

EXPLORING THE KNOWLEDGE, PERCEPTIONS AND PRACTICES OF PRIMARY LEVEL HEALTH WORKERS IN THE TALENSI DISTRICT OF THE UPPER EAST REGION OF GHANA REGARDING GLAUCOMA

Freeman Samson Samani
Ghana

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Health Education/
Vrije Universiteit Amsterdam

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A thesis submitted in partial fulfilment of the requirement for the degree of Master of Public Health

By

Freeman Samson Samani
Ghana

Declaration:

Where other people's work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with departmental requirements.

The thesis (Exploring the knowledge, perceptions and practices of primary level health workers in the Talensi District of the Upper East Region (UER) of Ghana regarding glaucoma) is my own work.



Signature:

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LIST OF ABBREVIATIONS

AR	Ashanti Region, Ghana
CBM	Christian Blind Mission
CCT	Central Cornea Thickness
CHN	Community Health Nurse
CN	Clinical Nurse
CRS	Catholic Relief Services
DHD	District Health Directorate
DHMT	District Health Management Team
DSD	Datuku Sub-District
FGD	Focused Group Discussion
GAR	Greater Accra Region
GHS	Ghana health service
GOG	Government of Ghana
GKS	Gate keeper System
HEFRA	Health Facility Regulatory Authority
HIMS	Health Information Management System
HIO	Health Information Officer
HPO	Health Promotion Officer
HReH	Human Resource for eye Health
ICO	International Council of Ophthalmology
IDI	In-Depth Interview
IOP	Intra Ocular Pressure
IST	In-Service Training
KATH	Komfo Anokye Teaching Hospital
KIT	Royal Tropical Institute (Koninklijk Tropisch Instituut)
MOH	Ministry of Health
NECU	National Eye Care Unit
NHIS	National Health Insurance Scheme
NHRC	Navrongo Health Research Centre

NP	Nurse Prescriber
ON	Ophthalmic Nurse
OPD	Out Patient Department
PI	Principal Investigator
PA	Physician Assistant
PLHW	Primary Level Health Worker
POAG	Primary Open Angle Glaucoma
PPME	Policy planning Monitoring and Evaluation
PREC	Presby Regional Eye Centre
RA	Research Assistant
RDHS	Regional Director of Health Service
RGN	Registered General Nurse
RHMT	Regional Health Management Team
TAGS	Tool for the Assessment of Glaucoma Services.
TH	Traditional Healer
TD	Talensi District
TDH	Talensi District Hospital
UER	Upper East Region
VU	Vrije Universiteit Amsterdam (Free University of Amsterdam)
WGA	World Glaucoma Association
WISN	Workload Indicator for Service Needs

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DEDICATION

MY wife and daughter, Mabel and Mehetabel.

My parents Donald and Lucy.

Dr. Koku Awoonor Williams, Director PPME, GHS.

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GLOSSARY

Blindness	visual acuity of less than 3/60 in the better eye or a visual field of less than 10 degrees
Fundoscopy,	also known as Ophthalmoscopy, is a test that allows a health professional to see the inner aspect of the back of the eyeball.
Ophthalmoscope	instrument for doing a funduscopy
Tonometer	instrument for measuring the Intra ocular pressure (pressure in the eye ball)
Tonometry	process of measuring the pressure in an eye ball
Visual Acuity Test	An examination done to determine the smallest (lowest) letters that can be read from a standardized chart usually held 6 meters (20metres) away from the patient.

ABSTRACT

Background of Study: Blindness caused by glaucoma is irreversible and patients usually with advance disease when little can be done for them. Primary level health workers in Ghana are key in glaucoma control in Ghana.

Aim: The study aims to identify common eye conditions reported in Ghana and identify factors influencing early detection and management of glaucoma in the Talensi District of Ghana.

Methods: A literature review, desk study and a qualitative study were done to review global and national evidences regarding glaucoma, and assess Knowledge, perceptions and practices of primary level health workers in the Talensi District regarding glaucoma.

Findings: The prevalence of glaucoma in Ghana is between 6.8% and 8.4%. The government of Ghana employs over 70% frontline eyecare providers. Glaucoma care is not universally covered under Ghana's NHIS. The ophthalmic nurse in the Talensi District was well informed and practiced fairly well regarding glaucoma. Knowledge, perceptions and practices of Clinical Nurses and Community health nurses in the Talensi District regarding glaucoma were inadequate. There was no national treatment guideline for specialized eye care providers in the Talensi District.

Conclusion: There is a global consensus that early detection is important in glaucoma control, however an inadequate knowledge and practices of primary level health workers, and an inadequate integration of eye care services among other factors in the Talensi District is hindering this.

Recommendation: Guidelines should be developed to aid in identification, education and referral of people at high risk of developing glaucoma at the community level.

Key words: Glaucoma, Primary level, Health workers, Ghana, eye disease.

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Name: Freeman Samson Samani

Nationality: Ghana

INTRODUCTION

As a medical officer, I worked as the head of a district hospital in the Upper East Region of Ghana, the second poorest region in the country. I had my basic education in the Upper East Region of Ghana and my university and medical education in Accra, the capital city of Ghana. After medical school, I initially worked as an intern at a teaching hospital, then a medical officer at a regional hospital and as a medical superintendent of a district hospital. Because of my interest in eye care, I chose to do my International federation of Medical Students' Association medical exchange program in the department of ophthalmology, Charles University, Prague, in November 2008.

I have therefore worked at all the curative levels of health delivery in the country and particularly the primary level where I have been for two years before coming to the Royal Tropical Institute(KIT). This made me see the challenges that were faced at the primary level and the opportunities that were available regarding glaucoma care. Like the general health delivery, there were challenges with logistics and perceptions in the community regarding eye disease. However, peculiar to glaucoma was that, most health workers at the primary level including senior ones had very little knowledge and experiences with glaucoma. Within the two years at the district before leaving for school (KIT), I witnessed three senior retired health workers (one being my father) go blind from glaucoma without knowing they had it. These and other experience made me want to do a study that will lead me to get an in-depth understanding of the knowledge and experiences of primary level health workers regarding glaucoma in the region I had worked in for the longest part of my carrier.

My hope is that, by the end of the thesis I will have an idea of the knowledge, perceptions and practices of a chosen rural district in the UER regarding glaucoma and factors that influence this knowledge, perceptions and practice.

The world has realized that glaucoma, a leading cause of irreversible global blindness is posing serious challenges to the health status of countries. Recognizing this, WHO is in the process of developing an assessment tool to be used by all member countries to strengthen their health delivery for glaucoma care. Ghana should be more involved in this renewed global interest in glaucoma because it has the highest overall prevalence of glaucoma in Africa. There are studies that have looked at the knowledge and awareness of patients regarding glaucoma and assessed facilities available for the management of glaucoma in the country, but none has qualitatively explored the knowledge, perceptions and practices of primary level health workers regarding glaucoma and factors that influence these. This is very important since the primary level is key in linking patients in the communities to points of specialist eye care at the hospital. This study will therefore serve as a point to understanding, designing interventions and conducting research in future in the field of glaucoma at the primary level of healthcare in Ghana.

CHAPTER ONE: BACKGROUND

Ghana, an Anglophone West Africa Country is situated north of the Gulf of Guinea and the Atlantic Ocean. It is bordered to the west, north and east by Ivory Coast, Burkina Faso and Togo respectively. Ghana has a total land area of 238 540 (km²)¹ with ten administrative regions and 216 districts. Ghana has a warm, humid climate with a mean rainfall estimated at 1187 mm per year and a mean temperature range of between 26.1 °C at the coast and 28.9 °C at the extreme north (figure 1.1 in annex 1)².

Ghana's population was projected at 28,033,000 in 2016¹. The population is growing at 2.4% with 54% of the total population situated in urban areas which is growing at 3.4%. It has a life expectancy at birth of 62years for females and 60 years for males. The literacy rate for people 11 years and above is 63% with the three northern regions scoring the lowest scores of less than 43%².

With a gross domestic product per capita estimated at 1387.9us\$ in 2014, Ghana is classified as a Lower Middle-Income Country with 80% of its workforce in the informal sector. Majority of the employed are concentrated in three major sectors of the economy namely agriculture, trading and manufacturing³.

Malaria, HIV/AIDS, and lower respiratory infections are the top three causes of number of years of life lost (YLLs) due to premature death and disability-adjusted life years (DALYs) lost. Household air pollution, dietary risks, high blood pressure, childhood underweight and iron deficiency contribute most to the disease burden⁴.

The Talensi District is located in the Upper East Region (UER) of Ghana which is the second most deprived region in the country^{5 6 7}. The UER is said to be worse than Greater Accra and Ashanti regions as far as eye services are concerned but better placed when compared with the Western and Upper West regions⁸.

The Talensi District lies between latitude 10' 15" and 10' 60" north of the equator and longitude 0' 31" and 1' 0.5" west of the Greenwich meridian with a total land area of about 838.4 km² and is divided into eight sub-districts. About 84% of its population live in the rural setting and 90.7% of its labour force are into farming^{7 9}.

People living in the Talensi District capital usually have access to the district hospital and also easily travel to the regional capital for higher levels of care because of the good road network between the district capital and the regional capital. Datuku where sub district analysis will be done is however challenged with very bad road networks linking the district and regional capitals with little traffic on that road, hindering access to health care (Table 1.1)^{7 9}.

