

**GLAUCOMA AWARENESS AMONG CLIENTS PRESENT AT THE
OUTPATIENT DEPARTMENT OF INTERMEDIATE HOSPITAL,
OSHAKATI, NORTHERN NAMIBIA**

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF
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ABSTRACT

Primary open-angle glaucoma (POAG) is the major cause of irreversible blindness worldwide among black people. Early detection and treatment can prevent blindness, a consequence of glaucoma. Individuals need to be aware of glaucoma and seek assessment regularly for early detection and diagnosis of the disease. Awareness of glaucoma has not been previously documented in a Namibian setting. The aim of this study was to explore and describe the awareness of glaucoma that clients have who attended the out patient department (OPD) at the Intermediate Hospital Oshakati (IHO), Northern Namibia. Objectives of the study were to explore and describe the awareness of clients regarding glaucoma attending the OPD of IHO and to identify specific awareness raising strategies on glaucoma as a means to prevent glaucoma visual impairments. The study was conducted in November 2010 at the OPD of the said hospital. The research tool was an interview guide which was administered to 400 respondents between the ages of 40-70 years who attended the OPD. Face to face interview was used and interview guide's data included socio-demographics of the respondents, their awareness and knowledge about glaucoma and the usefulness of effective communication strategies and awareness raising of the disease. Sixty percent (60.0%) of respondents were female and 40.0% of respondents were male; 64.8% of respondents were unemployed, 22.3% were employed and 13.0% were retired. In terms education levels 44.5% of respondents did not complete primary education, 22.0% completed primary school, 15.0% completed secondary school, 13.8% did not attend any formal school and only 4.5%

completed an undergraduate degree. The majority of respondents (99.0%) were aware that glaucoma is a blinding eye condition. None of the respondents knew that glaucoma is a common eye condition in which fluid pressure inside the eye rises because of slow fluid drainage from the eye. Awareness of glaucoma was independent of age, gender, employment status and educational status. Age and positive family history were mostly identified by respondents as the greatest risk factor for glaucoma. An overwhelming majority of respondents (99.3%) were aware that information, education and communication (IEC) materials are useful in increasing knowledge of glaucoma; all of them believed that effective health communication is the best strategy to raise glaucoma awareness. The majority of people are aware that glaucoma is a blinding condition but cannot describe the condition or mention any associated risk factors thus glaucoma knowledge in this study population is very low. There is a need to adequately inform and educate people about their health, especially eye health. An efficient IEC and population screening strategy needs to be designed to increase the community's knowledge about glaucoma so that early diagnosis and treatment of individuals with glaucoma may be possible.

Key words: awareness, knowledge, glaucoma, information, education and communication materials, Intermediate Hospital Oshakati, outpatient department. information, education and communication, ophthalmic medical assistants.

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LIST OF ABBREVIATIONS

ACG	Acute closure glaucoma
AIDS	Acquire immune deficiency syndrome
BP	Blood pressure
CHWs	Community health workers
DM	Diabetes mellitus
FTF	Face to face interview
GIPF	Government institution funds
HE	Health education
HIV	Human immune virus
HIS	Health information system
ICD	International classification of disease
IEC	Information, education and communication
IHO	Intermediate Hospital Oshakati
IOP	Increase intraocular pressure
MOHSS	Ministry of Health and Social Services
OHTS	Ocular hypertension treatment study
OMA	Ophthalmic medical assistant
OPD	Out patient department
OR	Old ratio
PP	Perfusion pressure
POAG	Primary open-angle glaucoma
SADC	Southern Development Community

WHO World Health Organisation

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DEDICATION

I dedicate this piece of hard won achievement, commitment and perseverance to all ophthalmic medical assistants in the country for their hard work in combating avoidable blindness across all sectors despite huge challenges facing them. I love you all.

DECLARATIONS

I, Alfons Amoomo, declare hereby that this study is a true reflection of my own research, and that this work or part thereof has not been submitted for a degree in any other institution of higher education.

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..... [signature]

Date.....

Student's name

CHAPTER 1

1.1. INTRODUCTION TO THE STUDY

This chapter provides an overview of research undertaken as well as the study conducted to explore and describe the awareness of glaucoma that clients have at the out patient department (OPD) of Intermediate Hospital Oshakati (IHO) and identifications of awareness raising strategies to enhance awareness of the disease. A brief background to the research problem is presented and objectives of the study are outlined. The awareness of glaucoma among clients is discussed and contextualised. Definitions and descriptions of key concepts in the study are also provided.

1.2. BACKGROUND OF THE STUDY

Visual impairment of whatever cause, is a significant handicap in today's society. The causes of a person's impaired vision or blindness may vary considerably, be it due to disease or other eye conditions. A significant proportion of the cases are due to genetic defect disease, one being glaucoma.

Glaucoma is a common eye condition in which the fluid pressure inside the eye rises because of retarded fluid drainage from the eye. If untreated, it may damage the optic nerve and other parts of the eye, causing loss of vision or even blindness. It results in peripheral vision loss, and is an especially dangerous eye condition because glaucoma frequently progresses without obvious symptoms (Medical Dictionary, 2008).

Glaucoma is a disease of the eye and is a major cause of irreversible blindness worldwide (Resnikoff, Pascolini, Etya'ale, Kocur, Pararajasegarama, Pokharel & Maiotti, 2004). Sadly the disease is irreversible. Early and moderate disease is often asymptomatic, and when symptoms occur the disease is often advanced and is frequently not amenable to treatment.

There are two types of glaucoma: primary open-angle glaucoma and secondary glaucoma. Secondary glaucoma causes primary angle-closure glaucoma and may result from an eye injury, surgery, growth of an eye tumour, or as a complication of a medical condition such as diabetes or medication (Yves & Walid, 2007). However, the most common by far is the age related primary open-angle glaucoma (POAG).

Glaucoma is a major public health problem despite available diagnostic measures. It is estimated that 4.5 million people are currently blind due to glaucoma (12.0%) making it second to cataracts which account for 50 million (47.9%) worldwide. Published projection figures indicate that another 4.5 million people will go blind from POAG and 3.9 million from primary-angle closure glaucoma in 2010 (Bourne, 2006; Quigley & Broman, 2006; Giangiacomo & Coleman, 2009). These authors further project that there will be 60.5 million people with POAG and angle closure glaucoma (ACG), increasing to 79.6 million by 2020, and of these, 74% will have POAG. Women will comprise 55% of POAG and 59% of all glaucoma in 2010. These figures plainly suggest that glaucoma is a disease of particular public health significance. Blindness and low vision, independent of cause, are important global health issues because they confer increased morbidity and mortality, decreased

quality of life, and substantial economic productivity (Vu, Keefe, McCathy & Taylor, 2005).

In the absence of epidemiological data on the magnitude of visual impairments in Namibia, there is no evidence of reliable epidemiological data, neither on glaucoma visual impairments nor on visual impairments from other causes. However, the World Health Organization (WHO) estimates that at least 1.00% of the country population would be blind from various causes, mainly cataract, glaucoma and corneal disorders. Cataract alone is thought to account for at least 50% of the total blindness followed by glaucoma with 4% of the 40 years and above population. The WHO further projects a 0.2% annual incidence rate of glaucoma for most of the Southern African countries. Based on the WHO estimates, Namibia is expected to have at least 10,920 (4%) people who are expected to live with glaucoma (World Health Organization [WHO], 2008).

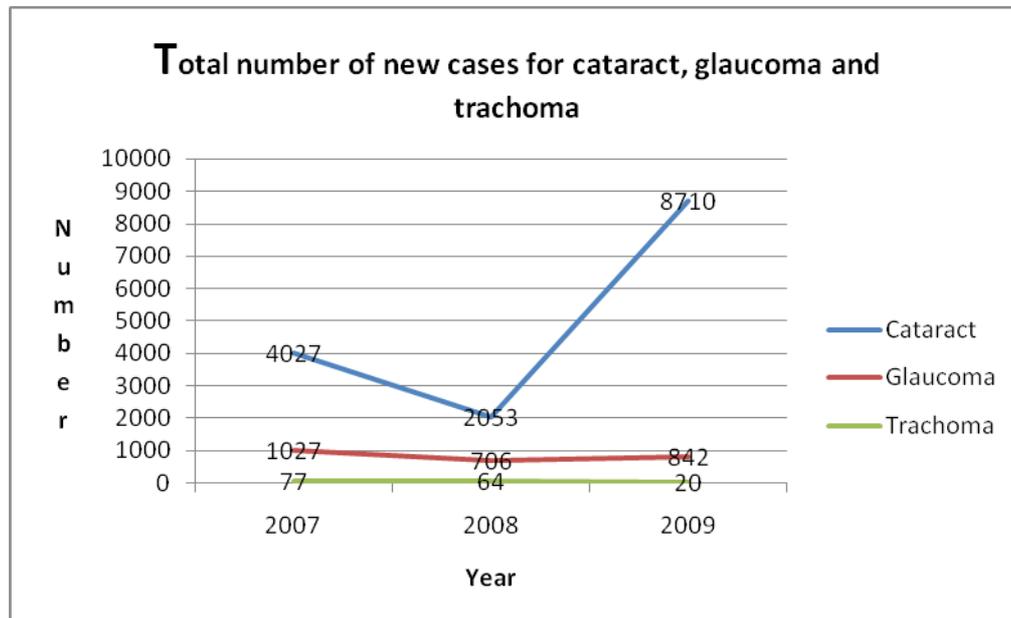
With the declining fertility rate and population growth, increased adult and infant mortality rates due to human immune virus/acquired immune deficiency syndrome (HIV/AIDS) pandemic, the prevalence of blindness is expected to be less than the WHO estimates. This also conforms to recent evidence from studies conducted elsewhere in Africa suggesting the projection of between 0.4 and 0.5% prevalence blindness in the Southern Development Community (SADC) region is lower than the WHO estimates (Mathenge et al., 2007). In view of this the prevalence of blindness in Namibia has been adjusted to 0.5% for total blindness for realistic planning purposes.

In addition to these, the Census of 2001 estimated that at least 43% of the total population suffers from visual disability. The accuracy and reliability of such findings could not be verified as there were conflicting operational definitions of visual disability, the classification of visual impairments or disability used in the study (Namibia population and housing census [census], 2001).

The health information system (HIS) data on glaucoma coincides with the WHO estimates in terms of projected glaucoma incidences per year. However, such data also could not be relied on, due to incompleteness and other technical shortfalls. For example the data system records and counts the frequency of visits (follow-ups) rather than the number of cases per visit.

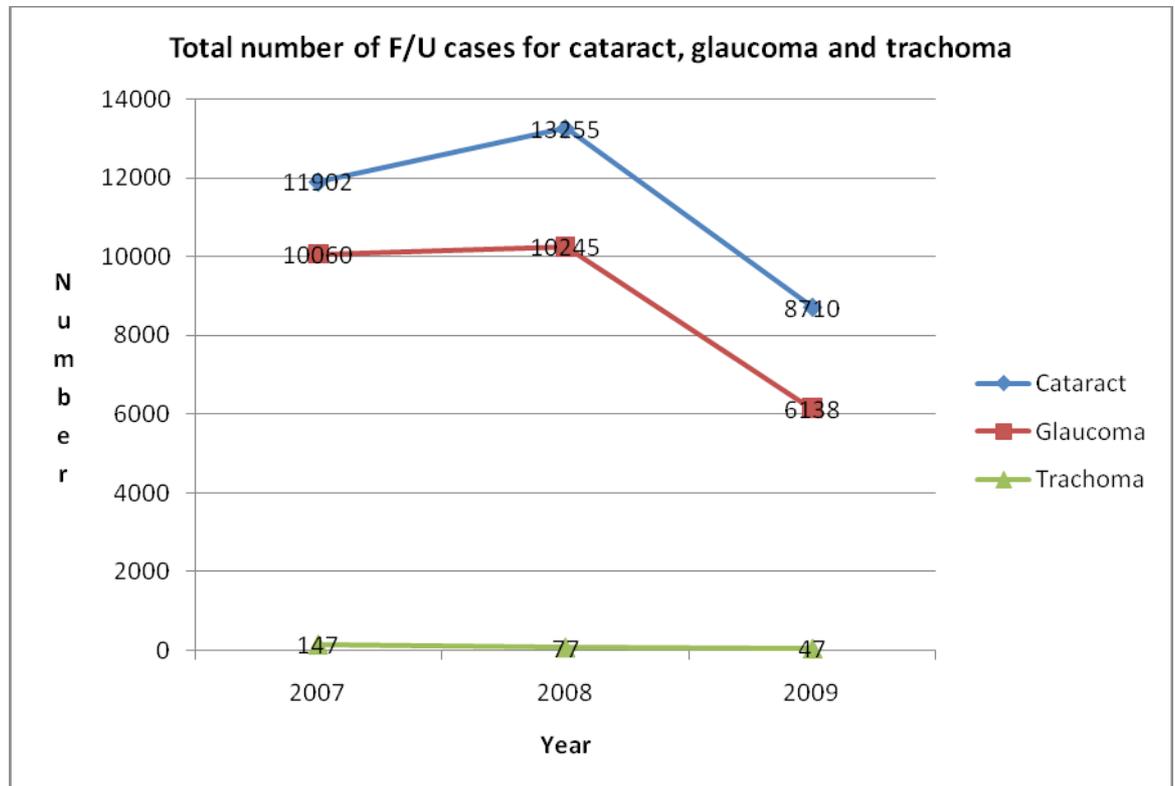
According to HIS, clinical records show the followings trends of new glaucoma, cataract and trachoma cases recorded between the years 2007-2009 at public health facilities countrywide

Figure 1: New glaucoma cases between 2007-2009 in Namibia.



In 2008-2009 the number of new cases of glaucoma was lower than 2007. According to the researcher's observation this could be due to the fact that there was no ophthalmologist in 2008 and the ophthalmic medical assistant (OMAs) might have been reluctant to properly examine the patients and therefore missed the diagnosis. It could also be that data were entered into the computer by nurses who are not properly trained on data management and analysis and they could have easily not entered data properly.

The number of new cases of glaucoma might be low, but the impact of glaucoma on an individual, as well as socially and economically, is very high. The low number of new cases could also be that patients had advanced glaucoma and nothing can be done to restore their vision. The number of follow-up cases for some eye conditions is depicted graphically in Figure 2.

Figure 2: Total number of follow-up cases for cataract, glaucoma and trachoma

These figures are not a true reflection due to the fact that the software system counts number of visits per patients and not cases seen. That is why follow-up patients are recorded more than twelve times compared to new cases (Intermediate Hospital Oshakati Health Information System [IHO-HIS], 2007-2009)

Visual impairments and blindness have significant public health importance in developing countries both in terms of DALY and the serious socioeconomic challenges they pose to the community and country at large, both as a result of direct and indirect higher costs of caring for the visually impaired persons and that of educating and rehabilitating the blind, loss of opportunities and productivity (World Health Organization [WHO], 2008).

Glaucoma visual impairment causes prolonged suffering, loss of independence and personal dignity, and premature death as a consequence of blindness and poverty. All of these factors constitute a significant socio-economic burden to visually impaired persons, their families and the country at large.

Raising awareness of glaucoma, early detection and prevention of glaucoma progression through strict control of intraocular pressure with anti-glaucoma medicine, is the key to halting the effects of glaucoma, but current worldwide estimates reveal that more than half of glaucoma sufferers do not even realise they have the disease. Although incurable, glaucoma is a treatable disease and its impact can be minimised. When glaucoma is detected early and appropriate treatment is instituted 90% of blindness from glaucoma can be eliminated. However, these goals are restricted because a simple and cost-effective screening program for glaucoma has yet to be developed in Namibia, more specific in the Oshana Region.

In developed countries, glaucoma detection is by opportunistic screening, while in developing countries, such as Namibia, this may not be feasible. Poverty, illiteracy, lack of transportation, and inadequate health facilities, together delay case detection and inadequate or no treatment (Lewallen & Courtright, 2006; Gyasi, Amoaku & Asamany, 2007; (Ministry of Health and Social Services [MOHSS], 2008). This is in line with a study done by Naidoo (2008) who found that blindness, disabling visual impairment and overall lack of eye care services are often the result of social, economic and developmental challenges of the developing world. Eye disease that

causes preventable blindness is often the result of factors such as poverty, lack of education, inadequate health care services and lack of opportunities for people to control or influence their health care. All the factors mentioned by Naidoo (2008) also prevail in the Oshana Region. For example only 4.0% of inhabitants have more than secondary education and 31.5% women and 42.2% men are not employed (Ministry of Health and Social Services [MOHSS], 2008).

