ ]** **D. Most of the time [ ]**

7. I can enjoy reading a good book or listening to radio or watch a TV program

A. Often [ ] **B. Sometimes [ ]** **C. Not often [ ]** **D. Very seldom [ ]**

Do you have any comments about the assessment?

_____

_____

_____

THANK YOU FOR PARTICIPATING