83.8% of the patients who attend health facilities in the Talensi District use the NHIS. As at 2010, there were 4,231 persons with disability in the district representing 5.2% with more females (5.5%) being disabled compared to males (4.9%). 42% of the disable are as a result of blindness with more females being affected (Table 1.2 and 1.3)^{7 9}.

1.1 STRUCTURE OF HEALTH DELIVERY SYSTEM IN GHANA.

The Ministry of Health (MOH) is the overall governing body for the health sector in Ghana. The MOH provides governance, resources, and monitors and evaluates all players in the health sector. Some implementing agencies of MOH within the public sector include Ghana health service (GHS), teaching hospitals and quasi government agencies with the Health Facility Regulatory Authority (HEFRA) regulating private practice^{10 11}.

Functionally, the health delivery system in Ghana is organized in levels including; the tertiary level consisting of specialist care, secondary level consisting mainly of general practice and the primary level made up of a district hospital (level C), health centres (level B) and community-based health planning and service (CHPS) compounds (level A)^{10 11}.

Primary level Health workers (PLHWs) include medical doctors at district hospitals, physician assistants (PAs), clinical nurses (CNs) and community health nurses (CHNs).

Human resource for eye health (HReH) in Ghana is organised along the same line as above. Figure 1.2 below summarizes it.

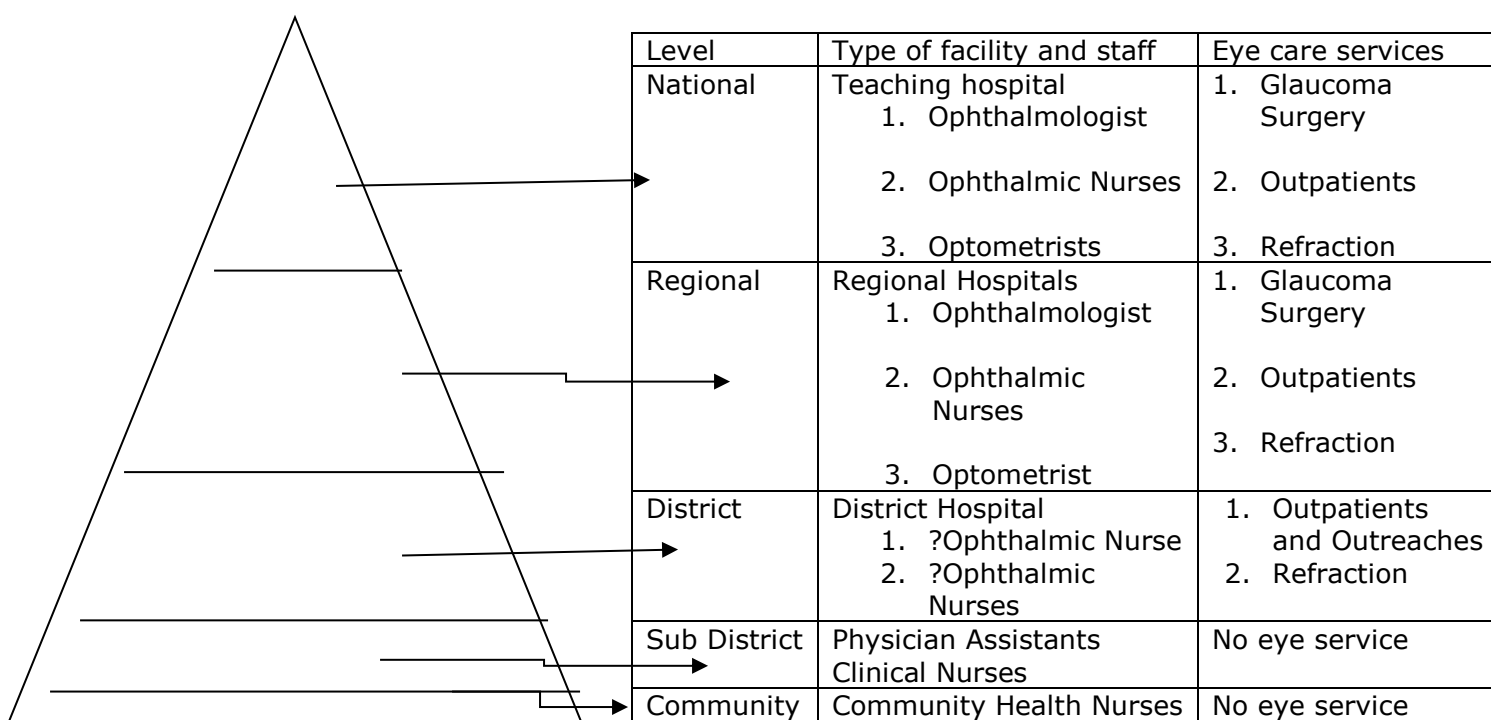


Figure 1.2: Distribution of eye care services and providers at different levels of health delivery in Ghana

GLAUCOMA AND BLINDNESS

Blindness is caused by defects with structures in the path of vision such as the cornea, the lens, the retina, the optic nerve and the part of the brain responsible for sight. A fluid in the eye, the aqueous humor is produced to maintain the shape and function of the eye. This fluid is continuously drained via the trabecular meshwork to maintain the intraocular pressure (IOP) within certain physiological normal limits estimated as 12 -22 mmHg [12 13 14].

Glaucoma is a disease that damages the optic nerve. It is thought to be caused by an increase in the IOP of the eye. This is mostly from a decreased outflow of fluid from poor drainage at the trabecular meshwork or closed drainage angle. This increased IOP causes damage to the optic disc (part of optic nerve visualized on examination of the eye) leading to a damage described as cupping. This causes blind spots in a person's vision. Usually peripheral fields are affected first with central vision well preserved till finally sight is completely lost. This is why glaucoma is mostly without any early symptom only for the patient to be confronted with an advance disease [12 13 14 15 16 17].

Glaucoma is generally thought to be associated with high IOP, however in normal tension glaucoma the IOP is usually below 22mmHg while evidence of optic nerve damage occurs. Glaucoma is referred to as primary glaucoma when it is not due to any underlying medical condition or secondary glaucoma when it is due to an underlying medical condition. It is referred to as closed angle glaucoma when the drainage angle is closed and open angle glaucoma when the drainage angle is open, but the drainage through the trabecular meshwork is decreased. Primary open angle glaucoma (POAG) is the commonest presenting form of glaucoma in Ghana and for this study I will be focusing on it [12 13 18 16 19].

Risk factors for the development of glaucoma include; age greater than 40 years, family history of glaucoma, African or Hispanic heritage, short sightedness, history of onchocerciasis and chronic use of steroid based eye medications [12 13 20 21].

Some basic examinations that can done to aid glaucoma detection are shown in table 1 [20 22 23].

Examination	Instrument
Visual acuity test	Snellen chart
Pupillary light reflex	Pen torch
Tonometry	Tonometer
Fundoscopy	Ophthalmoscope
Visual field exams	Perimetry (or rough assessment by hand movement)

Table 1.4: Instruments for the Assessment of Glaucoma Patients at The Primary Level

Treatment modality for glaucoma is patient specific and guided by the severity of the disease and the patient's response to treatment. The cost of being on lifelong medications, unavailability of drugs and no subjective improvement while on medications adversely affect compliance to treatment. Surgery is particularly recommended for patients in low resource settings who might find it difficult to be compliant with lifelong medications²⁰. This however depends on the availability of resources to operate such patients. It also depends on the skill

of performing ophthalmologist. Newer and less invasive techniques are now available but not accessible to most people in developing countries including Ghana. The aim is to detect the condition early and start appropriate management early so as to delay progression to blindness^{12 20 24} .

CHAPTER TWO: PROBLEM STATEMENT, JUSTIFICATION, OBJECTIVES AND METHODOLOGY

2.1 PROBLEM STATEMENT

Blindness is a very important public health issue that does not only have varied consequences on the patient and his/her family but also have far reaching effects on a nation as a whole. It is estimated globally that the direct cost of blindness is 25 billion dollars annually with this figure likely to double or triple if indirect cost is included²⁵.

Over 39 million people are blind worldwide of which 75% are either avoidable or treatable. Developing countries are responsible for over 80% of the global burden of blindness. POAG is the leading cause of irreversible blindness globally with 8% of the world blindness due to it. It is estimated that over 57 million people are living with POAG globally with 8.4 million being blind^{26 27 28 29}.

Cataract is the leading contributor followed by glaucoma to Africa's blindness prevalence of 1%³⁰. Blindness due to cataract can be cured but glaucoma is an irreversible cause of blindness. The overall prevalence of blindness in Ghana is 0.74% with a majority of the blind in the rural settings (1%), while the prevalence of severe visual loss is 1.07%³¹. In Ghana, the proportion of people blind is found to be closely related to age, with 0.22% of people aged 30-39 years being blind compared to 19.2% of those above 80 years being blind. More females (54.8%) are blind compared to males³¹. Trachoma and Onchocerciasis are now confined mostly to the Northern and Upper West Regions of Ghana. A survey in 2009, showed that while the UER had an active trachoma prevalence of 0.01%, neighbouring Upper West and Northern Regions had an active trachoma prevalence of 4.7% to 16.1%³².