However, a study done by Munachonga, Hall and Courtright (2007) concluded that providing good quality counselling index cases and offering glaucoma examination free of charge is not sufficient to reach those at risk of glaucoma thereby suggesting that the indirect costs of accessing services are significant for use of examination services. This concurs with the opinion of Hatt, Wormald and Burr (2006) who did not recommend population based screening, although much can be done to increase glaucoma awareness and encourage at risk individuals to seek testing. Greater challenges face poor and emerging economics and countries where there are substantial health and wealth inequalities.

Poor public glaucoma awareness may adversely influence individuals undergoing regular eye sight tests. One way to prevent late presentation would be to provide members of the public with information on the importance of early detection and treatment. Early detection is essential to stop the progress of the disease. An individual's risk of vision loss could be reduced if those at risk of blinding eye disease obtain a comprehensive eye test on a regular basis (Baker, & Murdoch, 2008). Comprehensive eye test is in accord with a recommendation made by Melka

and Alemu (2006), namely that poor public awareness and lack of treatment services were the important factors that largely precipitated the occurrence of blindness. Thus in addition to improving the diagnostic and therapeutic facilities, intensive work should be done to increase public awareness on the nature of the disease, to expand the infrastructure and to develop and rationally deploy the required human resources.

Oshana Region which is one of the thirteen administrative regions in Namibia, consists of 10 constituencies with approximately 161,916 residents; 87,958 are female and 73,957 male (Namibia population and housing census [Census], 2001).

This study focused on the Oshana Region which is one of the four key regions in the central north of Namibia and has a growth rate of 1.8. An estimate of the population of Oshana Region according to growth rate would mean a population with more than 9 912 821.87 inhabitants. This estimate is very high and the population of Oshana Region could still be the same or slightly increase due to the fact that the fertility rate for all age groups has decreased over time. For example, the fertility rate for women aged 15-19 was 88 births per 1,000 women in 1988-1992, compared to 74 births per 1,000 women in 2003-2007 (MOHSS, 2008). It can be assumed that the impact of AIDS will reduce the population of Oshana inhabitants by 10 percent.

The three towns of Ondangwa, Oshakati and Ongwediva, which are situated along the main regional road to Ruacana, are the most populous and famous commercial centres of the north under development, in contrast to their rural hinterlands. Oshakati is a major town in far northern Namibia. In the local Oshiwambo language

of the Owambo people the town's name means 'that which is between'. After Windhoek, Oshakati is the second biggest town in Namibia in terms of population concentration and according to the Census of 2001 it was home to approximately 45 000 people. The town is, however, growing fast and has recorded an annual population increase of 5.5% since Namibia's independence. The urban centre offers all key services to the people of the said four regions, for example a regional council, the IHO; government institutions pension fund (GIPF), social security, a central bank, and high court.

The urban settlements attract many migrants who seek employment opportunities and business ventures or health treatment. Consequently the IHO in Oshana Region tends to attract many people with eye problems, including glaucoma. It is a 750-bed hospital which serves Oshakati Hospital District. It has a catchment population of approximately 186,754 and is located in Oshakati town on the very busy Trans Kalahari Highway. It also serves as a referral hospital for four regions, namely, Ohangwena, Oshikoto, Omusati and Kunene, and offers all key eye care services such as diagnosis, treatment and surgery (Intermediate Hospital Oshakati [IHO], 2009).

1.3 PROBLEM STATEMENT

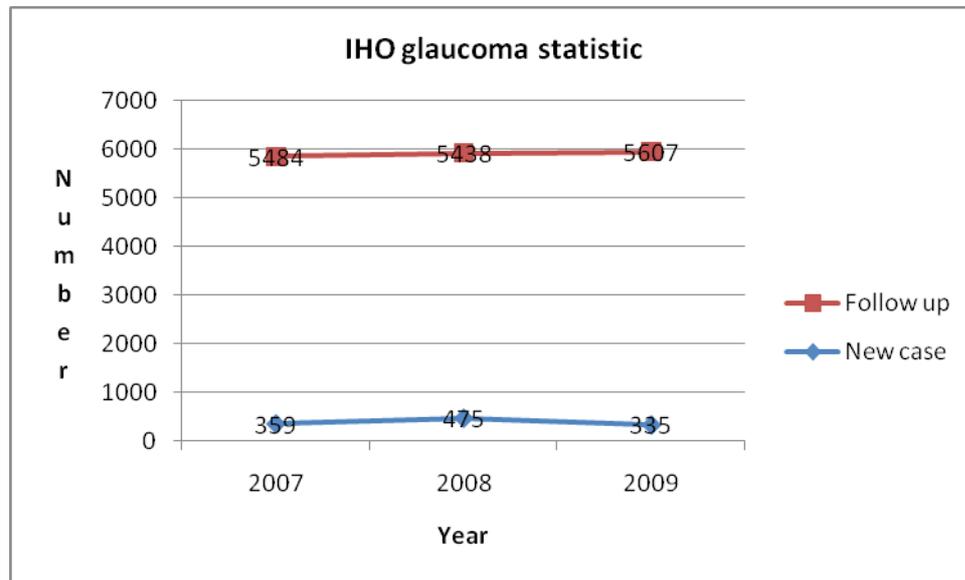
Sixty percent of patients that were diagnosed having glaucoma at the IHO eye clinic for the first time were already at an advanced stage of glaucoma and not much could be done to save their vision. Patients who fail to have their eyes examined regularly

and who thus present with the disease in its advanced stage is not only a concern at IHO as this worrying trend has also been reported in other African countries. For example, a study done by Mafwira, Bowman, Wood and Kabiru (2005) found that an audit in a disability hospital included 29% of glaucoma patients (Dar es Salaam) and 53% of patients with eye conditions (Kano) who were already blind. Seventy percent of patients had cup/disc ratio of more than 0.8 in the better eye in Dar es Salaam. How can we improve on this? Population based glaucoma screening is not advocated because there is not an available good screening test and it is impractical (Bowman & Kirupananthan, 2006). Due to lack of information or awareness on glaucoma patients might already be blind when they attend the eye clinic at IHO.

There is no evidence of a published epidemiological study done in Namibia regarding glaucoma awareness. One might also infer that poor glaucoma awareness affects all regions across the country.

Considering the number of eye clinics in the four northern regions of Namibia (Ohangwena, Omusati, Oshana and Oshikoto) that are managed by OMAs and primary eye care provided by primary health care (PHC) nurses, one would have expected that patients would report early for treatment, yet this seems not to be the case.

Figure 3: Annual glaucoma new and follow-up cases at intermediate Hospital, Oshakati (HIS 2007-2009)



From the data presented in Figure 3 it is evident that there has been an increase in the number of new patients who were diagnosed with glaucoma at IHO between 2007 and 2009. Some possible explanations for this increase in diagnosis of the disease could be that (i) the hospital purchased a digital tonometer to measure intraocular pressure, which is more accurate than the previously used applanation tonometer, and (ii) the human resources increased as prior to 2007 there was only one ophthalmologist who had been running the clinic alone for the past ten years but now there is a full time ophthalmologist and one ophthalmic medical officer.

Considering the physiology of the disease one might infer that there has also been an increase in reported blindness in patients visiting the eye clinic since the HIS software does not report blindness. The eye clinic patient register does not classify specific types of blindness. The HIS report needs improvement in order to determine the prevalence of glaucoma blindness in the country.

The increase of glaucoma new cases reflected in Figure 3 could be compared to a study done in South Africa by Cook (2009) who stated that 400 new cases of glaucoma per one million people are reported annually. One should bear in mind that visual loss from glaucoma is irreversible.

Health education pertaining to the early detection of glaucoma should influence individuals to participate in regular eye tests. This is an important means of preventing needless visual impairment and preserving quality of life. Glaucoma blindness among patients examined at the eye clinic at the IHO could be influenced by lack of information on the nature of the disease.

The above background motivated the researcher to answer the following research questions:

1. What awareness do clients at the general out patient department of Intermediate Hospital Oshakati have about glaucoma?
2. Which specific preventive strategies would be necessary to address glaucoma awareness?

1.4 PURPOSE OF THE STUDY

The purpose of this study was to explore and describe the awareness of glaucoma that clients have at OPD of IHO and to identify specific preventive strategies to increase awareness of glaucoma.

1.5 OBJECTIVES OF THE STUDY

The objectives of this study were:

1. To explore and describe the awareness of clients regarding glaucoma attending the OPD of IHO.
2. To identify specific awareness raising strategies on glaucoma as a means to prevent glaucoma visual impairments.

1.6 THE SIGNIFICANCE OF THE STUDY

The researcher identified a lack of public awareness on glaucoma among clients attending at the OPD of IHO with the intent to develop strategies for public awareness and education on glaucoma as a blinding disease and its serious consequences. The focus of the study will be on increasing the awareness of glaucoma in the northern regions in Namibia and thereby improving the quality of lives of the population.

Furthermore, the findings of this study will generate valuable inputs for policy as well as hypothetical baselines for future researches in the areas of glaucoma in the country and beyond.

1.7 DEFINITION OF CONCEPTS

Glaucoma: The term glaucoma refers to a group of diseases that have in common a characteristic optic neuropathy with associated visual function loss (American academy of ophthalmology, 2009-20010).

Awareness: The state or level of consciousness where sense data can be confirmed by an observer. The awareness of one type of idea naturally fosters an awareness of another idea (English Dictionary, 2010).

Knowledge: Expertise, and skills acquired by a person through experience or education, the theoretical or practical understanding of a subject (Oxford English Dictionary, 2010).

Information, education and communication (IEC): It combines strategies, approaches and methods that enable individuals, families, groups, organisations and communities to play an active role in achieving, protecting and sustaining their own health. In this study IEC materials mean graphics which could be included in brochures or posters on glaucoma (The communication Initiative site, 2008).

Normal vision: The WHO defines normal vision as a visual acuity of 6/6-6/18 in a better eye with available best correction (WHO, 2008).

Visual impairment: The WHO defines visual impairment as a visual acuity of 6/36-6/60 in a better eye (WHO, 2008).

Severe visual impairment: The WHO defines severe visual impairment as a visual acuity of 6/60-3/60 in a better eye or a visual field constriction of less than 20 degrees in the better eye with best possible correction (WHO, 2008).

Blindness: The WHO defines blindness as a visual acuity worse than 3/60 meter or visual field of less than 10 degrees in the better eye with best possible correction (WHO, 2008).

Best possible correction: This refers to the best visual acuity achieved with spectacles, contact lenses, or surgery (WHO, 2008).

1.8 Outline of the study

Chapter 1 outlines, background to the problem, statement of the problem, the purpose of the study, objectives of the study, the significance of the study as well as definitions of key concepts. Chapter 2 covers the literature review conducted for the study. Chapter 3 discusses the research design and methodology. Chapter 4 describes the data analysis and the findings of the study. Chapter 5 presents the conclusions, recommendations and limitations of the study.

1.9 Conclusion

This chapter briefly outlined the need for the provision of health information by eye care providers to the general public in order to enhance public awareness on glaucoma blindness in order to reduce glaucoma effects. The purpose of the study, research objectives, problem statement and significance of the study was also described and key concepts were defined. In chapter 2, literature review will be discussed.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter covers a literature review on the knowledge clients have regarding glaucoma. The researcher conducted an extensive literature review on concepts such as glaucoma awareness, risk factors for glaucoma, barriers to uptake glaucoma services, information, education and communication materials and raising awareness strategies.

Jones (2010) states that a literature review aims to identify, analyze, assess and interpret a body of knowledge related to a particular topic and is normally required as part of a dissertation or thesis. In this case, it sets a context for a research study and provides a rationale for addressing particular research questions in the light of an existing body of literature.

Within the health field, a literature review can also aim to assess existing knowledge on the efficacy of an intervention, such as the evidence base for the preferred treatment of a particular disease.

2.2 PATHOPHYSIOLOGY OF GLAUCOMA

Primary open-angle glaucoma result from overproduction or obstruction of the outflow of aqueous humour through the trabecular meshwork or sclerotic canal, causing increased intraocular pressure and damage to the optic nerve. Glaucoma is a chronic, slowly progressive, usually bilateral neuropathy of the optic nerve. Untreated glaucoma eventually leads to complete loss of vision. About 10% of patients with glaucoma become uni-or bilaterally blind. The pathophysiology of glaucoma is a progressive loss of ganglion cells resulting in visual field damages related to the intraocular pressure (Chin & Regine, 2008).

2.3 RISK FACTORS FOR GLAUCOMA

Everyone is at risk for glaucoma from babies to senior citizens. Older people are at a higher risk for glaucoma but babies can be born with glaucoma. Young adults can get glaucoma, too. There are several known risk factors for glaucoma; these include increasing age, family history of glaucoma, race and ethnicity, nearsightedness, high blood pressure, diabetes mellitus and elevated intraocular pressure.

A connection between age and primary open-angle glaucoma (POAG) has been described in most studies. Evidence from research revealed that people between the age of 40 and 80 years are at higher risk of developing glaucoma (De Voogd, Ikram, Wolfs, Jansonius, Hofman & De Jong, 2005; De Voogd; Ikram; Wolfs; Jansonius; Hofman & De Jong; 2006; Rudnicka, Mt-Isa, Owen, Cook & Ashby, 2006; Leske, Wu, Hennis, Honkanen & Nemesure, 2008). These findings are in line with the Meiktila Eye Study (Franzco, MBBS, Franzco, Franzco, Franzco & MD, 2007). In

the univariate analysis, increasing age ($P=0.024$), spherical equivalent ($P=0.01$), axial length ($P=0.023$) and intraocular pressure (IOP; $P<0.001$) were significantly associated with POAG. In the multivariate analysis, myopia <0.5 D ($P=0.049$), increasing age and IOP ($P<0.001$) were significant risk factors for POAG.

Kawase, Tomidokoro, Araie, Lwase & Yamamoto (2008), in a Tajim study found a positive correlation between IOP and myopia. Family history is another risk factor for glaucoma. There is evidence that family history of POAG is a risk factor (Kwon, Fingert, Kuehn & Alward, 2009). Risk indicators of open-angle glaucoma correlate highly in families, and the patterns are consistent with the hypothesis of genetic determinants of these factors (Klein, Klein & Lee, 2004). A number of genes have been identified as possible factors in many cases of glaucoma. Typically, early-onset forms of glaucoma are inherited as Mendelian-dominant or Mendelian-receiver traits, including early-onset open-angle glaucoma, congenital glaucoma, and glaucoma associated with pigment dispersion syndrome (Wiggs, 2007).

The prevalence of POAG relating to race and ethnicity is worth mentioning. Rudnicka et al., (2006) found that black populations had the highest POAG prevalence in all ages, but the proportional increase in prevalence of POAG with age was highest in the white population. This is supported in the Barbados Eye Study by Leske, Wu, Hennis, Honkanen and Nemesure, (2008) which was carried out on a large population of black people. The study shows that the incidence of glaucoma was high in this African descent population where the established factors of older age, higher IOP, and family history, all contributed to risk.

Several vascular factors have been investigated with particular attention to blood pressure (BP) and perfusion pressure (PP) (Hulsman, Vingerling, Hofman, Witterman & de Jong, 2007; Leske et al., 2008). Risk factors of a vascular nature, such as systemic hypertension, atherosclerosis, vasospasm, and other vascular diseases, have been listed as potential factors capable of increasing the risk of POAG. On the other hand, systemic hypertension may increase risk by damaging the small vessel of the optic disk; furthermore, BP and IOP levels are positively correlated and a similar positive link between high BP and POAG might be expected.

Systemic conditions such as hypertension and diabetes mellitus have been studied as possible risk factors for POAG. Mitchell, Lee, Lochtchina and Wang (2009) reported that hypertension, particularly if poorly controlled, appears to be related to a modest, increased risk of POAG. Prevalence of POAG in patients who suffer from diabetes mellitus is slightly increased (De Voogd et al., 2006). According to Sanspre, Daum, Arthur, Schmidt and Pillion (2005) diabetes mellitus, hypertension and obesity increase the likelihood of glaucoma. This is evident in the work of Bonovas, Peponis and Filioussi (2004) who did a study on diabetes mellitus (DM) as a risk factor for POAG: a meta-analysis found that the association of diabetes mellitus with POAG was statistically significant assuming either a random effect (OR 1.50.95% confidence interval, CL0 1.16, 1.93) or a fixed-effects model (OR=1.27.95% CL, 1.10.1.45). Their meta-analysis results suggest that patients suffering from diabetes are at significantly increased risk of developing POAG. Clinicians should be ware of this possibility.

Omoti, Enock, Okeigbemen, Akpe and Fuh (2009), in their studies, concluded that higher systolic, diastolic, mean arterial, Blood Pressure and pulse pressure was found in black patients in Africa with open-angle glaucoma. In contrast, in a Rotterdam Study, no association between diabetes and POAG was detected. This is in line with the findings of Hulsman, Vingerling, Hofman, Witterman and De Jong (2007), who stated that the relationship between risk factors, such as systemic hypertension, systolic or diastolic blood pressure, or perfusion pressures and POAG, remain controversial. And in the Beijing Eye study done on western societies by Xu, Wang and Jonas (2009) neither in univariate nor in multivariate statistical analysis, systolic blood pressure, diastolic blood pressure, mean blood pressure and ocular perfusion pressure were significantly associated with the prevalence of open-angle glaucoma. It holds true if the whole glaucoma was differentiated into a normal-pressure glaucoma group and a higher-pressure glaucoma group.

Published evidence indicates that diagnosis and presentation of glaucoma is an important factor for subsequent blindness and is associated with poor knowledge about glaucoma (Kooner, Alldoor, Chao & Adams-Huet, 2006; Sathyamangalam, 2009). Professionals in health and social welfare are concerned that lack of knowledge of risk factors of POAG could remain a major cause of why patients present late to eye facilities (Cross, Shah, Batival & Spurgeon, 2005).

The ocular hypertension treatment study (OHTS) showed that if high eye pressure is lowered by approximately 20%, then the probability of developing glaucoma over a period of 5 years is about 4%. If the eye pressure is not lowered, the probability of

developing glaucoma is about 9%, namely two fold more than if the condition were treated.

People with elevated IOP have an increased risk of developing glaucoma. Elevated IOP is usually defined as greater than 21 mercury (HG). However, even people with normal eye pressure can develop glaucoma.

All people who are at risk of developing glaucoma should have their eyes examined annually for early detection. Patients who are diagnosed with glaucoma should also inform blood relatives of their condition to alert them to their own potential for developing the disease. Blood relatives should be encouraged to undergo a comprehensive eye examination.

2.4 GLAUCOMA AWARENESS

Glaucoma awareness has been widely researched and described. Cross et al., (2005) hold the opinion that even with the most sophisticated technology to facilitate diagnosis, patients and their communities will not benefit if information is not communicated to them and that it is important to take advantage of new technology. To encourage regular screening, follow ups and compliance with treatments, the community needs to be informed about glaucoma, the benefits of early detection, and the detrimental effects of late presentation and late stage disease on quality of life and morbidity.

In a study done by Mansouri, Orgul, Meier-Gibbons and Mermoud (2006), it was found that only 9% of Canadians are aware of the fact that glaucoma is one of the leading causes of blindness. Half of the Canadians in the study did not have any knowledge of the symptoms of glaucoma and 74% were unaware of the risk factors. Another study done in Canada revealed that the majority of respondents (84%) were unaware that glaucoma leads to blindness thus it was concluded that patients demonstrated lack of knowledge or inadequate knowledge pertaining to glaucoma, its prevention and control (Silva, Temporin, Neustern & Araujo, 2005).

Hennis, Nemesure, Honankanen and Leske (2007) conducted a study on awareness of the incidence of open-angle glaucoma. They found that those with less than a college education were more likely to be unfamiliar with the disease.

A study conducted by Bodunde et al., (2006) revealed that overall 15.1% of the respondents had a family history of glaucoma and only 18.1% had heard of glaucoma before their diagnosis was made. Of these respondents, 93.9% wrongfully believed that they can recover from the illness after treatment. Could the difference in glaucoma about knowledge be explained due to socio-economic and cultural factors? People of African descent are not the only ones to have poor knowledge of the disease (Mansouri et al., 2006) and Livingston, Lee, De Paola, Carson, Guest and Taylor (2007) reported that a study that was conducted on the knowledge of glaucoma in the suburbs of Melbourne, Australia, showed serious deficiencies in basic knowledge on glaucoma. Seventy percent (70%) of the sample had heard of glaucoma but only 22% provided a description that demonstrated a reasonable

understanding of the disease. A lack of awareness and knowledge of glaucoma appeared to be negatively linked to self-care practices.

In a study done by Sathyamangalam et al., (2010) for urban and rural residents of Chennai in India, it was found that only 13.0% of the study participants were aware of glaucoma. Of those who have heard of the disease 68.0% could not describe the condition. Women and elderly had more awareness about glaucoma but education level also affects the glaucoma awareness. The author concluded that of the entire population under study only 8.7% had knowledge about glaucoma and that only 0.5% could be categorized as having good knowledge of the disease, 4% had fair knowledge of it, and 4.2% poor knowledge of it. Awareness and knowledge about glaucoma was very low among the urban population of Chennai. It was found that younger subjects and men were less aware of glaucoma. Subjects with lower levels of education were less aware and knew less about glaucoma than their counterparts. The findings in the study underscore the need for health education for effective prevention of blindness due to glaucoma (Sathyamangalam et al., 2009).

Adegbehinge and Bisiriyu (2008) reported on a study that was carried out to determine the level of correct knowledge about glaucoma and attitude towards blindness prevention and treatment, and how these factors influence self-care practices among teaching hospital workers (Drivers, Porters, Cookers, Clerk and technicians). They concluded that there is a gap in the knowledge and attitudes of glaucoma among Nigerian hospital workers, especially among the non-medical staff.

There is therefore a need for eye health promotion activities targeting all workers at primary health care (PHC) facilities.

To use resources most efficiently to enhance public awareness about glaucoma, subgroups of the population which are at higher risk both of developing the disease and of having insufficient knowledge about it, need to be identified and targeted. The successful treatment of POAG depends on awareness of the disease and optimal compliance with treatment by the patient. An aware and knowledgeable patient is in a good position to inform family members of the need to utilise screening services provided by eye personnel. This could diminish the morbidity, personal and economic burden of the disease if individuals are encouraged to undergo appropriate screening which could lead to early detection and therefore early treatment.

2.5 BARRIERS TO UPTAKE GLAUCOMA SERVICES

Barriers to utilisation of eye care services are also described in the literature. These barriers include cost, fear of treatment, lack of transportation, culture and belief, alternative eye care services, access and acceptance. Financial barriers are commonly cited as reasons why patients do not opt for ophthalmic surgery. Cost was identified by 915 (61%) of respondents out of 1500 respondents as the most important barrier to receiving cataract surgery (Gyasi et al., 2007).

Patients fear treatment because all surgery entails some risk, and the fear of a poor outcome can cause patients to refuse treatment. This fear is sometimes exacerbated by a poor understanding of the procedure, or by hearsay of surgeries having gone

wrong recently or even years earlier. Many patients from rural areas are afraid to report that they are experiencing vision problems because they believe myths that during surgical intervention doctors will take their eyes out and replace them with goat eyes. Furthermore some patients fear dying whilst undergoing surgery while others believe that a surgeon forgets the name of the patient whilst doing the surgical procedure and that if this happens then the patient will die. All these myths were associated with surgical outcomes during colonial times. These fears can be diminished by increasing health education on glaucoma among the community. A study done by Briesen, Geneau, Roberts, Opiyo and Courtright (2010) supports the above statement as they found that several people admitted that they had actually never met someone who had unsuccessful surgery but only heard rumours of poor surgery outcome.

The distance from clinics and hospitals creates a physical barrier to obtain eye care, which is not easily overcome since there is a lack of transportation services. This constraint is particularly applicable for those patients living in rural areas of Namibia. MOHSS (2008) found that 63% of patients walk to the nearest government health centres, while only 17% and 18% respectively use private or public transport. Hospitals are less accessible than other government health facilities. The mean time to the nearest government hospital is 37 minutes for urban households, compared with two and a half hours for rural households (MOHSS, 2008).

Harmony with one's culture is the key to health and wellbeing. Similarly, societal beliefs that getting cataracts is just part of ageing or God have will, act as barriers to

cataract surgery (Wearne, 2007). This belief is also common among community members from the Oshana Region who believe that blindness is a normal aging process and no intervention is needed.

Traditional and/or herbal eye care techniques 'pull' patients away from eye surgery as the former offer alternative treatment options. The main alternatives to regular eye-care services have been pharmacies and indigenous herbal medicine. There is an indication of relative inaccessibility of hospital eye services to the population. Reasons for this inaccessibility lead to the patients' inability to distinguish between the different providers, and their perception of the hospital and its staff (Ntim-Amponsah, Amouk & Ofosu-Amaah, 2005). Traditional herbs are not a major factor that 'pulls' patients away from the hospital in Oshana Region because there are very few cases of serious eye conditions caused by applying traditional harmful herbs at the eye clinic.

A study by Kovai, Krishnaiah, Shamanna, Thomas and Rao (2007) in India on accessing eye care services found that barriers to seeking treatment among those who had not sought treatment, despite noticing a decrease in vision over the past five years, were personal in 42% of the respondents, economic in 37% and social in 21%. In a study done by Lewallen and Courtright (2006) in Tanzania on increasing uptake of eye services by women it was found that they are less likely to be educated than men thus less likely to be aware that some blindness can be cured, to know where to go, and to know how to get there. Language barriers or unfamiliarity with the health system can lead to decreased awareness of health care services by some women.

Quality of life expectations in old age are gender-specific in some cultures and the perceived benefit of cataract surgery may be gender-dependent. For instance, elderly men expect and are expected to participate in community meetings; their involvement requires mobility. Women, on the other hand, may be more confined to the house (Lewallen & Courtright, 2006). Therefore women may not have correct information on eye care health and their level of glaucoma awareness is expected to be low in relation to their male counterpart.

2.6 EFFECTIVE HEALTH COMMUNICATION STRATEGIES AND AWARENESS RAISING

Information access is essential for increasing people's knowledge and awareness of what is taking place around them regarding health matters, which may eventually affect their perceptions and behaviour. It is important to know which groups of people are likely to be reached by the media for purposes of planning programs intended to inform people about health and family planning (MOHSS, 2008).

There are numerous methods to improve the prevention of blindness from glaucoma but early detections offer the most potential. To achieve this strategy there should be designs to screen the population and case findings. Population screening is the presumptive identification of individuals who might benefit from further diagnostic assessment of glaucoma by an ophthalmologist or optometrist, while case findings involve testing for glaucoma as opportunities arise in the course of clinical care, such as during periodic eye evaluations (Allighan, Shields & Freedman, 2005). Although population screening is highly desirable it does not appear to be cost competitive

with other competitive health care interventions due to scarcity of the resources. Thus preventive strategies to be effective would not just focus on the high risk individuals at the extreme of the distribution but would have to address the population distribution (Rose, Khaw & Marmot, 2008).

While it is generally acknowledged that the majority of diseases are either treatable or preventable in developed countries, most developing countries lack advanced medical training and technology prevalent in westernized countries. However, it is possible for the level of awareness of preventable diseases to be increased with health communication models and systems that have been created for developing countries (Johns Hopkins School of Public Health, 2010). Unfortunately, this is often not the case. A case study on HIV/AIDS in South Africa shows that posters designed to increase awareness and change people's behaviour towards the virus lack integral components from a communication perspective (Beaudoin, 2007). A program that focused on reproductive health in Zambia used television to increase condom use with positive results (Rossem & Meekers, 2007). However, using television to raise awareness in Oshana Region communities would not be applicable because the majority of people do not have access to television.

There have been studies conducted to try to discover the best communication channels to reach Ghanaians. In a study on the implementation of vitamin A regimen in a Ghanaian village, a significant result of the research was the determination of the best manner to communicate with rural Ghanaians. Overall, it was determined that radio is the best communication medium because, although many Ghanaians do not

personally own a radio, most have access to one. In addition, ‘town criers, radio, posters, church, mosque and market announcements, loudspeaker vans and a song, were more popular and effective channels of health communication than community groups, television, movies, videos, healthcare personnel, billboards, newspaper and school (Hill, Kirkwood, Kendall, Adjei, Arthur & Agyemang, 2007). Although there is no documented study done in Oshana Region to determine the best way to communicate with Oshana communities it is suggested that the use of radio would best communicate health related topics because the majority of Oshana residents have access to radio. This could be done by conducting radio interviews with eye care personnel during weekdays to reach listeners who do not work during the day. The recorded interviews could then be repeated over weekends to provide working listeners with an opportunity to also listen to health messages.

Setting up screenings at places that people frequent visit, such as shopping malls, could also be effective for raising community awareness in Oshana Region. However it is unclear who would be willing to do this.

It has been determined that the best communication strategy for developing countries is based on the idea of integration with the community. The principle of inclusion, participation and self-determination helps defeat the major problems seen with solely increasing comprehension of why certain health behaviour is wrong (Ford, Williams, Renshaw & Nkum, 2005). These authors argue that allowing people to have input on health information would help them change by as they could collectively discuss different communication channels to be used and set goals for desired change which

should provide leads to taking responsibility to bring about health communication behaviour change (Ford, Williams, Renshaw & Nkum, 2005).

Community involvement is importance. Such involvement can help to ensure that socio-cultural norms and customs are recognised and respected. Once community members are invested in a community health workers program, they must be involved in nominating candidates to become community health workers (CHW). Doing so increases the likelihood that CHW candidates, who are respected members of the community, would be effective communicators, educators and service providers in terms of being partners in health. The most suitable candidates to become CHWs in Oshana Region are PHC committee members and regional councillors, respectively. These people are very influential and can help in awareness raising.

The Zambian blindness prevention program formulated its strategies to increase glaucoma awareness and detection in their National Eye Health Strategic Plan which includes:

- encouraging ophthalmologists to undertake detailed assessments of the eye;
- training primary health eye workers to help in early detection of glaucoma;
- raising public awareness on glaucoma (Ministry of Health-Zambia,2007).

In the Oshana Region these strategies could also be used by encouraging OMAs to screen every patient who is above 40 years for glaucoma. In addition nurses who are working at PHCs could be trained in basic ophthalmology in order to sensitize the community on the importance of annual glaucoma screening.

IEC, namely information, education and communication, can be defined as an approach which attempts to change or reinforce a set of behaviours in a target audience regarding a specific problem in a predefined period of time. IEC is a very strong tool in the improvement of the life styles of people and their health. Health promotion and health education (HE) activities rely on a variety of well designed and effective IEC materials to help ensure success. From experience, certain fundamentals pertaining to the development of IEC materials are obvious. Every brochure, poster, video tape or other examples of IEC material are the product of a decision, supported by research, to deal with a specific health concern so that the message will be well received and persuasive among a specific health concern audience.

Accurate information provided prior to eye screening can help alleviate fear and anxiety associated with screening and early treatment. At the eye clinic there are no IEC materials on blinding conditions and at the IEC Division in Windhoek there are no videos on eye blinding conditions. Cherie, Mitkie, Ismail and Berhane (2005) found that over three quarter of the respondents believed in the usefulness of IEC. Such materials were perceived to be useful in increasing the respondents' knowledge about HIV/AIDS by 51 % (n=456), to influence attitude by 40% (n=357) and to acquire safe sexual practices by 42% (n=382). Information should not only be shared at health facilities but also at community points where people meet, such as at churches and other gatherings, like traditional rituals and ceremonies. Traditional healers who are treating eye conditions need to be given posters and brochures on glaucoma blindness in order to gain more insight on the condition.