Glaucoma is the second overall leading cause of blindness and the leading overall cause of irreversible blindness in Ghana. The prevalence of glaucoma in Ghana was estimated to be 6.8% in a population based survey that was conducted between 2006 and 2008 in five communities of the country with 2.5% of them being blind¹⁹. In another population based study, 600,000 out of 18.8 million Ghanaians were estimated to be living glaucoma in 2001³³. Ghana was said to have the highest burden of glaucoma in Africa at the first African glaucoma summit that was held in Accra³⁴. POAG contributes about 20% to the burden of blindness in Ghana much higher than its contribution to global blindness.^{31 19}.

A study conducted in the Komfo Anokye Teaching Hospital (KATH) in Ghana showed that only 27% of patients who present to eye clinics of teaching hospitals have knowledge of glaucoma. In this same study, more than 85% of those with no formal education had not heard of glaucoma³⁵. KATH is one of two big teaching hospitals in the country that receives referrals from secondary level facilities and other teaching hospitals³⁶. Patients will usually be told the reason why they are being referred to such a high level of care before being referred. It is thus expected that such patients will have a high awareness of their conditions because of the pre-referral education on their conditions. Also at the teaching hospitals, patients are seen by ophthalmologist and will usually receive some education on their condition during reviews. In contrast, at the regional and worse still at the primary level, where patients are either seen by physician assistants or general practitioners, they are less likely to receive any education on eye conditions such as glaucoma. The patient load at the primary level may also hinder the education of patients on their eye complaints. With the knowledge and awareness seen in the study above among patients presenting to the KATH, it can be assumed that the level of awareness at district, health centre and household/community levels will even be lower.

Key to reducing blindness among glaucoma patients is an appreciable level of awareness and knowledge in the community of this condition. This however very much depends on the knowledge and skills of Primary Level Health Workers (PLHWs) since they are the first point of call and closely interact with communities in which they work.

In order to reduce the burden of blindness caused by glaucoma, the International Council of Ophthalmology (ICO) recommends that "all patients presenting for eye care should be reviewed for glaucoma risk factors and undergo clinical examination to rule out glaucoma. Patients with glaucoma should be told to alert brothers, sisters, parents, sons, and daughters that they have a higher risk of developing disease, and that they also need to be checked regularly for glaucoma. The ability to make an accurate diagnosis of glaucoma, to determine whether it is an open or closed form, and to assess disease severity and stability, are essential to glaucoma care strategies and blindness prevention"²⁰

2.2 JUSTIFICATION

For the above-mentioned reasons, there is a resulting increase in global and local attention to glaucoma³⁷. In line with this, there have been a number of studies done in Ghana focusing on glaucoma. However, most of these studies have looked at the prevalence and risk factors of glaucoma among different populations, patients knowledge and awareness and tertiary students' knowledge among others regarding glaucoma^{19 33 35 38}. In my search, I have not come across any qualitative study that explored in-depth, what the health system at the primary level knows or is doing regarding patients presenting with risk factors for glaucoma in Ghana. It is relevant to also know what PLHWs' knowledge, perceptions and practice are regarding glaucoma, given that they are the first point of call for patients accessing the formal health care especially in rural areas in Ghana. Additionally, in line with the CHPS concept in Ghana, most interventions are decentralized to the community health level which is the lowest of the primary level^{39 40}.

Also, in attempts to enforce its non-functional Gate Keeper System (GKS), Ghana is in the process of linking its social health financing to the GKS such that provision of care and Insurance re-imburement will be based on compliance to the GKS⁴¹. As demonstrated earlier, PLHW will be the gate keepers as they are at the point of entry into the formal health system, and therefore will be deciding who needs to be seen at higher levels of care.

From the above discussion, it is clear that it is of public health importance in Ghana to explore the knowledge, perceptions and practices of PLHWs regarding glaucoma in order to make recommendations towards improved case detection of glaucoma in the health set up and to contribute to reducing the burden of irreversible blindness caused by glaucoma. It is however important to also do a desk study in order to appreciate the systems that are already in place to aid in early detection and management of glaucoma in the study area and in Ghana. Finally, it will be important to also review literature of works done in glaucoma care globally and in the country so as to be able to better contextualise any findings or recommendations that will be made. The reasons for choosing the UER and the Talensi District of Ghana are already discussed earlier.

2.2 OBJECTIVES

MAIN OBJECTIVE

Identify common eye conditions reported in Ghana and the Talensi District, factors influencing early detection and management of glaucoma in the Talensi District and make recommendations towards early detection of glaucoma in order to contribute to reducing the burden of irreversible blindness caused by glaucoma in the Talensi District, Ghana.

SPECIFIC OBJECTIVE

1. To identify global and local evidence regarding the occurrence, detection and management of glaucoma.
2. To identify common eye problems in the Talensi District and factors influencing the early detection and management of glaucoma in the Talensi District, Ghana.
3. To explore the knowledge of different health workers at the primary level regarding glaucoma in the Talensi District, Ghana.
4. To explore perceptions and practices of primary level health workers in the Talensi District towards patients presenting to health facilities with risk factors of glaucoma.
5. Make recommendations aimed at bridging any identified gaps in the knowledge, perceptions and practice of primary level health workers in the Talensi District regarding glaucoma to relevant bodies involved in eye care in Ghana, in order to contribute to early detection and management of glaucoma in the Talensi District, UER and Ghana as a whole.

2.3 METHODOLOGY

The study is in three-fold, a literature review on global and national evidences regarding glaucoma, a qualitative study in the Talensi District and a desk study at the National eye care unit (NECU) of Ghana. Curricula of institutions that train PLHWs will also be reviewed as part of the desk study.

The first objective will be covered by review of published literature and relevant grey literature, objective two will be covered by a desk study while objectives four and five covered by the primary qualitative data collection.

2.3.1 LITERATURE REVIEW

A search of relevant literature was done for global and local data as far as glaucoma prevalence, detection and management including treatment outcomes were concerned. Part of the literature reviewed was used to plan and design the primary study including the design and methods used. It also served as a background to better understand and contextualise findings as well as guide in making recommendation for identified gaps.

Search was mainly computer based with few searches from bookshelves especially for yet to be published literature. An example of such bookshelf search was the use of the latest Ghana Blindness and Visual impairment study 2015 which had a better national coverage than

previous studies and also, a study done in northern Nigeria and published in the BMJ but was not accessible online. Also, data collection guides were retrieved from WHO.

PubMed and google scholar were the primary search engines used for the literature search. For articles with limited accessibility but within the holding of the Vrije Universiteit Amsterdam (Free University of Amsterdam) (VU), the VU online library was used to access them.

Inclusion and Exclusion: Literature inclusion or exclusion was based on relevance and there were not language or geographical restrictions. Most literature used where however, those published in 2015 and beyond.

2.3.2 DESK STUDY

The desk study was done at two levels. The first involved Outpatient Department (OPD) trends of eye condition as captured by the Talensi District Health Directorate (DHD) and the Talensi District Hospital (TDH). The second was retrieval of information from the National Eye Care Unit (NECU) using the WHO's Tool for the Assessment of Glaucoma Services (TAGS) as a guide⁴².

2.3.3 PRIMARY DATA COLLECTION

For the primary data collection, ethical approval was sought from the ethical review committee of KIT and the local ethical review committee, Navrongo Health Research Centre (NHRC) ethic review committee before start of field work. All participants consented to participate in the study. Focused Group Discussions (FGDs), In-Depth Interviews (IDIs) including key informant interviews and observations were methods used in primary data collection. Use of vignette was employed in FGDs and IDIs to triangulate expressed perceptions and practices. For this study, the TDH and the Datuku Sub-District (DSD) were used to represent the district and sub district levels.

The Talensi District was chosen because it represents an average district in the UER of Ghana in terms of health needs, population, and distance from regional capital, socio economic status among others. Details of primary data collection is contained in protocol attached.

Category	Number from district	Number from Sub district
Clinical nurses	1	1
Community health nurses	1	1
Physician Assistants	2	1
Ophthalmic nurses	1	0
Optometrist	1	0
Traditional healers	1	1
Health promotion officer	1	
Key Informants		
Ophthalmologist	1	
Representative of Talensi DHMT	1	

TOTAL	10	4
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Table 2.1: Summary of participants for IDIs, Talensi District, Ghana.

2.3.1 CONCEPTUAL FRAMEWORK

The framework used is an incorporation of WHO building blocks for health and the Ghana Health Service (GHS) levels of service delivery model.

The middle highlighted portion of the framework shows the direction of influence as far as knowledge, perceptions and practices are concerned. It can be seen that; the district level is influenced by secondary level factors and factors within the district level. The sub district is influenced by district and regional level factors mainly.

At the far left are factors that influence knowledge, perception and practice across the three levels and are therefore discussed under influencing factors. These factors are mostly determined by national policies and intervention directives.

The far right are boxes demonstrate the ideal flow of practice and linkages within the concept of early detection and optimal management of glaucoma patients. High risk patients are identified at the community and Health Centre by CHNs and Health Centre staff respectively. These do the first level activity of referring high risk clients to the ON at the district level. The district level ON in turn screen for high risk patients and refer suspects to the regional level for the ophthalmologist to confirm and initiate management. Once management is initiated the ON monitors and continues treatment at the district level and refers back to the Ophthalmologist when the need arises or after a certain number of months based on regional protocols.

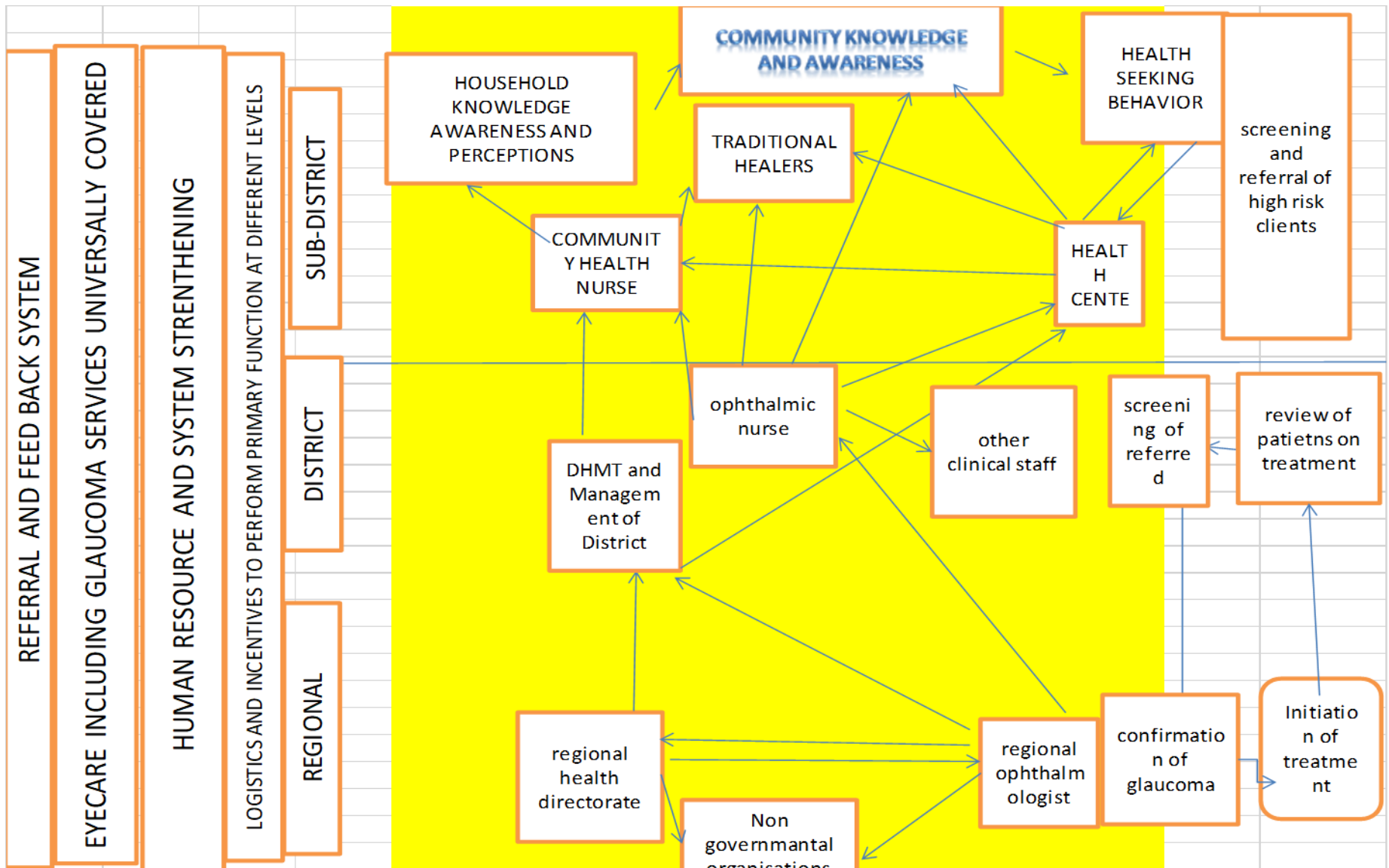


Figure 2.1 : Conceptual framework for glaucoma care at a primary level in Ghana.

CHAPTER THREE: FINDINGS

This section presents the data gotten from the different methods used. It starts with background information of the participants of the study, then summarizes and analyses the key findings of the literature search done. It then presents the desk study under what was found at the national and district level. This is followed by an analysis of the knowledge of PLHWs at the district and sub district levels regarding glaucoma. The fourth part under this section looks at the practices and perceptions of primary respondents. This part will be analysed under regional, district and sub district levels. The last part in this section will analyse the various factors that influence the knowledge, perceptions and practices of PLHWs in the Talensi District regarding glaucoma.

3.1 BACKGROUND

The study involved twenty-six participants made of one Ophthalmologist, one Ophthalmic Nurse (ON), eight Clinical Nurses (CNs), ten Community Health Nurses (CHNs), two Nurse Prescribers/Physician Assistants (NPs/PAs), one Health Information Officer (HIO), one Health Promotion Officer (HPO) and two Traditional Healers (THs).

The only ON in the District has been working in the TDH for a year and previously had done an internship at the Presby Regional Eye Centre (PREC) where she assisted in consultations and surgeries. She had over two years of experience working as a CN in the sub district level before going to pursue a specialty in ophthalmic nursing.

The NPs/PAs who were interviewed had between two and three years of working experience in the TD. CNs were made up of Registered General Nurses (RGN) and Health Assistants. They had worked in the district for between one and three years.

CHNs interviewed had between one and four years of working experience. The HIO and HPO were both one year working in the district and the Traditional Healer (TH) had worked in the district for over 17 years (see table 3.1 below). Observatory study included the TDH which is the only hospital in the Talensi District and the PREC, the only tertiary eye facility in the UER of Ghana.

During the field study, the CMNs and CNs at the sub district level could not constitute the minimum of four participants that were needed for a FGD. They were therefore no FGDs at the sub district level. The District Director of Health Service for the Talensi District could not be interviewed because of her unavailability, however the HIO and the HPO interviewed were both senior staff of the Talensi District Health Directorate. Below is a table summarizing details of participants for the qualitative study.

Participant category	number	Study type	gender	Duration of work
ophthalmologist	1	Key informant	Male	➤ 11years
Ophthalmic Nurses	1	IDI	F	1 year
Physician Assistant/Nursing Prescriber	2	IDI	2 males	2 – 3 years
Clinical Nurses	8	FGD / IDI	3 males 5 females	1 – 3 years
Community Health Nurses	10	FGD / IDI	3 males 7 females	1 – 4 years

Table 3.1: Details of participants for FGDs and IDIs, Talensi District, Ghana.

3.2 LITERATURE REVIEW

The Government of Ghana (GOG) is the major employer of most frontline Human Resource for eye Health (HReH) in Ghana, employing of 70% of them⁴³. Ghana is doing well at attaining national targets for various eyecare workers as set by VISION 2020⁴⁴ ⁸. A major challenge however has been the poor distribution of these workers. it was demonstrated in 2011 that, two of ten regions (GAR and AR) accounted for 78 % of the 55 ophthalmologists in the country. In the same study, Eastern Region accounted for 7% of the remaining 22% Ophthalmologists with Western and Upper West Regions not having any at all⁸. In the case of ONs, UER and GAR surpassed the targets currently being used in the country, Western and Brong Ahafo Regions had values below this target⁴⁴. For another key eye care provider in Ghana, the Optometrist, in 2013, two regions accounted for 62% of Optometrists in Ghana, while five regions did not have any optometrist at all⁸.

An Assessment by Potter et al in 2013 showed that, budgetary support from the GOG to the eye sector was almost absent with majority of its funding over the years being from international and local donors⁸. The possible reason for this low prioritization of eye care service was stated as the wide bureaucracies between the NECU and the MOH. In a 2013 Eye health system Assessment (EHSA) report, it was stated that for more than 10 years, the only major funding that NECU had from GOG was procurement of equipment for the diagnosis of glaucoma to all the 10 regional hospitals in the country in 2011⁸.

Eye care in Ghana is focused on curative rather than preventive services⁸. Some possible reasons cited for this include the long timescales for results with regard to preventive interventions associated with a difficulty attracting investment in preventive as compared to curative services⁸.

The prevalence of Glaucoma has been found to be higher than 6% in all population based and hospital based studies conducted in the country^{19 33} **Error! Bookmark not defined.**⁴⁵ with some reporting an overall prevalence of about 8.4%. This is much higher than global prevalence quoted in three global meta-analysis done on visual impairment which quote a global prevalence of between 2 and 3.54% ^{26 27 28 46}. Studies in Ghana show possible differences among ethnic groups in the country as reported by Ntim-Amposah et al who found a glaucoma prevalence of 9.4% among the Akwapims ⁴⁵ (even higher than the overall prevalence of 8.4% in that particular study).

Francis et al and Ntim-Amposah et al, in separate hospital based and population based studies respectively, demonstrated that, the commonest form of glaucoma in Ghana was POAG^{45 47}. In their study, Francis et al detected no single case of close angle glaucoma among the rural patients while only 1.2% cases of close angle glaucoma were diagnosed in the urban group compared to about 90% POAG/POAG suspects⁴⁷. Ntim-Amposah et al, had over 94% patients with glaucoma being of POAG type while less than 6% were chronic close angle glaucoma⁴⁵. This is in line with global studies that found that the commonest form of glaucoma among Africans was POAG⁴⁶.