Based on the findings of their study on eye health promotion and the prevention of blindness in developing countries Hubley and Gilbert, (2006) highlight critical issues. These being service improvement in terms of the quality of information provided to patients to promote adherence to treatment regimes and follow up and the need to increase public awareness of possible side effects and action needed to prevent recurrence. Implementing patient education in a resource poor setting with crowded clinic based health education program in Gambia was found to have a disappointing impact on levels of eye infection. Glaucoma involves explaining a complex health problem and the essential need to adhere to a regime of self administered eye drops, or to accept surgery. Evaluation of a clinic based educational program among 50 glaucoma patients in Brazil showed a significant improvement in all steps of eye drop instillation. However the evaluation did not show any improvement in knowledge of glaucoma, the concept of intraocular pressure, nor the purpose and importance of medication.

2.6 CONCLUSION

This chapter emphasized the importance of a literature review in identifying concepts and studies on awareness of glaucoma in the early stages in order to develop a research proposal or project. The literature review enabled the researcher to build on the basis of existing knowledge and on what other scholars have achieved as well as to identify areas that allowed new questions to be explored. In chapter 3, research design and methodology will be discussed.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter explained importance of literature review. Literature review helps the researcher not to repeat what has already been done, and to have more confidence that the contribution to knowledge is indeed a contribution. Research design and research methodology which includes the setting, research population, sample and sampling technique, data collection, data analysis and ethical considerations, are presented in this chapter.

The researcher undertook quantitative explorative descriptive study to describe and better understand clients' awareness regarding glaucoma blindness in order to gain more information about the awareness of glaucoma among clients visiting IHO. Quantitative research methodology relies upon measurement and uses various scales. A numerical form of a coding system allows for comparison of different cases and different variables. This method of coding data has an advantage of being exact and the numerical data can be analysed using descriptive and inferential statistics (Bless, Higson-Smith & Kagee, 2006). "Quantitative research" A Dictionary of Nursing (2008,p.1062) defines quantitative research as "a research based on traditional scientific methods, which generates numerical data and usually seeks to establish causal relationship between two or more variables using statistical methods to test the strength and significances of the relationship".

Quantitative research design is an excellent way of finalizing results and testing a hypothesis. It is more precise as quantitative research questions tend to be closed and very structured in nature. In quantitative research every variable should have an operational definition that specifies how the variable was measured (Macnee & McCabe, 2008).

3.2 RESEARCH DESIGN

A research design is a blue print for conducting a study that maximises control over factors that could interfere with the validity of the findings. It simply means a plan that describes how, when and where data are to be collected and analysed (Burns & Grove, 2005). The design identifies how subjects will be recruited and incorporated into a study, what will happen during the study, including timing of any treatments and measures and when the study will end (Macnee & McCabe, 2008). Research methodology is a design that clearly defines structures within which the study is implemented (Burns & Grove, 2005).

In this study, a quantitative approach, using exploratory and descriptive research design, was deemed appropriate to explore and describe a client's awareness of glaucoma. The exploratory study is the study which is conducted when the information about a specific topic is not available (Burns & Grove, 2005). The design was exploratory as it allowed the researcher to gain a broad understanding of clients' awareness of glaucoma as a disease and its consequences, namely blindness. Descriptive study is define as a way of discovering new meaning, describing what exists, determining the frequency with which something occurs, and categorizing

information (Burns & Grove 2005). The design was descriptive, as the researcher was interested in glaucoma awareness meaning which could be used in a language that would be understood by clients when they came to the hospital for treatment. Therefore the study describes what clients know about glaucoma and early detection thereof.

3.3 RESEARCH SETTING

The study was conducted at the Intermediate Hospital Oshakati (IHO) in the OPD. A consulting room was selected to interview clients between 08h00-11h00, while the doctors were attending to in-patients. The daily OPD duties of the doctors were not compromised since they were elsewhere in the hospital during the times of the interviews.

The OPD is a unit in the hospital which comprises 30 consulting rooms for all cold cases. It is where patients seek consultations with attending doctors. In addition patients referred from other district hospitals outside Oshana Region and patients who are referred from clinics within Oshana Region are attended to in the OPD. Weekly service delivery is from 08h00 to 17h00 and the monthly attendance statistics obtained from the attendance register show an average of 6304 new patients and 4,255 follow- up cases attend the OPD. Service delivery is offered to persons with different medical conditions who are 18 years or older (Intermediate Hospital Oshakati Health Information System [IHO-HIS], 2009). According to the statistics consulted 711 patients (11%) required eye care treatment. This figure is very high because the patients were not all residences of Oshana Region; it was difficult to

ascertain how many patients were from the Oshana Region because the attendance register does not have the column to indicate the region of clients.

3.4. RESEARCH POPULATION

A population relates to the entire set of data that is of interest to a researcher (Wisniewski, 2006). For this study the population comprised of adult men and women who required treatment by doctors in OPD as well as people between the age of 40 and 70 years who accompanied their relatives to the hospital. The population included new patients and follow-up patients.

3.5. SAMPLE AND SAMPLING TECHNIQUE

A simple random sampling method was used. Simple random sampling is a procedure of selecting a probability sample where each element of the sampling frame has known equal probability of selection (Blanche, Durrheim & Painter, 2005). Simple random sampling was used because the study population is homogenous and any sample drawn was unlikely to be seriously biased.

The sample size consisted of 400 respondents (participants). The sample size that was selected constitutes 6.4% of 6,304 clients that attend OPD monthly. The sample size was determined by using published tables which provide the sample size for a given set of criteria. This was drawn from Census (2001) as there are 97149.6 inhabitants of Oshana Region.

The first 15 male or female clients between 40 and 70 years who were in the waiting room were each given a number after they were told of the interview and reasons

thereof. This sampling method was used to obtain sufficient respondents (n=400), which is representative for Oshana region. The inclusion criteria were that the clients had

- to be between the ages of 40 and 70 years;
- to be attending the OPD;
- to be fluent in Oshiwambo;
- to be willing to participate in the study;
- to be a resident of Oshana Region.

The exclusion criteria were:

- clients younger than 40 years and older than 70 years;
- clients not fluent in Oshiwambo;
- clients who were not residents of Oshana.

The rationale behind the selection of the specific age group was that those clients above the age of 40 are at risk of developing glaucoma. Participants who were older than 70 years were excluded because it was thought that they may not have understood the questions well.

3.6. DATA COLLECTION

3.6.1 Data-collection instrument

In this study a structured interview was used to collect data. A structured interview involves having a fixed, rather than flexible, approach to gather information (Polit & Beck, 2007). Structured interviews include strategies that provide increasing amount of control by the researcher over the content of the interview. This research tool was

selected because it offers a degree of flexibility and interaction between the data collector and the respondents which is not always possible in the case of a questionnaire handed to a respondent. The advantage of this method is that it provides an opportunity for the interviewees to give more detailed personal information thus the data collected is rich and full of contextual information. In this study the data collector did not deviate from the questions listed in the interview tool (Appendix 1) but some respondents added more valuable information on their own and without probing. Face to face interviews allow an interviewer to note social cues, such as voice, intonation, body language of the interviewee. An interviewer can obtain more information from such social cues that could be added to the verbal answer given by a respondent.

Questions asked by the interviewer are designed by the researcher before the initiation of data collection, and the order of the questions is specified (Burns & Grove, 2005). The purpose of the interview in this study was to discover and gain more information about the awareness of glaucoma by clients who visit the OPD of IHO. This was important because each respondent's own framework of meanings was discovered and the researcher avoided imposing his own assumptions as much as possible. The researcher asked the same questions to the participants in a precise manner, offering each individual the same set of possible responses.

3.6.2. Development of instrument

Validation is a crucial step in the development of an instrument because validity is the extent to which instrument measures what is intended to measure. Glaucoma risk

factors questionnaire and determinants of glaucoma awareness and knowledge in urban Chennai questionnaire were used as reference to compile the instrument (Medical New Today, 2008, Sathyamangalam et al., 2009). The construct is based on glaucoma awareness.

The preliminary structured interview with interview guide was developed by the researcher. The researcher identifies the content domain using internet search. The criteria were then organised in the following interview guide tool, biographic data, such as age, gender, employment status and educational background; knowledge and specific awareness raising strategies. The interview schedule was then presented to the main supervisor who suggested that the schedules be presented to experts to the field of study

3.6.2.1 Validity and Reliability

Validity

Validity means ability to produce findings that are in agreement with theoretical or conceptual values. In other words to produce accurate results and to measure what is supposed to be measured (Lee & Lings, 2008).

Content Validity

The preliminary instrument for the study was presented to OMAs, ophthalmologist that are working at eye clinic of IHO and National Blindness Prevention programme manager in Windhoek. The researcher asked these experts in ophthalmology to give their opinions on the validity of the tool. My initial plan was to interview glaucoma

patients that are attending at the eye clinic, but experts changed it and advised the researcher to interview clients who are attending at OPD of IHO. The reason is that glaucomatous patients should have already been aware of glaucoma. The National Blindness prevention programme manager removed questions relating to eye doctor appointment and years when last respondents had eye test, because he felt that respondents might have difficulty to remember their last date of eye test and to differentiate between eye doctor and general doctor.

Criterion validity

The researcher obtains information from already published articles in the internet on glaucoma knowledge and awareness and came up with final research instrument.

Reliability

Reliability is another important characteristic of a research instrument. Reliability refers to the ability of an instrument to produce consistent results (Lee & Lings, 2008). This was ensured by using an already existing instrument, the glaucoma risk factors questionnaire and determinants of glaucoma awareness and knowledge in urban Chennai, as basis for compiling the instrument. Interrater reliability was not considered because data were collected by the researcher.

3.6.3 Pre-testing of the instrument

A pre-test study is commonly defined as a smaller version of a proposed study conducted to refine the methodology (Burns & Grove, 2005). It is developed much like the proposed study, using similar subjects, the same setting, the same treatment,

and the same data collection and analysis techniques. Therefore in this study a pre-test was conducted with 30 clients between the ages of 40 to 70 years who attended the OPD of Outapi District Hospital in the Omusati Region. These pre-test participants were not involved in the final study. The major problems encountered during pre-testing of the research tool, was that, respondents were having difficulty to differentiate between symptoms and signs of glaucoma and some were having difficulty to draw lines between family members and relatives. Most people whom they refer to family members were rather relatives. This has assisted the researcher to clarify signs and symptoms of glaucoma to the respondents and who are the family members are referred to (father, mother, brothers and sisters) during the main study. Changes that were made to the interview guide are questions that ask about marital status of the respondents and whether respondents are living alone. The researcher deleted these questions because he felt that it was personal. Pre-testing of the research tool provided the researcher with an opportunity to evaluate issues such as:

- length of time to be taken for each interview
- interview techniques to elicit information
- flow of interview based on the responses and possible comments that could be made by participants
- irrelevant aspects that should be removed from the measuring instrument

3.6.4. Data collection method and process

Data collection is a process of selecting subjects and gathering data from these subjects (Burns & Grove, 2005). Informed consent (verbal) was obtained from the respondents before interviews commenced. The purpose of the study was explained,

with emphasis on the fact that refusal to participate would not affect their future treatment. A quiet room at the OPD of IHO was selected for conducting of the research interviews. Respondents were assured of confidentiality and privacy. The duration of the interview was between 5-15 minutes. Data were collected from one respondent (participant) at a time and fifteen respondents were assessed per day. During the interview, encircling of responses on the interview guide tool was done by the researcher, to enrich the data collected and also for recording information accurately.

Potential respondents were approached by the researcher and invited to participate in the study. Before commencing the interviews, clients were asked their age to make sure that they were within the inclusion criteria of 40 years to 70 years. They were given a number as their personal code. Exclusion criteria as detailed in 3.5 were adhered to. Interviewees were briefed about the nature of the questions however the terminology used was based on the sub ethnic language spoken at home, like Oshindonga, Oshikwanyama and Oshikwambi, due to use of different terms according to their origin or sub ethnicity.

All respondents were asked to answer all questions to the best of their knowledge. The interview material was administered by the researcher. Permission was obtained from each respondent for the researcher to encircle their replies on the research tool (Appendix 1). The researcher asked the same questions in a precise manner, and offered each respondent the same set of possible responses. The survey was

designed to ask questions about knowledge of glaucoma, the importance of IEC materials on glaucoma and raising awareness strategies for glaucoma.

3.6.4.1 Biographic data

Respondents were asked to give data about their age, gender (male or female), employment status (employed, not employed and retired) and educational background (tertiary, secondary, primary and no education), but not their names or other personal information.

Other studies have shown the link between rural/urban and knowledge of glaucoma, like the study done by Sathyamangalam et al. (2009) who concluded that awareness and knowledge of glaucoma was very low among the urban population of Chenani. Thus for the purpose of this study it was deemed not necessary to reconstruct this information in the research tool.

3.6.4.2 Awareness and knowledge about glaucoma

Respondents were first asked whether they had ever heard of glaucoma or seen somebody with glaucoma and to describe it. Then they were given a list of four known risk factors and signs and symptoms of glaucoma and asked to choose which ones they knew to be risk factors and signs and symptoms for glaucoma. The followings risk factors were presented in interview guide: age over 40 years, family history of glaucoma, high eye pressure and trauma. The signs and symptoms options presented in the interview guide were big eyes, increased intraocular pressure, loss of peripheral vision and diminished visual acuity. The researcher read out the choices to each interviewee and circled the choices that were mentioned.

Other ways of determining knowledge were whether people knew they could become blind from glaucoma, and whether one can have glaucoma without having symptoms.

3.6.4.3 Defining knowledge levels of glaucoma

A respondent was considered to have good knowledge if he/she was able to identify the risk factors for glaucoma such as increased IOP, family history and was further able to describe the condition and identify signs and symptoms. Fair knowledge was considered if at least two of the risk factors as well as signs and symptoms were identified. Poor knowledge meant that a respondent could not identify a single risk factor or sign and symptoms for glaucoma.

Importance was given to the risk factors and the description was 'increased eye pressure and loss of peripheral vision'. If a respondent gave a clear description of glaucoma but was unaware of the risk factors the researcher felt knowing risk factors was more important for the purpose of analysis of collected data and more importantly, to use this data to target people who may need more education.

Respondents were also asked their personal history of glaucoma, whether they had been previously screened for glaucoma and if so to state whether the screening was undertaken by a doctor, an OMA, or an optometrist.

3.6.4.4 Effective health communication and awareness raising strategies

Respondents were asked whether IEC materials are useful in increasing awareness about glaucoma and whether these materials should be placed in community meeting points, schools, churches or health facilities so that they can be easily accessible to every community member. As stated in the introduction IEC materials help community health workers and volunteers to conduct sessions with the communities and to disseminate correct information related to glaucoma.

Respondents were also asked to state specific awareness raising strategies that would be necessary to increase glaucoma awareness in the Oshana Region. Strategies mentioned were radio, effective health communication, and population screening.

3.7 DATA MANAGEMENT

The researcher brought structure and order to the mass of data through organisation and management. During interviews, field notes were not taken by the researcher. In this study the researcher informed the participants prior to the interview that notes would not be taken but only their responses would be circled on the hardcopy of the research tool.

3.8 DATA ENTRY

Data were entered into the computer by the researcher who used the Epi Info software program.

3.9 DATA ANALYSIS

Data analysis is conducted to reduce, organise, and give meaning to data. In this study the researcher used descriptive statistics. Tables and graphs were used to present findings of the study and *EPI Info*, a computer program for statistical analysis, was used in data analysis. Data were collected and analysed simultaneously so that questions that remained could be addressed before data collection was over. Data analysis was done by the researcher after all data of the 400 completed interview guide were captured using the abovementioned software. No statistician was involved.

3.10 ORGANISATION OF DATA

All data were organised according to subsections as detailed in structured interview guide. The researcher sticks all interview guide tool with different colour sticker which help to sort out information like gender, employment status, educational background and age group. Tables were made and data were arranged by their class interval. Bar graphs and line graphs was constructed for proper data organisation.

3.11 RESEARCH ETHICS

Ethical measures were adhered to throughout all phases of the research through the following measures which recognised and protected the rights of the informants:

- prior to conducting the research, the researcher entered into agreement with respondents to explain the nature of the research and the responsibility of each participant
- clients who participated by answering the questionnaire were all volunteers and were fully informed of the nature of the research
- clients who participated had the freedom to withdraw from the program at anytime without any penalty
- anonymity and confidentiality of the participants were protected and the identity of the subjects could not be linked to the data given. Private information would not be divulged without the prior authorisation of the participant. The anonymity of the informants was protected by giving each a code number
- approval for the study was obtained from the University of Namibia and the Ministry of Health and Social Services (MOHSS).

3.12 CONCLUSION

This chapter defines what the activity of research is, how to proceed with research activity, how to measure research progress and what constitutes research success. It also discussed the research design and methodology, including research approaches, research setting, population, sample and sampling technique, data collection, data collection instruments, pre-testing of the data collection instrument and ethical considerations. A quantitative, descriptive and explorative study was used.

Chapter 4 discusses data analysis and findings.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

4.1 INTRODUCTION

The previous chapter discussed research methodology used. This chapter presents the key findings of the main sections elaborated in the first chapter, under the research problems, objectives and research questions. The specific purpose of this study was to provide analytical evidence that could be used to increase awareness of glaucoma among Oshana Region's residents.

Information provided by the respondents was classified according to the sub sections in the interview tool guide, denoting glaucoma awareness level of clients who were at the OPD (out patient department) of Intermediate Hospital Oshakati (IOH).

4.2 RESULTS

There were four hundred respondents (n=400) in the study. The data of the study are presented next page in graphs.

4.3 SECTION A: BIOGRAPHIC DATA

Table 1: Biographic data.

B-D characteristic	Number	Percentage (%)
1. Age		
40-44 years	56	14.0
45-49 years	52	13.0
50-54 years	54	13.5
55 and above	238	59.5
Total	400	100.0%
2. Sex		
Male	160	40
Female	240	60
Total	400	100%
3. Employment status		
People who are full employed	89	22.3
People who are not employed	259	64.8
People who are retired	52	13.0
Total	400	100%
4. Educational background		
People completed tertiary education	18	4.5
People completed secondary school	61	15.25
People completed primary school	88	22
People didn't completed primary school	178	44.5
People never attended formal school	55	13.75
Total	400	100%

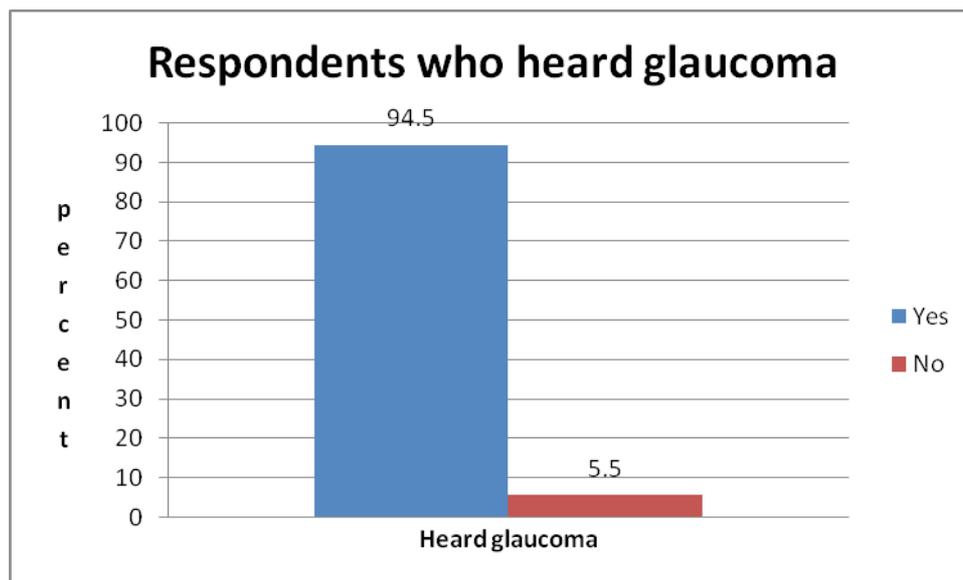
Table 1 shows age distributions, female to male ratio, employment status and educational background. The minimum age was 40 years and the maximum was 70 years and 4 months. Interpretation of the data reveals that 59.5% of the respondents were between 55 years to 70 years old; 40.0% were males and 60.0% were females; 22.3% of respondents were employed full time, 64.8% were unemployed and 13.0%

had retired since they were older than 60 years of age; 4.5% of the respondents completed tertiary education, 15.25% completed secondary school, 22% completed primary school, 44.5% didn't completed primary school and 13.75% never attend any formal school.

4.4 SECTION B: KNOWLEDGE

1. Have you ever heard of glaucoma?

Figure 4: Depiction of respondents who heard of glaucoma



As illustrated in Figure 4 there were 5.5% (n=22) respondents who stated they had never heard of glaucoma whereas 94.5% (n=378) said they had heard of glaucoma before taking part in the study but could not describe the condition.

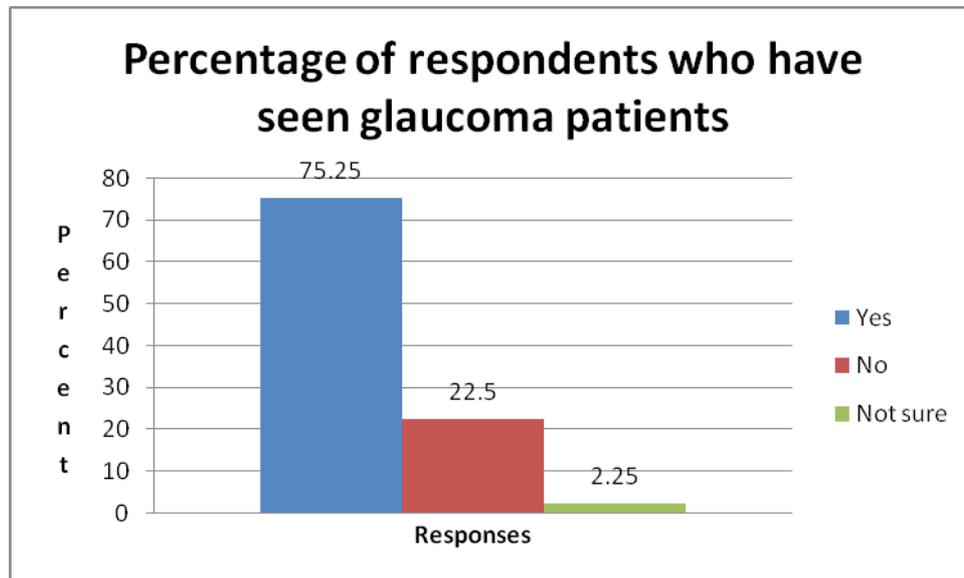
In this study 94.5% (n=378) of respondents had heard of glaucoma and are aware about glaucoma being a blinding eye condition. This is consistent with the findings of Cross, Shah, Batival and Spurgeon (2005) who found that 67.0% participants in

their study had heard of glaucoma before taking part in the research. Most respondents who reported that they heard about glaucoma were not really referring to glaucoma but meant end stage of glaucoma, namely blindness. This was the observation of the researcher. This may be due to the widely used term for glaucoma in any of the languages spoken in this study area as being when a person's eyes are open but cannot see. This knowledge was derived mostly from family experience.

For the purpose of this study the researcher understood a respondent to be aware of glaucoma if there was a positive reply to the question 'have you ever heard about glaucoma' or if the reply was perhaps that glaucoma is higher pressure, glaucoma is high eye pressure causing blindness, or glaucoma is high eye pressure causing damage to the eye nerve.

2. Have you ever seen people with glaucoma?

Figure 5: Graph showing respondents who have seen or not seen somebody with glaucoma.



Seventy five point twenty five percent (n=301) of participants had seen people with glaucoma; 22.5% (n=90) had not seen people with glaucoma, and 2.25% (n=9) were not sure whether they had seen people with glaucoma.

In this study 75.25% of the respondents had seen people with glaucoma. Actually what they had seen was people who are totally blind. Most of the respondents stated that when they were young they had seen old people with glaucoma and were informed by elders that people with glaucoma have eyes wide open but cannot see.

The majority of respondents had seen people blind from glaucoma in their villages which indicates glaucoma blindness is higher in this community and control measures need to be instituted in order to stop further loss of vision.

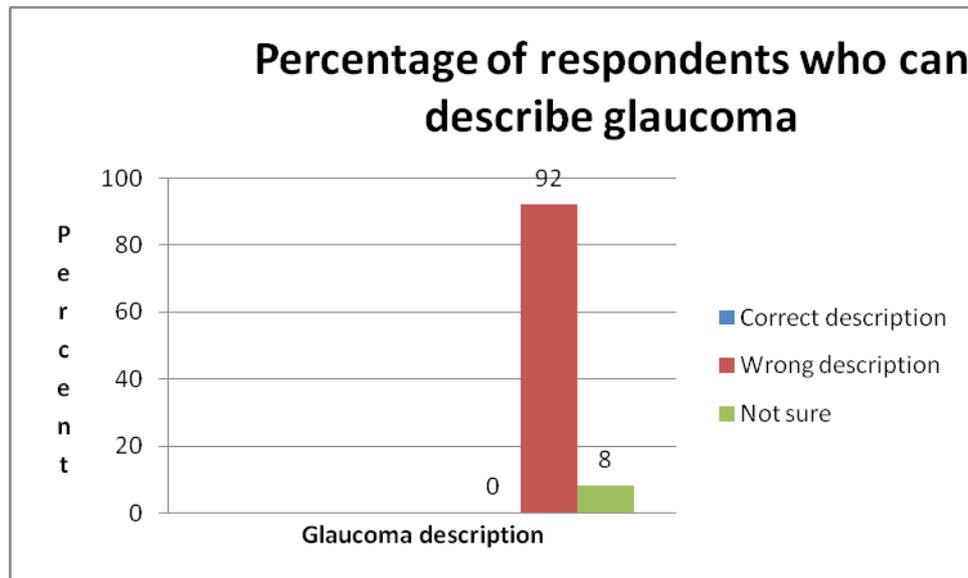
One of the biggest challenges with glaucoma is that, in most cases, it is an asymptomatic disease. It rarely causes pain or symptomatic vision loss until late in the course of the disease. When patients first notice field vision loss, substantial

glaucomatous cupping has already occurred. Vision loss begins with peripheral or side vision. One may compensate for this unconsciously by turning one's head to the side thus may not notice anything is amiss until significant vision is lost. Vision loss from glaucoma is not reversible (Gonzalez, 2007). The best way to protect your sight from glaucoma is to get tested.

Glaucoma is a disease of elevated intraocular pressure leading to optic nerve cupping and visual field loss. Elevated intraocular pressure is defined as a pressure greater than 21 mm Hg and may occur in as much as 15 % of the elderly population.

3. How would you describe it?

Figure 6: Graph showing percentage of respondents who could describe the condition and who gave wrong description of glaucoma



Not a single respondent (0%) gave the correct description of glaucoma; 92.0% of respondents (n=368) gave a wrong description of the condition that eyes widely open but cannot see (normal looking eyes but cannot see). It was poor that a total of 92.2% (n=368) of respondents did not have any (correct) association of glaucoma as this finding compares less favourably with other studies in industrialized nations (Hennis, Wu, Nemesure, Honankanen & Leske, 2007).

N=32 (8%) did not have any idea of a glaucoma description.

The description of glaucoma given by respondents varied as 92% described glaucoma as wide open eyes but cannot see, or healthy looking eyes but cannot see. This is how the people who reside in the study area refer to glaucoma but they do not know what really causes the eye to appear normal but it cannot see anything. The most accurate description, such as a build up of pressure due to lack of drainage, was not mentioned at all.

The findings of this study are in keeping with that of a study done in Switzerland in which 76.0% of respondents did not have any (or correct) association with the term glaucoma. Only 24.7% of those interviewed could describe glaucoma as an eye condition as described in the literature (Mansouri, Orgul, Meier-Gibbons & Mermoud, 2006). This finding reveals that glaucoma awareness is a major problem in both developing nations and developed nations. Intensive work needs to be done to reverse these situations.

Several studies reported that glaucoma awareness is low. In the Barbados eye condition group it was found that 53.0% were unaware of glaucoma. A German survey on knowledge of glaucoma, in an unselected population, found that 51.0% of the population had an active knowledge of the term glaucoma and 75.0%, had a passive knowledge of the term. Only 8.4% correctly recognized a basic glaucoma definition.

The findings of this study are consistent with the study done in the Netherlands by Hoevenaars, Schouten, Van den Borne, Beckers and Webers (2005), in which 51.0% of the patients obtained 49.0% or less for correct answers to questions about glaucoma or its treatment. In order to evaluate the knowledge glaucoma patients have about the disease and its treatment a study was done at the Glaucoma Service of Wills Eye Hospital (Philadelphia, United States of America) and at the Glaucoma Service of University of Campinas (Campinas Brazil) by Costa, Spaeth, Smith, Uddoh, Vasconcellos and Kara-Jose (2006). The study found that in Philadelphia 44.0% of the patients did not have an acceptable idea of what glaucoma is; the

situation was worse in Campinas as 54.0% gave unsatisfactory answers to the questions “what is glaucoma?”

Tenkir, Solomon and Deribew (2010) in their study found that only 2.4% of people are aware of glaucoma among those attending outreach ophthalmic services in South-Western Ethiopia which is similar to that in urban populations (2.3%).

A Nigerian study conducted at Guinness Eye Centre Onitsha reported that 10 (19.2%) patients did not have any knowledge of glaucoma. Only 41 (78.9%) patients were aware that glaucoma leads to irreversible blindness (Nwosu, 2010). A comparison of glaucoma awareness in European countries and African countries reveals that the European countries percentage of awareness ranged from 49 to 53% while in African countries the range was from 2.4 to 19.2%.

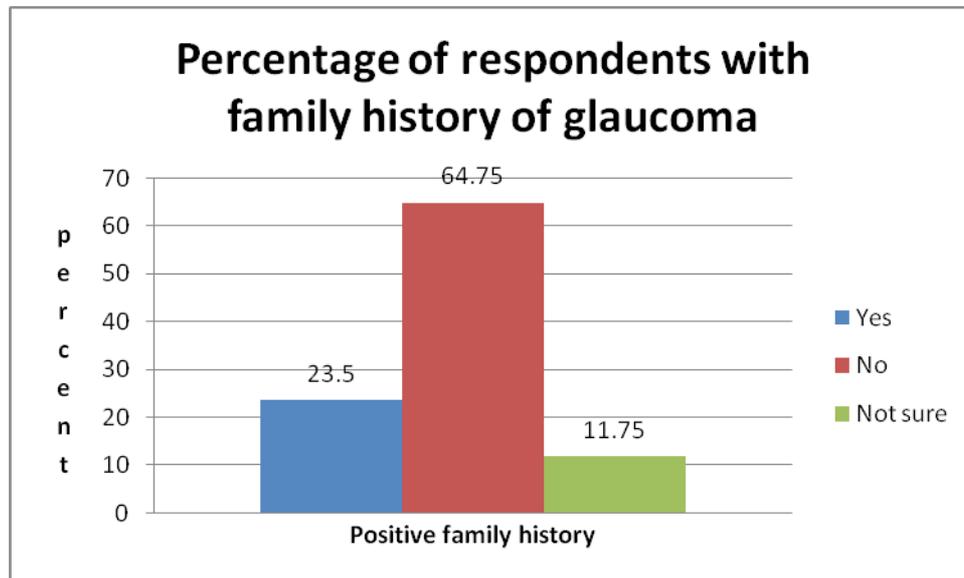
In this study not a single respondent (0%) knew that glaucoma was high eye pressure causing damage to the eye nerve. Thus, even though most had heard about and had seen people blind from glaucoma, their level of knowledge is low. These findings bring to fore the importance of adequately educating people about common eye diseases, especially glaucoma. Studies in Germany and Switzerland reveal the findings to be consistently higher than that of studies in Africa but this is not surprising as the European countries have more established eye care systems than in Nigeria, Ethiopia and Namibia, for example.