In comparing clinical features of glaucoma patients in rural and urban settings, Francis et al demonstrate that, patients in the rural setting were more likely to have poorer clinical features. The mean IOP at presentation was higher in the rural setting (39.2+/-7.1mmHg) compared to patients in the urban setting who presented with a mean IOP of 31.8+/-7.3mmHg. 62% of rural dwellers presented for treatment with an IOP greater 40 mmHg while only 6.8% of patients in the urban hospital had IOP higher 40mmHg. Patients at the rural setting were more likely to present with blindness (by WHO classification)¹⁷, with 34.1% presenting with bilateral blind and 52.2% presenting with blindness in at least one eye. Contrary to these figures, only 17.5% and 32.9% of patients at the urban hospital presented with bilateral blindness and blindness in at least one eye respectively. In the same study, urban dwellers were more likely to present with early disease, with 41.9% of patients presenting as POAG suspects among urban dwellers compared to rural dwellers who had only 10.3 presenting as POAG suspects⁴⁷. Ntim-Amposah et al had a similar finding in their study in a rural district where 93% of those who were detected to be leaving with glaucoma did not know they had it at the time of the study⁴⁵.

In Francis et al study, more than 20.0% of patients were diagnosed with glaucoma under the age of 40 years in both rural and urban settings⁴⁷. This support an earlier study done in Bawku District of Ghana where a retrospective review of patient records showed that 26% of glaucoma patients operated in the Presby Hospital were below 40 years⁴⁸.

The ICO and other bodies' recommendations of early detection in order to prevent blindness in glaucoma patients as well as evidence of high rates of undiagnosed disease in populations^{20 49 12 13} have prompted studies into the clinical and economic benefits of screening populations for glaucoma^{50 51 52}. The World Glaucoma Association (WGA) reviewed evidences from previous studies and recommendations regarding screening for glaucoma. Using the Wilson and Junger criteria⁵³ and more recent evidence, the WGA concluded that, evidence was stronger now for glaucoma screening⁴⁹. However, the working group could not give any threshold glaucoma prevalence above which population based screening was highly recommended. They however recommended screening of high risk groups.

IOP measurement is usually the simplest screening done people at high risk for glaucoma. This is however affected by the thickness of the cornea (front clear part of eye ball). A thinner Central Cornea Thickness (CCT) leads to lower than normal IOP while thicker CCTs lead to higher than normal IOP. It is therefore recommended that the CCT should be factored in in measuring the IOP. The CCT is sometimes affected amount the amount of tearing or dryness of the cornea at the time of the measurement. The instrument for doing this is a pachymeter^{54 12 13}.

In a study to evaluate the efficacies of commonly used anti-glaucoma drugs in the country, Koffour et al observed that up to 58.03% of the patients on mono/combination therapies with Timolol, Pilocarpine, and Acetazolamide were stopped on them because they either did not

adequately control the IOP, or because patients reacted or suffered side effect of using these drugs⁵⁵. In the same study, latanoprost, a drug recommended by ICO/WHO²⁰ for use in low resource settings was shown to reduce IOP of patients to expected target values of 19-22mmHg, while timolol did not achieve this. In comparing percentage reductions in IOPs, the mean reduction achieved by latanoprost was between means of 47.2% and 48.8%, while that achieved by timolol was much lower figure between 12.9% and 19.6%⁵⁵.

When combinations of the medications were reviewed by Koffour et al, Timolol-Latanoprost combination accounted for the highest mean reduction in IOP in both eyes with 63.7% mean reduction in the right eye and 61.4% in the left eye compared to much lower mean reductions achieved by combinations involving timolol, pilocarpine and latanoprost⁵⁵.

3.3 SURVEILLANCE SYSTEM AND TRENDS OF EYE CONDITION

Surveillance and reporting of health events in Ghana is done via the District Health Information Management System (DHIMS2). DHIMS2 is deployed to all districts in the country and is regularly updated to reflect all the important health events in the country. Data cleaning and entry is done by the HIO. District information was derived from a profile of the Talensi District compiled by the Talensi District Assembly^{9 56 57}.

3.3.1 HUMAN RESOURCE FOR EYE CARE AND EYE CARE FACILITIES SITUATION IN GHANA

The table below summarizes the Human Resource for eye health (HReH) distribution as at October, 2016.

Cadre	Key Competence	Target	Availability In Ghana		
			Needs	Availability	Gap
Ophthalmologists	Leadership, Surgery	1/250,000	112	97	15
Optometrists	Correction of refractive errors	1/250,000	112	320	Excess of 208
Ophthalmic Nurses	Diagnosis, treatment, wards, theatre	1/100,000	280	520	Excess of 220
Opticians	Fixation of spectacles referrals	1/100,000	280	200	80
PECW	Basic treatment and referrals	1/10,000	2,800		
CHW	Eye Health promotion	1 / 10,000	28,000		

Table 3.2: Eye care provider situation in Ghana in 2016. Source: NECU, Ghana.

In Ghana, every ophthalmologist is supposed to do cataract surgery except for some of the older ophthalmologists who did not do cataract surgeries. However, there were only three ophthalmologists in the country who were considered to be glaucoma specialists because they had short courses in glaucoma management including laser treatment. While the targets in terms of national population were being met in some cadres of eye professionals, there were

gaps in distribution. Also, the targets even when achieved for all the cadres, will still be have issues with the distribution of the key personnel.

On the distribution of optometrist, while Ghana had exceeded the national targets, only three out of 13 districts in the UER had an optometrist. The Talensi District where the study was done did not have an optometrist. The same can be said for ophthalmic nurses in other regions such as the Upper West and Northern Regions of Ghana.

The demarcation of districts is based on a population size between 100,000 and 200,000. So, using population benchmark of 250,000 as the denominator for an optometrist will mean a good number of districts will not have the services of an optometrist even when the targets are met. This is evidenced by the absence of an optometrist in the Talensi District at the time of the study. Also, based on workload differences at the different levels of service delivery, teaching hospitals and specialist hospitals where ophthalmic surgeries are done, will attract a higher number of ophthalmic nurses leaving a lower number for the general regional and district hospitals to pick from, again leading to a maldistribution among the general hospitals. Based on a workload analysis conducted in Ghana with support from the WHO⁵⁸, the number of ophthalmic nurses needed in district hospital ranged between an average of 1.5 at the lowest district hospital to 4.5 in bigger district hospitals. These cannot be met with the above targets.

For facilities that provide eye services, it was indicated that all tertiary facilities like Korle Bu Teaching Hospital, Konfo Anokye Teaching Hospital, Tamale Teaching Hospital, Cape Coast Teaching Hospital and 37 Military Hospital have eye care service facilities. All 10 regional hospitals also have facilities for eye care and most district hospitals also. There are also Christian Health Association of Ghana institutions with eye care facilities. Details were however not provided in terms of glaucoma service provision.

3.3.2 TECHNOLOGY AND MEDICINES AVAILABLE FOR DIAGNOSIS AND MANAGEMENT OF GLAUCOMA IN GHANA

There is modern technology for the diagnosis and management of glaucoma in the country even though inadequate. There are three facilities that provide laser surgeries for glaucoma.

Medicines available in the market included the following Timolol, Levobunolol, Pilocarpine, Acetazolamide, Latanoprost, Bimatoprost. The commonly used ones however were Timolol, Acetazolamide and pilocarpine. Latanoprost and Bimatoprost were not covered by the NHIS probably because they were expensive. Prescription of anti-glaucoma medicines were done at the district, regional and tertiary levels only.

Investigative procedures like Schotz and applanation tonometry and Visual Field Test were not covered under the NHIS. By WHO essential medicine list⁵⁹, the coverage of glaucoma medicines by the Ghana NHIS will be best described as fair while coverage of essential investigations is inadequate.

3.3.3 TREATMENT GUIDELINES FOR EYE AND SUPPORT FOR GLAUCOMA CONTROL IN GHANA

Ghana has a Standard Treatment Guideline for specialized eye care providers including glaucoma care which could be accessed from the Ghana National Drug Program website. There was however no such guideline for non-specialized eye care providers.

There was no devoted program for glaucoma as it was part of the eye care service delivery. Some few health facilities ran 'glaucoma clinics' but have no standardized guidelines and protocols.

There were 2 groups involved with glaucoma in Ghana; the working group of ophthalmologists, a sub-committee of the Ophthalmological Society of Ghana and the Glaucoma Association of Ghana which is actually a patient support group made up of people with glaucoma who came together to support each other and to create public awareness. Primary Level Health Workers (PLHWs) in the Talensi District however did not know about the activities of these groups.

3.3.4 DISTRICT LEVEL

Eye conditions are among the top ten conditions seen in health facilities in the Talensi District (figure 3.1). As can be seen below, there is little segregation of the eye conditions as most are reported as acute eye infection. Of the 2059 eye cases that were seen in the Talensi, 2035 (98.8%) were reported as eye infections and 24 cataract cases with no mention of suspected cases of glaucoma (figure 3.2). This is in contrast with the figures from the TDH which showed acute eye infection accounted for 585 cases (61.5%) while cataract accounted for 366 (38.5%) of the eye conditions reporting to the hospital (figure 3.3). This is in clear contradiction with reports from sub districts which is probably due to the presence of an ON in the TDH. No glaucoma case was however reported at the district level. With a glaucoma prevalence of 6.8% in the country, it is expected that over 6000 people will be living with glaucoma in the District of about 90,000 people^{7 9}. This lack of suspicion might be due to inaccurate or no screening of high risk patients in the TDH.