Lack of glaucoma awareness could constitute a barrier to participate in glaucoma services. A study carried by Dhaliwal and Gupta (2007) in India revealed that not knowing another person who had undergone cataract surgery was a barrier in 26% of their respondents. Galo (2005) found that in Kenya the main reason why people failed to undergo cataract surgery was lack of awareness. It is apparent from the above that creating awareness and improving patients' knowledge of common eye diseases is likely to increase their willingness to make use of ophthalmic services.

It is surprising that almost every respondent in this study had been informed about glaucoma by relatives or villagers. This finding shows that there is an urgent need for eye care providers, most especially in the northern part of Namibia, to redouble their efforts to adequately inform and educate the community. Not only must community members be made aware of the existence of eye disease but they must also be enlightened on how to go for screening and where to access counselling services and treatment.

4. **Do you have family members with glaucoma**

Figure 7: Graph showing respondents with family history of glaucoma.

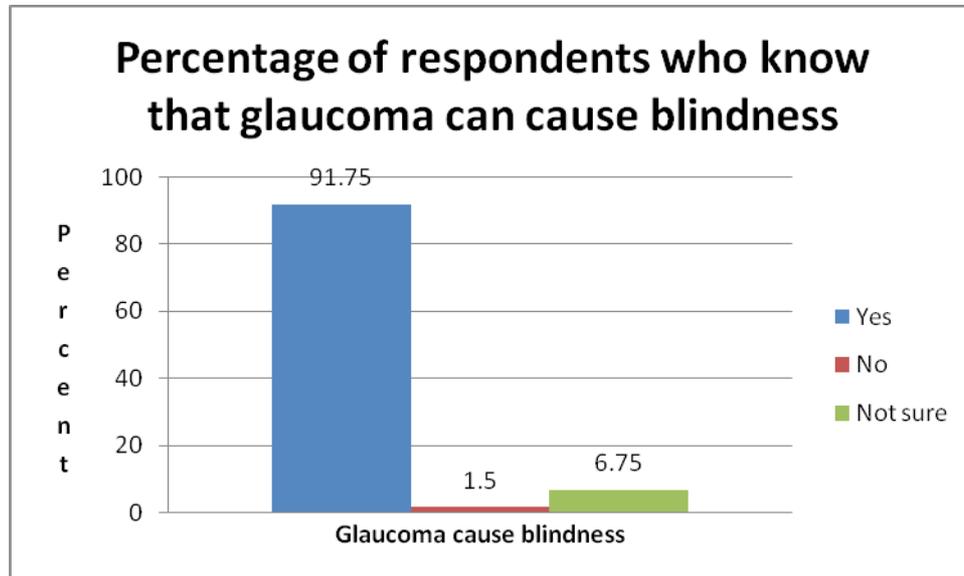


According to the responses from the respondents 23.5% (n=94) had family members with glaucoma, 64.75% (n=259) did not have family with glaucoma, and 11.75% (n=47) were not sure whether they have family with glaucoma.

Several studies reported that there was a strong association between glaucoma awareness and a family history of glaucoma (Bondunde et al, 2006; Sathyamangalam et al., 2010). Individuals with family members with glaucoma may be energised to search for more information. In addition, glaucoma patients may contact family members or, family members may bring patients in for their eye appointment and gather information from their eye doctor.

5. Can people go blind from glaucoma?

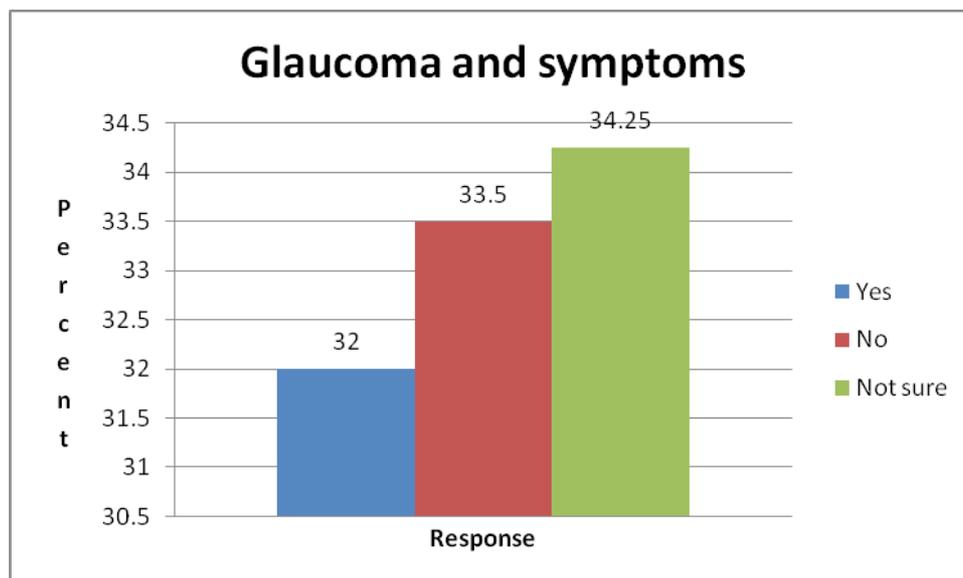
Figure 8: Graph showing percentage of respondents who know that glaucoma can cause blindness.



The majority of respondents 91.75(n=367) were aware that glaucoma can cause blindness whereas 1.5 %(n=6) did not know and 6.75% (n=27) were not sure that glaucoma can cause blindness. Ninety one point seventy five percent (n=367) of respondents in this study replied positively to the question ‘does glaucoma cause blindness’. The percentage is very high because all people seen by respondents who reportedly have glaucoma were totally blind. It is difficult for a lay person to recognize that a person has glaucoma until such time the person is rendered completely blind from increasing eye pressure which damages the optic nerve. In other words for the respondents glaucoma is equal to blindness.

6. Can one have glaucoma without having symptoms

Figure 9: Graph showing percentage of respondents that are aware, not aware and not sure whether one can have glaucoma without being aware of the symptoms.



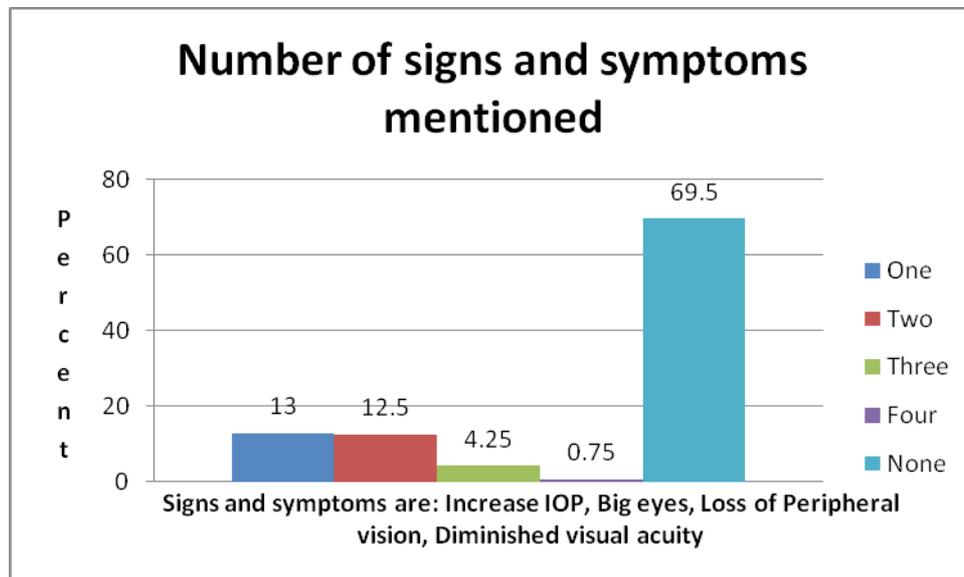
One hundred and twenty eight (n=128) of respondents, namely 32.0% correctly said that people can have glaucoma without having symptoms. Respondents who did not know that one can have glaucoma without being aware of symptoms (n=135) 33.5% and those who were not sure that one can have glaucoma without being aware of symptoms (n=137) 34.25%

Thirty two percent (32.0%) of the respondents stated 'yes' to the question 'can one have glaucoma without being aware of symptoms'. Although this question was very tricky and difficult to answer by people who do not know any sign and symptoms of glaucoma, 32.0% of the respondents gave a correct answer. This could be due to the fact that it is commonly held belief that if one has any eye conditions then she/he needs to have pain and red eyes and the eyelids should be completely closed. But in

POAG there is neither pain nor redness. There is only painless loss of vision starting with peripheral loss with increased IOP and damage to the optic nerve. Glaucoma symptoms can only be detected at the late stage of the disease; signs can only be detected by simple screening by eye care personnel. Therefore it is important for every individual to go for annual eye check after the age of 40 years and above.

7. How many of the following do you know to be signs and symptoms of glaucoma?

Figure 10: Graph showing percentage of respondents who mentioned 1 to 4 signs and symptoms of glaucoma i.e. big eyes, increased IOP, diminished visual acuity and loss of peripheral vision



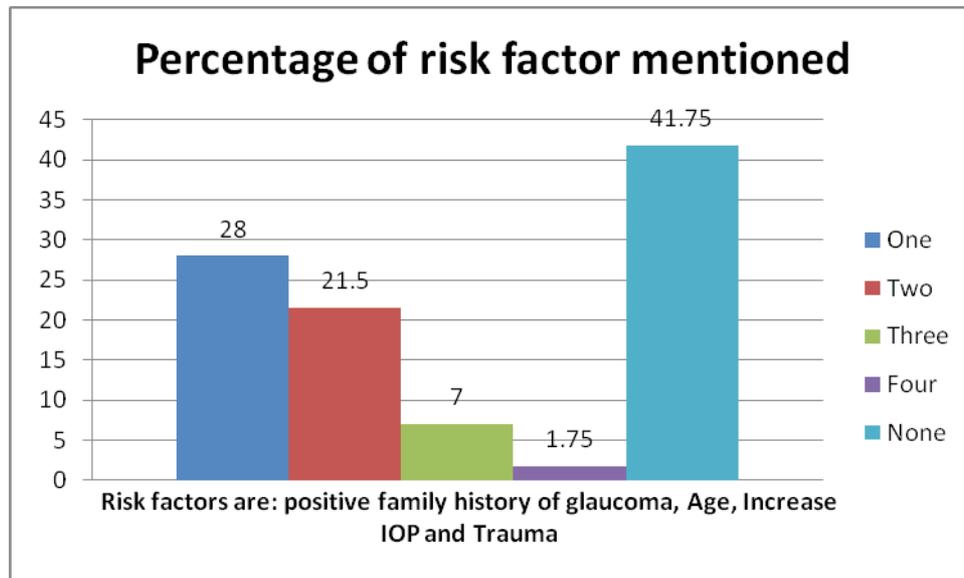
In terms of the information provided on previous page 13.0% (n=52) respondents mentioned one sign and symptom (big eyes); 12.5% (n=50) mentioned two signs and symptoms (big eyes and diminished visual acuity); 4.25% (n=17) mentioned three

sign and symptoms (big eyes, increased intra ocular pressure and loss of peripheral vision); and 0.8%(n=3) mentioned all the signs and symptoms signs, namely increased intra ocular pressure, loss of peripheral vision, diminished visual acuity. More than two thirds of the respondents, namely 69.5% (n=278) did not identify any signs and symptoms of glaucoma. Most signs identified by the respondents in this study were: increase intraocular pressure 8.7% (n=35) and loss of peripheral vision 14% (n=56). This was mostly mentioned by those on glaucoma treatment after they had been informed about their conditions by ophthalmologist and OMAs at the eye clinic of Intermediate Hospital Oshakati.

Surprisingly 18.3% (n=73) respondents mentioned big eyes as the most important sign of glaucoma. Big eyes were included in the interview guide tool but are not one of the sign of glaucoma. The majority of respondents mentioned big eyes as sign of glaucoma because it is a common belief in this study area that people with big eyes are prone to poor vision in general and also blindness. Therefore, proper education on glaucoma needs to be done immediately in order to remove these myths from the Oshana Region communities. The other reason is that people who are blind from glaucoma have wide open eyes as they are trying to search for lights. Based on these findings it is obvious that intensive effective glaucoma communication is urgently needed to increase glaucoma awareness and consequently prevent glaucoma visual impairments.

8. **How many of the following do you know to be risk factors for glaucoma?**

Figure 11: Graph showing percentage of risk factors identified by respondents.



There were 167 (41.75%) of respondents who did not identify any single risk factors for glaucoma; only 1.75% (n=7) correctly identified all four main risk factors for glaucoma, namely, positive family history of glaucoma, age, increase intraocular pressure and trauma.

Twenty eight percent (n=112) correctly identified age as one of the risk factors for glaucoma as they did have some experience of people they have seen having glaucoma.

Twenty one point five percent of subjects (n=86) correctly identified positive family history as a risk factor for glaucoma as they have seen family members who suffered from glaucoma.

Seven percent of subjects (n=28) correctly identified trauma as a risk factor for developing glaucoma but 2.7% of the 7% were just guessing that they think that once

a person picks up injuries then he/she will develop eye problem which might include glaucoma but 95% were not confident of their choice/option.

Only one and half percent of participants (n=6) considered IOP as a risk factor. This percentage is very low and is an indication that the level of glaucoma awareness is very low in this community. More than four fifths (82.5 %) of the respondents had poor knowledge of the risk factors for glaucoma, 12.5% had fair knowledge and only 0.8% had good knowledge. Ophthalmic care personnel should redouble their efforts in fighting glaucoma visual impairments and should provide adequate information regarding glaucoma.

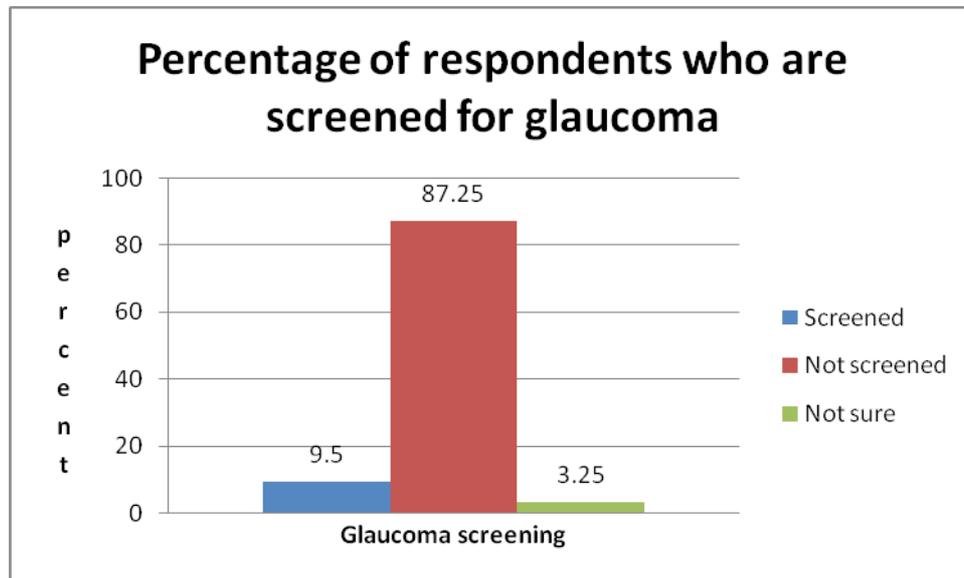
Several studies list intraocular pressure (IOP) as a risk factor (Chandrasekaran, Cumming, Rochtchina & Mitchell, 2006; Bron, Chaine, Villain, Colin, Nordmann & Rouland, 2008). Elevated IOP is an important risk factor and is considered to be a causative factor in glaucoma (Bahrami, 2006). Elevated eye pressure is a major risk factor for most forms of glaucoma because it can cause damage to the optic nerve. However, as many as 25 to 30 % of individuals who develop glaucoma do so with normal, or near-normal, intraocular pressure; their glaucoma is indistinguishable from that of people who have elevated pressure. Of all individuals who have an elevated eye pressure, only about 10.0 % will develop glaucoma. Your eye pressure can be normal, and you can develop glaucoma, or your pressure could be elevated, and you may not develop glaucoma. So pressure is a terrible way to screen whether you have glaucoma (Allingham, 2007).

Studies report that there is a strong association between positive family history of glaucoma as risk factors and POAG (Wiggs, 2007; Kwon, Fingert, Kuehn & Alward, 2009). In this study 21.1% (n=86) of the respondents readily said that positive family history is a risk factor for glaucoma because they have seen siblings of their respective mothers who are blind from glaucoma. Some also reported that they have seen more than three people from the same house at different occasions blind from glaucoma.

In comparison, there were a higher number of respondents who identified all four risk factors for glaucoma compared to those who identified all four signs and symptoms of glaucoma. Most of the latter respondents are on glaucoma treatment. In order for one to know the signs and symptoms of glaucoma one needs to be educated and well informed about the disease and its concomitant signs and symptoms whereas one could be made aware of risk factors when people discuss them.

9. **Have you ever screened for glaucoma?**

Figure 12: Graph showing percentage of respondents that were screened/not screened for glaucoma



Only 9.5% (n=38) were screened for glaucoma and among those that were screened eight of them were glaucomatous patients on treatment. Their condition was detected by chance because they went to the eye clinic complaining of poor vision and had not gone for annual check-ups. An overwhelming majority (n=349), namely 87.25% of the respondents had never been screened for glaucoma. There were 3.25% (n=13) respondents who were not sure whether they had been screened for glaucoma.

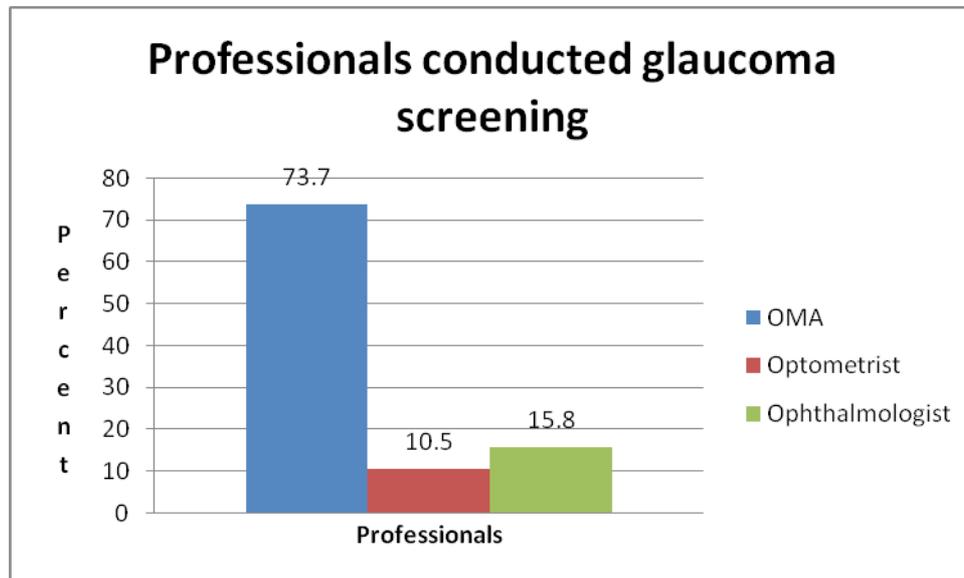
Among people with glaucoma in the developed world the reports from prevalence surveys suggest that only about half are likely to have been diagnosed. In developing countries the number is probably nearer to 1 in 10 or even less in the remotest and poorest-served parts of the world (Rotchford, 2005). However, low detection rates cannot be entirely attributed to lack of awareness of symptoms because in the developing world a significant of undiagnosed cases are already severely affected. There are not enough resources to screen many people for glaucoma even if we could

increase glaucoma awareness and prompt people to demand glaucoma screening services. Palimkar, Khanderkar and Venkataraman (2008) found out that 25 glaucoma cases were detected for the first time during their survey. This is an indication that people are not aware of the importance of annual eye check ups; unnecessary blindness will continue to affect the majority of people if a screening programme is not established in countries soon.

It is disturbing that nearly all the respondents who are aware of risk factors for glaucoma had not even undergone screening. Having awareness about risk factors of a disease is not sufficient to lead someone to put the knowledge into appropriate practice. There might be other barriers which hinder people from seeking screening for glaucoma and this needs to be assessed in future studies.

10. **Who screened you? optometrist, ophthalmologist or (OMA)**

Figure 13: Graph showing respondents screened for glaucoma by an ophthalmologist, optometrist, and OMA.



Thirty-eight respondents $n=38$ (9.5%) had been screened for glaucoma; the majority ($n=28$), namely 73.7% had been screened by OMAs; 15.8% ($n=6$) had been screened by an ophthalmologist and 10.5% ($n=4$) were screened by an optometrist.

The result shows that the majority of respondents were screened by Ophthalmic Medical assistant at eye clinic of Intermediate Hospital Oshakati. According to researcher own observations, majority of respondents were screened by OMAs due to the fact that there are three OMAs working at the eye clinic compare to only one ophthalmologist at the clinic. The ophthalmologist might be more concentrated on surgery then screening patients for glaucoma.

All respondents (10.5%) were screened by private optometrist when they went for refraction and none of the respondent was screened by state optometrist. The researcher assume that state optometrist might only doing refraction and not screening for glaucoma suspects. Therefore it is important for private optometrist

and state optometrist to redouble their effort in glaucoma screening for early glaucoma detection and enhance glaucoma awareness.

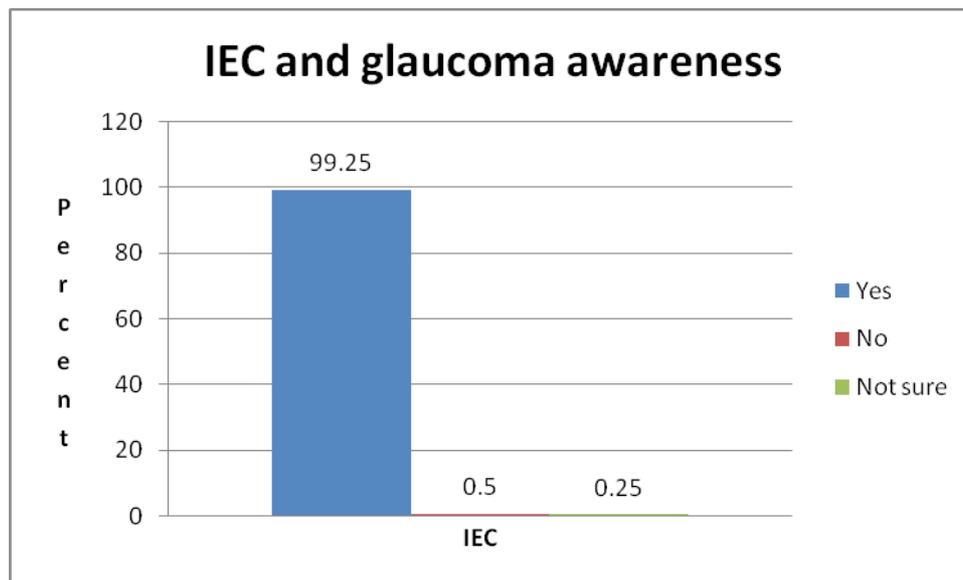
Those respondents who were screened were 3.9 (26.4%) times more aware of glaucoma risk factors compared to those who were not screened (6.8%). One assumes that they might obtain information from their eye care providers during consultation. Glaucoma screening increases the chance of a person being aware of the disease as is evident in the results of this study. So it is recommended that local and visiting ophthalmologists and optometrists should start screening every person who is in a higher risk group of developing glaucoma in the Oshana Region.

Surprisingly, of those who are diagnosed with POAG and attend monthly eye clinic for treatment only 25.0% of them had good knowledge of glaucoma risk factors, 25.0% had poor knowledge and 50.0% had fair knowledge. This could be due to the fact that insufficient information is being given to them. This may be associated with limited time dedicated to the discussion of the disease during the consultation and may also be that the way the information is being given does not enable the patient to understand it. The researcher recommends that more OMAs/ophthalmologist directed patient education is necessary to increase glaucoma awareness in the clinic setting.

SECTION C: SPECIFIC AWARENESS RAISING STRATEGIES

1. Are Information, Education and Communication materials useful in increasing awareness about glaucoma?

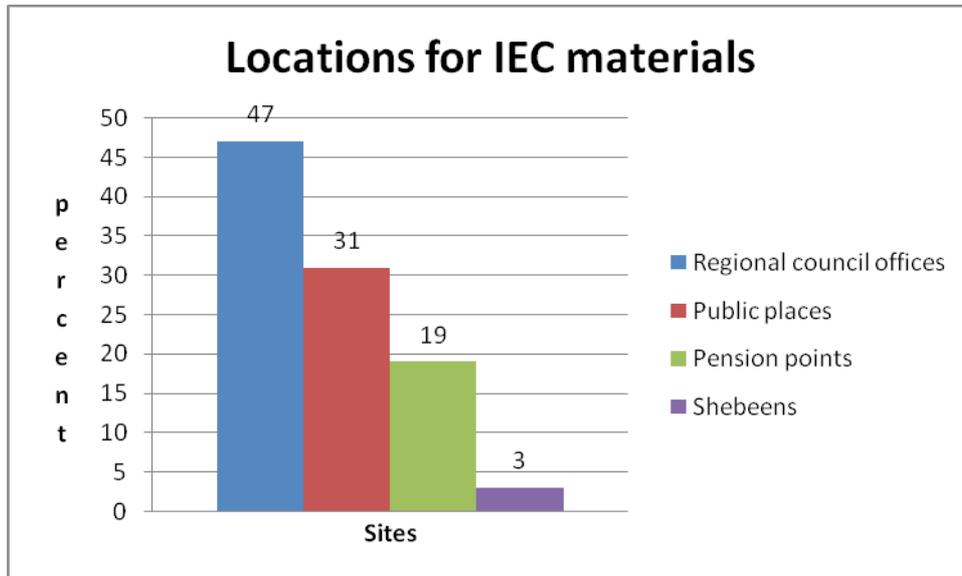
Figure 14: Chart showing percentage of participants that believe that IEC is useful in increasing awareness of glaucoma.



Almost all of the respondents (n= 397), namely 99.25% said that they believe that IEC would be useful in increasing knowledge of glaucoma. This is in concert with a study done by Cherie et al. (2005) and a study by Berbane (2005), who found out that IEC materials were perceived to be useful in increasing knowledge about HIV/AIDS by 51%. IEC on HIV was able to acquaint students about the disease rather than equipping them with knowledge and skills needed in their daily lives. Therefore, appropriate and mutually reinforcing IEC messages with emphasis on life skills are recommended. The researcher concurs with the above statement. If IEC materials on glaucoma are utilised in Oshana region communities, and then increased glaucoma awareness in Oshana region will be achieved

2. Where poster and brochures on eye health care should be placed?

Figure15: Graph showing locations for IEC



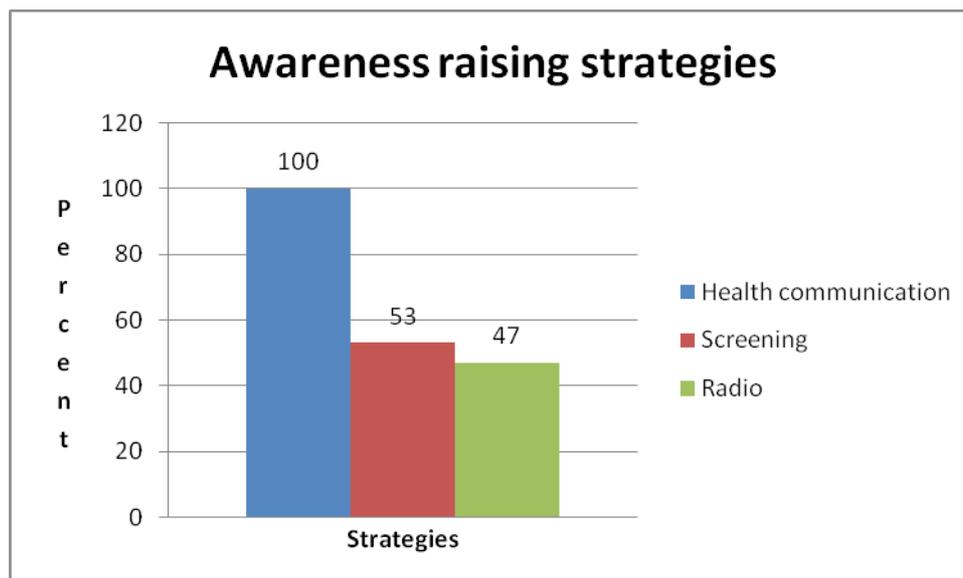
All respondents in this study supported use of IEC material, for example brochures and posters on eye care, in the locations cited on the interview guide tool, namely: community meeting points, churches, health facilities, and schools. The respondents considered these locations as being important and reliable places to put IEC materials. Other places mentioned (suggested) by respondents were shebeens, Regional councillor officers, public places, pension pay point. Regional council offices were ranked first 47.0% (n=188) as almost half of the respondents mentioned them as possible IEC material locations because counsellors are closer to the people; a second 31.0% (n=124) of respondents suggested public places as being the best places to place IEC material; 19.0% (n=76) mentioned pension points because most elderly people get their money and if they placed at pension points, then those who

can see and read can get the message. Only 3.0% (n=12) respondents mentioned shebeens. However some respondents were reluctant to support the idea because people might get drunk and destroy posters

Some participants suggested that nurses who work in clinics should be equipped with glaucoma knowledge. The rationale being that eye clinics are often not accessed by many people particularly in rural areas because of health care costs, long distances to travel to access these clinics, and an inadequate and unaffordable transport system.

3. Which specific awareness raising strategies would be necessary to enhance glaucoma awareness?

Figure 16: Graph showing specific raising awareness strategies to increase glaucoma awareness.



All of the respondents 100.0% (n=400) identified effective health communication as the best strategy to raise glaucoma awareness, 53.0% (n=212) selected population

screening, while only 47.0% (n= 188) of respondents supported the idea of radio health talks. All respondents supported effective health communication as the best strategy to raise glaucoma awareness in Oshana Region. Health communication plays a vital role in public health campaigns designed to prevent infectious and preventable disease in the developing world. Peer educators or glaucoma ambassadors need to be identified in the community so that they can be trained on how to sensitise people on glaucoma in order to spread the message. These ambassadors can be people who are already living with glaucoma or who have family members with glaucoma blindness. This would be extremely effective because people will respect and trust them. Using peer educators or ambassadors is a good strategy because it was one of several used by officials who managed to reduce the HIV/AIDS prevalence rate in the Namibia to 17.8% as a result of a special disease program for combating HIV an AIDS.

Other communication tactics could involve well known personalities, such as Miss Namibia and popular artists singing the campaign songs, for example Gazza and the Dog, to disseminate the glaucoma awareness message. The celebrities could be provided with information on glaucoma in order to incorporate this into musical or song compositions, for example.

Educating patients with glaucoma directly by a physician in Oshakati may not be feasible due to the shortage of ophthalmologists and also some of them cannot speak the local language. In general, ophthalmologists do not have enough time to give a detailed explanation to each and every patient coming to their offices. An

educational plan needs to be developed to increase a patient's knowledge about glaucoma. Health education can be done by an ophthalmic nurse or OMA at the eye clinic and at the hospital ward level. This has to be given to individuals patients who are at risk of glaucoma and who should be screened. However since OMAs have been trained to provide eye health care they would be better equipped to give health education in the community since a primary health care nurse may not have relevant knowledge. This would not rule out the role of primary health care nurses as health education providers but it does emphasize the importance of acquisition of correct and complete information and knowledge on glaucoma.

Fifty-three percent (53.0%) of respondents supported the idea of mass population screening as a way of creating glaucoma awareness. This could be done by early approaches to prevention by screening in order to identify those at high risk of the disease. This would require an understanding of how risk factors were distributed in the region and how they related to the disease. Risk factors can be identified by a person's age, race, and family history or can be clinically observed by examination, such as elevated intraocular pressure and optic nerve head appearance.

Population screening is the best method for early detection and sensitization of the community but is very expensive considering the limited number of resources available.

At each big shopping mall in the Oshana Region there are optometry clinics. The researcher therefore suggests that optometrists should plough back into the

community by allocating one day in a month to provide free glaucoma screening to the community in order to support the government's effort in elimination of avoidable blindness by the year 2020.