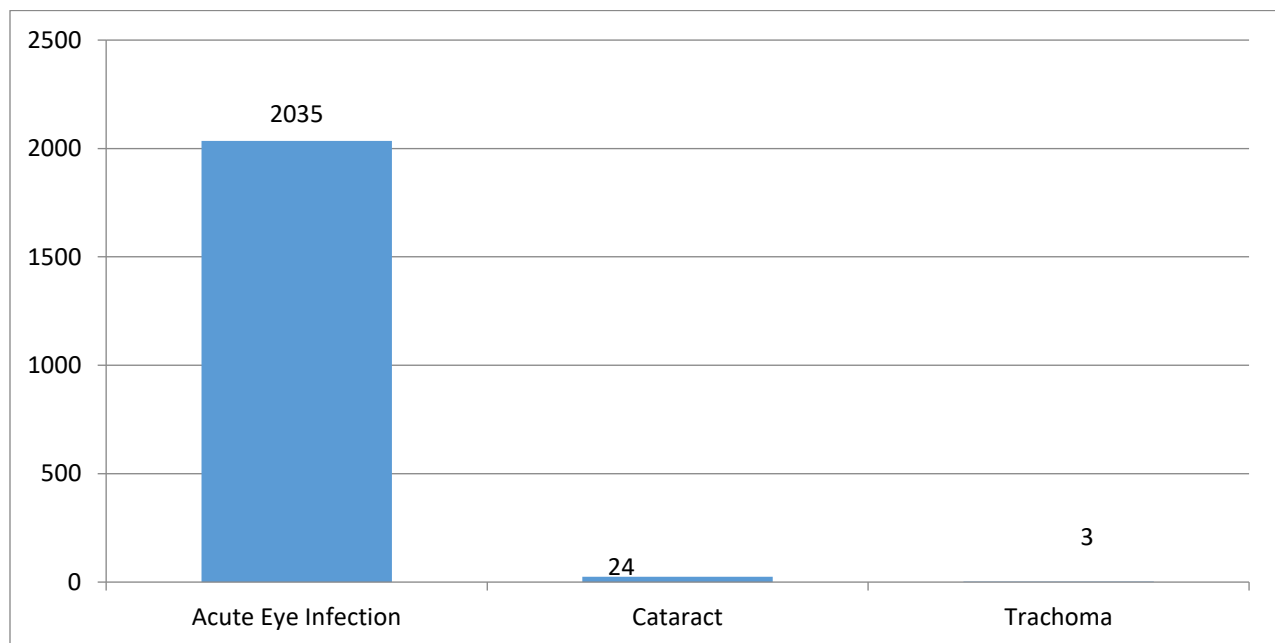


Figure 3.2: Eye Condition Seen in Health Facilities in Talensi District, Ghana, In 2016

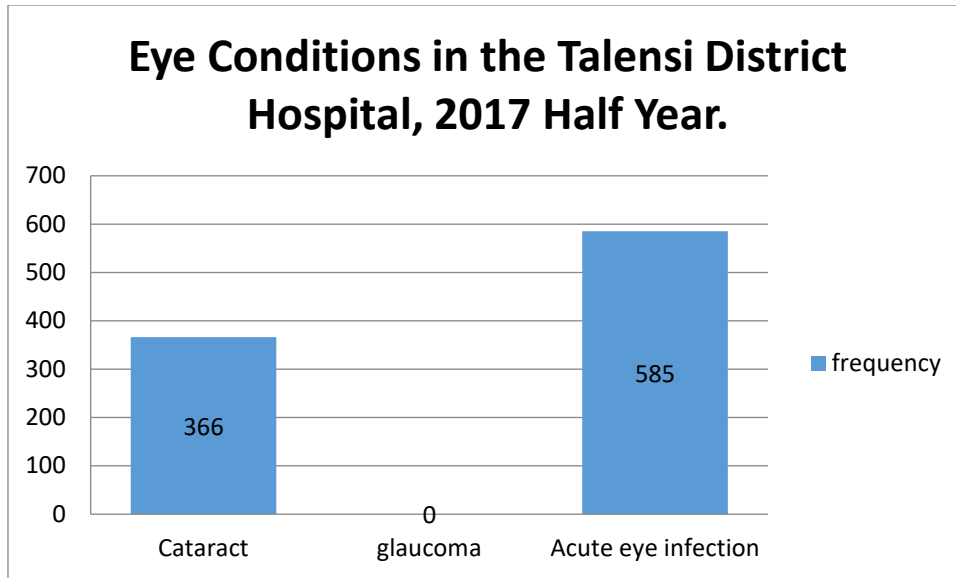


Figure 3.3: Eye conditions seen at Talensi District Hospital

3.4 KNOWLEDGE ON GLAUCOMA

3.4.1 TALENSI DISTRICT HOSPITAL

Five broad categories of clinical staff were identified to play a role in eye care at this level of which four were included. Ophthalmic Nurses (ON), Physician Assistants (PA), Clinical Nurses (CNs) and Community Health Nurses (CHNs) were the categories included in the study while the Medical Doctor was excluded because he was not available at the start of the study.

The ON had a year's training in eye care including identification and management of glaucoma at the ophthalmic nursing school. She said POAG is usually without any symptom because it affected the peripheral vision first sparing. Patient sight is silently taken away in the process according to the ON. When she was probed on any other possible symptom of glaucoma the ON said patients usually had difficulty seeing at night.

"..... The night vision, the glaucoma starts from the temporary sight and move to the centre, so when it starts to destroy the nerve there It equally destroys the rods as well and the rods are responsible for seeing at night..." (according to the ON).

She also mentioned frequent change of glasses as another pointer to glaucoma. Family history of glaucoma, raised IOP, African race, age above sixty years and female sex were spontaneously mentioned as some risk factors for developing glaucoma.

Asked what she felt about steroid use, she said chronic use of steroids was harmful to the eye. Funduscopy, IOP measurement and visual field test were mentioned by the ON as investigations done to diagnose glaucoma. Early detection and management were mentioned by the ON as important in glaucoma care.

".. You can detect it early and put them on medications and if they are able to go through the medications even though it won't improve the vision but it would maintain

the vision..." "...It depends on the vision he comes with. If he comes and the vision is blind, that is it" (ON said in response to treatment outcomes)

Trabeculotomy and trabeculectomy were mentioned by the ON as glaucoma surgeries done for patients in the UER. She was however ignorant of laser surgery for glaucoma in the country.

PAs are clinical nurses who have been given about 18 months of additional training to do general prescription at the OPD. The PA interviewed at the TDH felt that blindness could affect any age and sex but middle age and aged were worse affected in Ghana. Cataract, diabetes and trauma were mentioned as some common causes of blindness. On glaucoma, the PA mentioned Family history, raised IOP and hypertension as risk factors and that it was curable when detected early with visual loss being reversible.

As part of their training as contained in their training Curriculum, CNs (registered general nurse category) are expected to acquire knowledge and skills in health promotion, identification and management of common eye conditions that present to the OPD including cataract and glaucoma. The curriculum specifically mentioned knowledge in visual acuity test, tonometry and ophthalmoscopy. I did not retrieve the curriculum for the training of CNs (Health assistant category), - who are given a shorter duration of training (2 years) to assist RGNs in their practice.

CNs at the TDH mentioned old age, trauma, hereditary, hypertension, diabetes, exposure to dust as risk factors for becoming blind but did not know the risk factors for glaucoma.

On glaucoma, the CNs mentioned 'heavy eyes' and eye pain as symptoms. They were almost equally divided over the treatment outcome for glaucoma, as to whether it was curable or not, and whether visual loss was reversible or not. A few others in this group felt visual loss from glaucoma could be improved with glasses when detected early

The curriculum for the training of CHNs in Ghana could not be reviewed for this study.

CHNs at the TDH mentioned risks/causes of blindness to include; old age, hereditary, congenital eye infections acquired from female genital tract, infection spread by flies contact with eyes, consumption of "bitter salt", consumption of "kola", excessive work under the sun, prolong viewing television, reading in dim light, dusty environment, ignorance and diabetes.

On glaucoma, CHNs at the TDH mentioned causes/risk factors to include old age, trauma, diabetes, poor access to water, lack of vitamin A and the use of certain dye around the eye as practiced predominantly by Muslims in the country.

"... it is an infection that changes the colour of the eye so when it happens like that it is difficult for the person to see" (according to a CHN at the TDH about glaucoma).

CHNs at the TDH were divided as to whether glaucoma was curable or not with some insisting that it was curable by medicines and surgery

Conclusion: As far as glaucoma is concerned, the ON exhibited very good knowledge of risk factors, screening tests, treatment modalities and outcomes. She was however sometimes inconsistent regarding symptoms. The PA, CNs and CMHs all had limited knowledge on glaucoma. Some CNs and CHNs exhibited a fair knowledge of treatment outcomes. What was quite inconsistent is, when this information is triangulated with health information data from the TDH was the zero reporting of glaucoma cases from the hospital.

3.4.2 DATUKO SUB-DISTRICT

The clinical staff at this level include Nurse prescribers (NP), CNs and CHNs. The Traditional healer (TH) will be considered under this level.

The NP are CNs who acquired the skill of prescribing through on the job coaching and mentorship. They are however paid as clinical nurses.

The NP mentioned causes of blindness to include glaucoma and cataract and Risk factors for glaucoma to include family history of glaucoma, infection and old age. He said that visual loss from glaucoma was irreversible and glaucoma was not curable.

The only CN who was interviewed at the DSD was of the Health Assistant category. She felt that blindness could be caused by eye infections acquired from the genital tract in the process of delivery and trauma. She said she did not have that much experience with glaucoma.

The CHN that was interviewed at the DSD mentioned infections that changed the colour of the eyes and glaucoma as common causes of blindness and felt that glaucoma was not curable.