The importance of implementing radio health education in Oshiwambo was suggested by .41.0% of the respondents. This is in accord with a study done by Rumisha (2008) on community knowledge and information gaps on HIV/AIDS in the Iringa Municipality, Tanzania, as it was found that the mass media, such as radio and newspapers, are among the most common and popular sources of health education. Although such mass media are popular they are not readily accessible for many people in remote rural areas. A survey carried out in Tanzania found a marked difference in urban/rural ownership of radios, namely 62.5% in urban areas and 29.8% in rural areas. Television (TV) set ownership was markedly lower than radio ownership; 3.4% of the urban population owned TVs and ownership was 0.1% in rural areas. It is true that radio/television programs are more effective in communication of new information. The major advantages of mass media being consistency of the messages and the potentially high frequency of exposure. Radio material does not reach all target audiences because of the community affordability and proprietors conflicting interest in the use of broadcast time schedules (Lwoga & Matovelo, 2005).

In the Oshana Region, radio health talks need to be broadcast twice a week in the afternoons since this is the best time as most people would have finished their household chores. The programme should be rebroadcast every Sunday afternoon so

that people who missed the weekday programmes would have a chance to listen to health talk's programme. In order for radio health talks to be effective it is suggested that call-in programs should be presented so that callers can then ask questions on-air. Although radio health talk was not favoured by all respondents, it is the best channel of education in the Oshana Region because the majority of people have access to Oshiwambo radio. MOHSS (2008) reported that in the Oshana Region 87.9% of women listen to the radio at least once a week whilst only 59.3% of men do so. This is a true reflection of life in the community since many men spend most of their free time at bars listening to music while women are at home listening to the radio.

Table 2: Knowledge of glaucoma per risk factor (N=400)

Characteristic	Good knowledge		Fair knowledge		Poor knowledge	
	Number	%	Number	%	Number	%

Males	12	7.5	31	19.4	117	73.1
Females	23	9.6	55	22.9	162	67.5
40-44 years	7	12.5	10	17.9	39	69.6
45-49	5	9.6	10	19.2	37	71.1
50-54	6	11.2	11	20.4	37	68.5
55 and above	16	6.7	55	23.2	166	70
Employed	13	14.6	10	11.2	66	74.4
Unemployed	18	7	62	23.9	179	69.1
Retired	4	7.6	14	26.9	34	65.4
Complete an undergraduate degree	7	38.9	2	11.3	9	50
Completed secondary School	1	1.6	6	9.8	54	88.6
Completed primary school	4	5	10	11.4	74	84.1
Didn't complete primary School	17	9.6	13	7.3	148	83.1
Never attended formal School	4	7.3	5	9.1	46	83.6
Family history of glaucoma:						
Yes	12	12.8	26	27.7	56	59.6
No	16	6.1	54	20.8	189	73
Not sure	7	14.9	6	12.8	34	72.3

The data depicted in Table 2 provides a platform to contextualise this study in terms of other published findings. There was no significant association between glaucoma knowledge and age found in previous reports (Sathymangalam et al.,2009; Nwosu, 2010) while similar studies found that there was a relationship between old age and awareness of glaucoma (Vijaya, George, Arvind, Raju, Ramesh, Kumaramanickavel & McCarthy; 2008). In this study there was an opposite trend but the difference is not statistically significant. Subjects in the age group 40 to 44 years were 1.9 more

likely to be aware about glaucoma when compared to the respondents who were 55 years old and above.

Some studies from less developed countries found a relationship between gender and lack of glaucoma knowledge (Krishnaiah, Kovai, Srinivas; Shamanna, Rao & Thomas, 2005; Sathymangalam, et al 2009) but other studies did not find a significant association between glaucoma knowledge and gender (Mansouri, Orgul, Gibbons & Mermoud, 2006; Vijaya et al., 2008; Nwosu, 2010). In this study it was found that there is an association between glaucoma awareness and gender as the female respondents had good knowledge (6.7%) compared to the male respondents (2.5%). This might be due to the fact that women stay closer to people who suffer from glaucoma and most of the time it is a daughter or mother who escorts relatives to hospital. This is in concert with the study done by Mboera, Rumisha, Senkoro, Mayala, Shayo and Kinsinza (2007) who found that women had better opportunities to attend health education sessions held at the maternal and child health clinics compared to men. It was pointed out that only a few men would always attend health education sessions through public meetings. However, an article published by Lewallen and Courtrigh in the *Community Eye Health Journal*, (2006) suggests the opposite as the article states that women are less likely to be educated than men. They are therefore less likely to be aware that some blindness can be cured, to know where to go, and to know how to get there. Elderly women, with little or no formal education or exposure to hospital settings, may have more concerns and questions than men regarding surgery. Language barriers or unfamiliarity with the health system can lead to decreased awareness of health care services by some women.

Several studies reported that there was an association between glaucoma awareness and higher level of education (Krishnaiah et al., 2005; Silva et al., 2005; Mansouri et al., 2006; Hoevenars et al., 2005 & Nwosu, 2010).

In this study respondents who had undergraduate degrees were 5.3 times (38.9 %) more aware of glaucoma than people with no formal education; respondents who completed secondary school had poor knowledge (88.6%). This higher level of glaucoma awareness among subjects with undergraduate degree could be due to their level of education and their exposure to the disease. It is however, disturbing to note that respondents who completed secondary school had poor knowledge on glaucoma risk factors (88.6%) in relation to those who had not completed primary school (83.1%). This finding is confusing and a comprehensive study needs to be done to determine the cause of poor knowledge among people who completed secondary education.

The majority of respondents had at least primary education and this did not contribute to the level of glaucoma awareness. The level of awareness though low, is fair, bearing in mind that the only eye clinic (which is curative based) in the region was established before Independence and there is a shortage of eye care personnel. However, the low level of awareness could also be related to the Vision 2020 program of the national blindness program which has been in the pipeline for the last past seven years without being finalised and implemented.

In this study subjects with a positive family history of glaucoma are 2 times more likely to have an awareness of glaucoma risk factors compared to those subjects who do not have relatives with glaucoma. Surprisingly, those subjects who are not sure whether they have family members with glaucoma are 1.2 times (14.9%) more aware of glaucoma risk factors than those with family history. They might have obtained knowledge from friends or neighbours. It makes intuitive sense that those who have family members with glaucoma will have at least heard of the disease because family members bring patients in for their eye appointment and gather information from their eye care providers.

The findings suggest that particular attention should be paid to those who do not have a family history of glaucoma as those who are more at risk are more likely to know about glaucoma. The assumption then is that they would be more likely to get screened and their disease would be treated earlier. However, this is an assumption as it is now well known that there are barriers that prevent people accessing screening and other care.

Glaucoma is an irreversible asymptomatic condition until the advanced stage. Early detection and treatment play pivotal roles in the control of blindness due to glaucoma. Effectively educating the public about the disease is necessary to increase public awareness. Who should be targeted for education since the resources in Namibia are limited?

The results suggest that an effective strategy might involve targeting not only groups of people who are at risk of developing glaucoma (people over the age of 40, people with elevated IOP, people with trauma and people with positive family history of glaucoma) but also those who are more likely to lack knowledge of glaucoma.

Awareness does not mean that the respondents know everything about the disease; it just means that a respondent has heard about the condition. Understanding the causes or treatment of a disease is knowledge (Saikumar, Giridhar, Mahesh, Elias & Baht, 2007).

Previous studies have shown that even though most people claim to be aware of the condition, only less than one percent could describe its symptoms or pathophysiology correctly (Omolase, 2008).

4.6. CONCLUSION

This chapter discussed the data analysis and key findings of the research undertaken on Socio-demographic data and glaucoma knowledge. The results reveal that the level of awareness of glaucoma is poor. More patient education programmes could improve the situation.

CHAPTER 5

LIMITATIONS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter provides limitations, conclusions and recommendations based on the findings of the study. The purpose of this study was to explore and describe the awareness of glaucoma that clients have at the OPD (out patient department) of Intermediate Hospital Oshakati. The researcher could then use the findings to identify specific preventative strategies to enhance glaucoma awareness.

The objectives were:

1. To explore and describe the awareness of clients regarding glaucoma attending the OPD of IHO.
2. To identify specific awareness raising strategies on glaucoma as a means to prevent glaucoma visual impairments.

5.2 LIMITATIONS OF THE STUDY

The main limitation of this study was the cultural definition of glaucoma and educational level of respondents. The results could therefore only be applied to similar communities and further research should be undertaken to assess the impact in different communities. The structured interview was not designed to examine depth or accuracy of knowledge about glaucoma. For example, respondents who indicated that they were familiar with glaucoma and its risk factors may still be inadequately informed about glaucoma and assume that they do not need to be screened if they do not have any of the mentioned risk factors. It was very difficult to obtain primary sources (books), because all available ophthalmology books were very old editions

5.3 CONCLUSION

The findings, together with the relevant theoretical information used in the study, have led the researcher to arrive at several conclusions.

The objectives of the study were met;

1. To explore and describe the awareness of clients regarding glaucoma attending the OPD of IHO

Awareness of glaucoma is very low among clients attending the out patient departments in health facilities in northern Namibia. The level of knowledge among those reporting to be aware of glaucoma was also poor therefore it would not be unreasonable to assume that this holds true in the general population in Namibia.

2. To identify specific awareness raising strategies on glaucoma as a means to prevent glaucoma visual impairments’.

Effective health communication was identified as the best awareness raising strategies on glaucoma as means to prevent glaucoma visual impairments (100%) followed by mass population screening (53.0%) and lastly radio health talks (47.%)

The study provides us food for thought regarding the intensification of efforts for combating the morbidity related to glaucoma. Targeted screening, breaking down barriers to access, campaigns to create awareness among the people regarding importance of regular eye examinations, may all be effective in reducing the number of patients going blind from glaucoma. Using available data from health surveys, improving community awareness, regular eye checks permitting earlier case detection, and early treatment of glaucoma, are the fields which need attention to avoid what should be a preventable visual disability. Government should provide eye care centres with proper diagnostic tools for early detection of glaucoma. Efforts need to be made to train general physicians and PHC nurses in the recognition of this disease. In short, a combined effort by governments, non-government organisations (NGOs), ophthalmologists, and PHC providers, should help to prevent the world from glaucoma related blindness.

IEC materials were perceived to be useful in increasing awareness about glaucoma by almost every participant in this study. Churches, schools, community meeting points, health facilities and regional council offices were highly preferred places to put IEC materials. An effective IEC requires partnerships between health providers,

religious and community leaders, parents, and the media. A specific glaucoma raising strategies and efficient information, education and communication (IEC) strategy needs to be designed to increase awareness of the community about glaucoma so that early diagnosis and treatment of individuals with this condition may be possible, thereby preventing needless visual impairment and preserving quality of lives.

5.4 RECOMMENDATIONS

It must first be pointed out that the recommendations that follow are put forward in the hope that policy makers and all those involved in hospital management and eye patient care management will find them useful in their decision making. It must however be borne in mind that while this study provides suggestions and recommendations towards increasing glaucoma awareness in the northern part of Namibia, it does not serve as a detailed ophthalmic examination plan or ophthalmic out reach plan to effect the required increase in glaucoma awareness to improve the quality of patients lives.

First, there is a need to adequately inform and educate patients about their health most especially eye health. A well informed patient is likely to present early and comply with treatment. In order to improve effectiveness of the implementation of health education communication strategies, monitoring and evaluation of the performance of the programme is important to ensure that it is accomplishing its goal. This health information should be provided by OMAs to all patients attending health facilities.

Secondly, community outreach programmes should be carried out periodically in order to screen people in the community and to offer qualitative treatment. Community outreach programmes should be carried out once a month at community outreach point by Ophthalmic Medical Assistance and Ophthalmic Nurses. Outreach programme should be incorporated to each and every OMAs's annual plan during financial year 2012/13

Thirdly, since there is not yet a good screening test for POAG, the emphasis should be on detecting people with advanced glaucoma who are at a substantial risk of progressing to blindness and who require urgent treatment. Thus to help achieve this realistic goal then patients who present themselves to ophthalmologists and who are over the age of 40 years or people with family history of glaucoma should undergo tonometry and optic-disc assessment as part of their examination. Failure, at present to perform these simple procedures routinely, means that cases of well-established glaucoma are missed.

More specific recommendations are:

1. Research and information: There is a need to carry out a survey through rapid assessment to determine the extent of lack of glaucoma awareness at a large scale and strategies should be evolved to increase glaucoma awareness. Actors are OMAs and fourth UNAM medical students.

2. Division of IEC should continue the development and dissemination materials, focusing on the importance of understanding glaucoma and blindness prevention.
3. Radio talk shows: OMAs should develop a radio program to raise glaucoma awareness in community members on a weekly basis. This should be a call-in program to allow listeners instant access to answers to their questions and concerns. This information should include signs and symptoms of glaucoma, prevention and the need for annual check-ups. Radio talk shows should be a continuous activity and should be implemented during financial year 2012/13
4. Population screening: Although it is very expensive to conduct mass population glaucoma screening, eye care personnel should develop methods on how they could assist screening of people who are in a risk group of developing glaucoma.
5. Training and support: Primary health care (PHC) nurses should have appropriate training and receive information on the best way to encourage communities they serve to seek glaucoma screening services. Community eye health should be introduced in nursing curriculum. This should be done by Dean of faculty of public health and Nursing and National blindness prevention programme manager. General practitioners/ medical officers should be taught how to do tonometry and optic disc assessment using direct ophthalmoscope so

that they can accurately detect higher degrees of disc cupping by ophthalmologist and OMAs.

6. Glaucoma awareness week: The national blindness prevention programme should create glaucoma awareness week in Namibia. Glaucoma awareness week should aims at educating people on the importance of annual eye check-ups and on how to asses their risks for glaucoma, such as age, positive family history, trauma and to be aware of the importance of regular eye examinations and disease detection. Blindness prevention programme manager should incorporate glaucoma awareness week into his annual plan during the financial year 2012/13

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APPENDICES**APPENDIX 1: DATA COLLECTION TOOL****SECTION A: BIOGRAPHIC DATA**

1. AGE

40-44	
45-49	
50-54	
55 and above	

2. GENDER

MALE	
FEMALE	

3. EMPLOYMENT STATUS

EMPLOYED	
UNEMPLOYED	
RETIRED	

4. EDUCATIONAL BACKGROUND

TERTIARY	
SECONDARY	
PRIMARY	
NONE	

SECTION B: KNOWLEDGE

1. Have you ever heard of glaucoma?

Yes

No

2. Have you ever seen people with glaucoma?

Yes

No

3. How would you describe it?

4. Do you have family members with glaucoma?

YES,

NO,

NOT SURE

5. Can people go blind from glaucoma?

YES,

NO,

NOT SURE

6. Can one have glaucoma without having the symptoms

Yes

No

Not sure

7. How many of the following do you know to be the signs and symptoms of glaucoma?

(a) Big eyes

(b) Increased intra ocular pressure

(c) Loss of peripheral vision

(d) Diminished visual acuity

8. How many of the following do you know to be risk factors for glaucoma?

- (a) Age over 40
- (b) Family history of glaucoma
- (c) High eye pressure
- (d) Trauma
- (e) I'm not sure

9. Have you ever been screened for glaucoma?

YES,

NO

10. Who screened you?

Optometrist

Ophthalmologist

OMA

SECTION C: SPECIFIC AWARENESS RAISING STRATEGIES

1. Is Information, Education and Communication materials useful in increasing awareness about glaucoma?

YES,

NO,

NOT SURE

2. Where posters and brochures on eye health care should be placed?

- (a) Community meeting point
- (b) Church

- (c) Health facilities
- (d) School
- (e) Others (Please specify)

3. Which awareness rising strategies would be necessary to enhances glaucoma awareness?

- (a) Radio talk
- (b) Effective health communication
- (c) Population screening

**APPENDIX 2: LETTER OF PERMISSION: POST GRADUATE STUDENTS
FROM UNAM**

**APPENDIX 3: APPROVAL LETTER FROM MINISTRY OF HEALTH AND
SOCIAAL SERVICES**

**APPENDIX 4: PERMISSION TO CONDUCT RESEARCH FROM
INTERMEDIATE HOSPITAL OSHAKATI**