The TH used the term "samkwa" to refer to a common cause of blindness in the local dialect. He said the "samkwa" first affects the teeth, then spreads to affect the eye causing blindness in the process. This, he said, is associated with 'dirt'. The TH explained that its transmission was through sharing common drinking cups.

The TH described two types of eye conditions that could lead to blindness, the first type did not have a white coloration of the eyes and occurred when a person inhaled smoke from the fire of "dwarfs" (spirit beings) cooking". The second type he said occurred when someone is cursed for sleeping with a married woman. For this one, he said, had a white coloration of the eyes.

"If you don't respect people when you see them and insult them, spiritually they can invoke blindness on you" "... To insult is not actually insulting the person as the word insult connotes but it has to do with someone having sexual affair with another person's wife....". (explained by the TH as a cause of blindness).

The TH noted that blindness that resulted from the 'clear lens' eye condition was much easier to treat compared to the one with a white coloration of the lens.

Conclusion: While the NP's knowledge of glaucoma could be described as limited, it was mostly same as the PA at the TDH and sometimes better especially regarding treatment outcome for glaucoma. The knowledge of CN was limited, she said that she had very little knowledge and experience with glaucoma. The CHN at the DSD exhibited mostly incorrect knowledge regarding glaucoma, a few times, worse than the CHNs at district level who were interviewed otherwise same.

3.5 PERCEPTIONS AND PRACTICE

The findings here are similar to the findings for knowledge and are presented according to level of service delivery.

3.5.1 TALENSI DISTRICT HOSPITAL

The ON attends to patients who present to the Eye Unit or who are referred from other departments of the hospital and from sub districts. She mentioned conjunctivitis, allergies and pterygium as commonly encountered condition in the TDH.

For Glaucoma, she reviewed patients already on treatment including prescribing their routine medicines for them. The ON indicated that, she measured the IOP, visual acuity and papillary light reflex of patients depending on their presentation. She said that any time she was confronted with patients with "very high" IOP she initially managed them on oral acetazolamide before referring them to the PREC.

She also organises Outreaches to sub districts within the Talensi District to provide eye care services and education to community members. Cataract is commonly screened for while fundoscopy is done for eligible clients during outreaches.

Glaucoma, cataract, staphylomas, deep lid lacerations and cornea lacerations were among eye conditions she commonly referred to the PREC.

The ON said she educated other clinical staff (mostly prescribers) at the TDH during a clinical meeting once since her posting to the facility. This was on general eye conditions.

The ON thought that blindness was a problem as a good number of people were affected (could not quote any figure or proportion) in the district but little or no support was given to such patients by relations.

"... Someone picked a folder from the O.P.D and was coming to the Eye Unit and fell and had injuries on the knee because he did not come with a relative. I do not want to use the word that they are neglected but that is it." (an obviously unhappy ON narrated).

She also mentioned patient compliance as a challenge she faced at the eye unit.

The PA had little to share regarding his perceptions and practices regarding glaucoma explaining that since the arrival of the ON, all eye conditions were referred to the eye unit.

CNs at the TDH provided care for in-patients and out-patients. They do patient education as a part of their work. They however hardly did health promotion in eye conditions including glaucoma. All the CNs interviewed at this level said they had never received any In-Service Training (IST) on any eye condition since their posting to the district. On glaucoma, CNs at the TDH said they had very little experience with it since most eye conditions were referred to the eye unit.

CHNs at the TDH said that the health education and promotion they did during home visits depended on health issues that were encountered in the households. At the facility, health promotion depended on the season and the health condition that was common.

Since their posting to the district, CHNs at the TDH level said they had never received any IST on glaucoma or eye care.

"...they want people who are eye specialists..." (Remarked by a CHN at the TDH as possible reason why they had not received an IST in eye care)

CHNs at the TDH also mentioned that when they encountered blind people during home visits, they educated the relations on how to provide care and support for the patient but did not refer them or their relations to the hospital.

“When you go for a home visit and you see a blind man in the house. It is a case you have found like that so as a preventive nurse you have to talk about how they should be supportive to him, talk about personal hygiene, bathing and washing of the face”. (Remarkd CHN at the TDH).

Some of the CHNs from the TDH felt that they were ill equipped to face eye care issues during home visits including providing education or first aid when the need arose.

Conclusion: At the level of the TDH, the ON demonstrated good practices and perceptions in line with current recommendation regarding glaucoma. She was able to do all basic pre-confirmatory screening for high risk patients before referring them to the PREC for confirmation. She also reviewed already diagnosed glaucoma patients that reported to the TDH. PAs, CNs and CHNs at the TDH did little in their practice in line with early detection and management of glaucoma.

3.5.2 DATUKO SUB-DISTRICT

The NP indicated that he mostly attended to eye infections and foreign bodies in the eye, referring any other condition to the TDH. He did not have any practical experience regarding glaucoma to share. The CN also said she had no experience with caring for glaucoma patients.

“For our setting, we don’t go into details like that. Immediately you come to complain about blinding eye problem there is nothing we can do than to refer” (remarkd the CN at the DSD).

CHNs at DST shared similar experiences as those at the TDH regarding their practice and experience with glaucoma.

The TH said he treated the blind by giving oral herbs but in addition he gave eye drops he prepared from herbs.

“...normally I treat the teeth before the eyes because if you do not treat the teeth first, you cannot treat the eyes” “.... there are some to use to wash the mouth and some to be used as eye drops” (TH explaining how he treated eye conditions).

He said he sometimes he sent patients to the hospital for aspects of patient care that he could not do and also received referrals from the health facility as well.

“for instance, the person with the eye and teeth condition if I treat the person’s mouth he loses some blood and fluid since the treatment process is like draining water and blood from patients. So, he has to go to the hospital to get back his blood and water before coming back for me to finish with the eye treatment”. (The TH explained in response to how he collaborated with the hospital).

Conclusion: The NP, CN and CHN did little in their practice in line with early detection and management of glaucoma just like those at the TDH. The perceptions and perceptions of the TH was not in line with current evidence regarding detection and management of glaucoma suspects.

3.6 INFLUENCING FACTORS

Even though most factors that influence the knowledge, perceptions and practices of PLHWs act across the various levels of care, they will be discussed under the various levels of service delivery in an attempt to bring out the levels that are overall affected most.

3.6.1 REGIONAL LEVEL FACTORS

During the field visit, I observed that the PREC had equipment for diagnosing and managing glaucoma patients. Some of the equipment seen in use were visual field machines and IOP measuring machines. Glaucoma surgeries were also done alongside other eye surgeries. Laser surgery for glaucoma was however not available at the PREC at the time of the visit. Variety of anti - glaucoma drugs were available including timolol and latanoprost under the brand name xalatan. Fixed combination eye drops were however not routinely available.

The team at the PPREC was headed by an ophthalmologist supported by ophthalmic nurses and optometrists. The ophthalmologist was the only one conducting glaucoma surgeries at the PREC during the field study.

Conclusion: The PREC had the requisite capacity in terms of personnel, medicines and equipment to confirm and manage suspected cases of glaucoma in the UER of Ghana.

3.6.2 TALENSI DISTRICT HOSPITAL

During the observation of the TDH and in interaction with the ON, it was noticed that the hospital had facilities for measuring the IOP (Schiotz tonometer), examining the optic disc (Ophthalmoscope), eliciting a pupillary reflex (pen torch) and measuring the visual acuity of patients (Snellen charts). There was however no equipment for refraction. The absence of a separate room for the eye unit was affecting eye care delivery.

The TDH had no equipment and facilities for eye surgeries. Timolol was the only available anti-glaucoma medicine in the dispensary of the TDH at the time of the visit.

At the TDH, the ON and the medical officer (Medical superintendent) were the clinical staff with both theoretical and practical training in early detection and management of glaucoma in patients. The medical officer however attended to general OPD conditions. The Talensi District did not have an optometrist.

There were no guidelines on glaucoma, other eye diseases or even use of potentially harmful eye drops at the OPD. At the Pharmacy, there were no guidelines on dispensing of topical eye drops particularly steroids though folders randomly selected from the pharmacy revealed routine prescription of ciprofloxacin-dexamethasone combination even at a time that the ON was on leave.

The only reference book on eye conditions available at the time of the visit was the Ghana Standard Treatment Guideline for general medical conditions. However, its content was not suitable for use by PLHWs for glaucoma risk identification and referral.

Contrary to the policy on referral in the GHS⁶⁰, the non-specialised clinical staff at the TDH mentioned that, they did not receive feedback for referrals that were made to the eye unit of the TDH.

Transport to travel to areas with poor road networks such as DSD was sighted by the ON as a reason for not being able to visit the DSD for her routine outreach programs to the sub districts

The ON narrated that “Yes with my “Mapuka” motor bike with this stony road” when she was probed on why she had not organised an outreach to the DSD yet.

Format for health reporting of health promotion activities did not have section to report on health promotion on eye conditions.

Conclusion: The TDH has the requisite capacity in terms of personnel (ON), medicines and diagnostic equipment to screen high risk patients for pointers of glaucoma before onward referral to the PREC. The absence of equipment for refraction hindered the provision of a complete package of basic eye care for patients at the district level. guidelines, reference materials and feedback for referrals were other areas of weakness identified.

3.6.3 DATUKO SUB-DISTRICT

At the DSD, there was no single available equipment including pen torches and Snellen charts for examining the eye. Understandably, there was no anti glaucoma medicine at the DSD since this level of care was not licensed to prescribe these medicines

The DSD did not have any specially trained staff with skills in early detection and management of glaucoma or promoting awareness on glaucoma and other eye conditions. Just like the TDH, there was not reference material at this level for eye care.

Concerning referral, staff at the DSD also said they were not getting feedback for the referrals they made to the eye unit of the TDH or the PREC.

Also mentioned by participants at DSD was the challenge of transport during referrals. This they said, even included commercial vehicles that were only available once every three days.

“... Anytime you need to buy something from town. You need to wait until somebody else is going to town and you message the person, or you have to ride a motor bike to town and if you don’t also know how to ride a motor bike, it means you have to beg someone else to carry you to town” (cited by some participants at the DSD regarding challenges with glaucoma).

Staff at the DSD remarked that supportive supervision from the DHD was effective and motivated them to want to do more. This however did not include eye care.

Fuel for home visiting was mentioned to be erratic and sometimes affected home visiting by CHNs.

Also present at the DSD was the TH who provided eye care service to a wide range of patients but who was not known to staff of the district including some of the DHMT staff interviewed.

3.6.4 FINANCE

Glaucoma drugs and services were not well covered by the NHIS.

The regional ophthalmologist had this to say- "So a lot needs to be done in the direction of glaucoma. Even there are new drugs coming, the combination drugs which are not covered at all. For glaucoma treatment, we still need to push for the health insurance to include most of the drugs because it is a disease that is affecting quiet a number of people".

There were no NGOs or international donor agencies supported programs in the area of glaucoma and other eye services in the whole of the Talensi District.

3.7 CRITICAL REVIEW OF METHODOLOGY

The use of an exploratory method allowed for participants to bring out their perspectives on issues that were being discussed and led to new themes that will not have been considered in designing close ended questionnaire.

In the consent form, it was mentioned explicitly that the study was going to be about glaucoma with an associated tendency of biasing the responses of the participants during the vignette towards glaucoma. It probably did not affect it much since in the course of the study, quite a number of the participants could not relate the vignette to glaucoma.

The choice of one of the very difficult to reach areas for the sub district analysis was good as it brought out a balance to challenges faced by the very remote areas compared to the less remote areas like the district capital. However, I could not get up to four CNs or four CHNs (four was minimum number of participant set for FGDs) needed to form groups for FGDs. Meanwhile, at other sub districts I could have gotten more than eight of each category pointing to an uneven distribution of human resources. This therefore affected the number of FGDs that were done during the field trip.

While focus of study was on the perspectives of PLHWs in the Talensi District, exit interviews with patients could have been an additional source to triangulate data on practices and perceptions. Observations of clinical staff working would have provided another source to triangulate information from participants.

CHAPTER FOUR: DISCUSSION

This section aims to provide a better understanding of the available opportunities for improving glaucoma care in Ghana as supported by global and local evidences as well as challenges faced in Ghana in trying to do so. For this, the global and local evidences will be discussed first, then compared with the current situation as far as National response to glaucoma care. The last sections will discuss findings from the field study regarding knowledge, perceptions and practices of PLHW in the Talensi District concerning glaucoma.

Ghana as a country presents quite a different picture regarding glaucoma compared to the rest of the world. I will therefore repeat a very few of these quickly for the sake of emphasis before proceeding to the substance of the discussion. Ghana presents a high population and facility based prevalence of glaucoma that seem to be higher among certain ethnic groups. An unusual presentation that came out during interaction with an expert was the usual high numbers of young adults below the age of 40 years suspected to be affected. Even though this is supported by two different studies done in different groups^{45 48}, it is still odd compared to the other prevalence studies in the country and the global picture discussed earlier.

4.1 GLOBAL AND LOCAL EVIDENCE

Global prevalence of glaucoma is estimated to be between 2% and 3.54%, much lower than the estimated prevalence in Ghana which is between 6.8% and 8.4%.

Current studies on the control of glaucoma are unanimous in recommending that the key to control of glaucoma is early detection and initiation of treatment to prevent progression to blindness. While studies in high income countries thought that prevalence was too low in their settings to recommend populations based screening (such as screening everyone above 40 years), the same cannot be said about Ghana where prevalence is obviously among the highest in the world. However, key issues such as the economic benefit of community based screening as well as some adverse effects that come with such screening will hold true to a large extent in Ghana. The recommendation of screening of high risk people for glaucoma is applicable in the global setting including Ghana. What is not clear is the best approach to identifying and screening high risk groups as different settings present different challenges and opportunities. A concept mentioned by experts during the field study and which is being discussed in the global front, is the opportunistic screening of patients that present to eye units. The question that arises again is whether everyone who presents to the eye unit should be screened including children with no risk factors? Or should this also be guided by risk factors of glaucoma that the individual present with? The potential challenge that such a method presents is in settings where accessibility (geographical, financial, etc.) to health service including glaucoma services is very poor. A lot of people, especially the poor and the vulnerable who are usually worse affected by glaucoma in this case might be excluded.

Another approach for a lower middle income country will be to use the already existing structures to create awareness in the communities and design a system that screens clients at different levels. Such that, screening at the community non-specialized level will be focused on high sensitivity but less specificity, looking out for high risk groups. While at the top level, there is a more specific confirmatory test and treatment available and geographical/financially accessible. Also, this raises challenges of whether there is an available structure that supports such an arrangement and whether the needed logistics and incentives to run such a system exist? Political or governmental support is needed for both to run.

Equitable access to a universally covered eye care service is key to any strategy that aims to control health condition such as glaucoma for which the poor are usually worse affected as evidenced in the Ghana studies. The Ghana NHIS offers an opportunity to make such services available to Ghanaians. This is however challenged by non-inclusion of some WHO/ICO essential medicines for glaucoma care, and some investigations such as IOP measurement and visual field exams which are key in diagnosing and managing glaucoma. This creates a system where the equipment that was supplied to all the regional hospitals for diagnosing and managing glaucoma will further increase the gap in access between the lowest wealth and highest wealth quintiles. As shown in the conceptual framework, the effects of an absent universally covered eye care service crosscut all delivery levels with resultant catastrophic expenditure.

4.2 GLAUCOMA CARE IN GHANA

Even though Ghana presents quite a unique situation regarding the burden of glaucoma, it is using targets set for Sub Saharan Africa with regards to HReH. As to whether such targets will help tackle gaps in eye care is a question worth reflecting on but beyond this paper. What can however be said is that, among the methods used to set targets for human resource for health such as: population based, needs based, utilization based and effective demand based methods, the needs based assessment is the one that is being promoted by WHO as more responsive to actual gaps at the point of service delivery. Population based targets are used in the absence of needs based ones. WHO supported the GOG to conduct a Workload Indicator for Service Needs (WISN) assessment including eye care professionals in 2011. The targets presented by WISN analysis are all higher than the current targets as far as key health professional as concerned. An example of a probable set back with the current population based targets being used is that it estimates the needs for ON as 280 based on the country's population of about 28 million. Assuming all seven (7) tertiary hospitals, and 10 regional hospitals get the needed number of ONs, then how many will be left to fill the remaining 216 district hospitals and then the private and CHAG eye facilities will follow in demand for ONs. So already on paper some district hospitals will be without an ON. The figure proposed for ON by the WISN assessment is between an average of 1.5 and 4.5. This is critical because for a continue provision of eye service at the district level, each district should be targeting at least two ophthalmic nurses such that staff can enjoy their statutory leaves without affecting eye care service provision including glaucoma care in the districts.

The presence of laser surgeries at three centres in the country for glaucoma is an indication that the country is making steady strides regarding glaucoma, it however demonstrates the wide inequality that exist between those who do not even have access to certain key staff as indicated in the findings and these ones who have access to the latest technology as far as care is concerned.

4.3 UPPER EAST REGION

In terms of personnel and logistics the region is well prepared to respond to all referred cases of glaucoma suspects from the sub-districts and districts. This provides the required ethical and medical settings to screen for glaucoma in the region ^{61 62 63}. The oversight responsibility over the ON was an area of concern. This supervision of the ON is important because it provides the needed checks and balances to ensure quality care in such a task shifting system at the district level. It also provides avenue for mentoring.

In addition, the collaboration of the RHD and the regional ophthalmologist was observed to be non-existent. It is of concern since such collaboration is essential in better engaging and attracting donors in the eye sector and also ensuring that district health directorates and district hospitals provide the needed support to eye units in their respective districts.

4.4 TALENSI DISTRICT HOSPITAL

An interesting finding was the very good display of knowledge by the ON plus optimal practice as far as glaucoma care at the district level was concerned during the interview, and yet data from the facility HIMS indicated that there was no single suspected case of glaucoma for the 2017 half year. The questions this poses include are; whether the techniques employed were effective? Whether IOP measurements were actually being done as reported or whether the information transport system was efficient. The absence of an instrument to measure the CCT as well, will mean that people with thin corneas will have lower readings (false negatives).

The data from the various sub districts regarding eye care was worrisome since almost all eye conditions were captured as acute eye infection. This however the source of information for national health planning and priority setting. What this might lead to is further neglect of already neglected but important health conditions such as glaucoma

For efficient eye care provision, it is critical that eye care collaborate with other departments. This is however suffering some setbacks because of the lack of integration of eye care service at the district levels. This was demonstrated in the findings where some activities of the ON could not take place because of lack of support, and also by the wide knowledge gap that exist between the ON and other clinical staff in the Talensi District regarding glaucoma care, and the practice gap by the ON regarding glaucoma suspicion as captured by the Health Information Management System (HIMS) of the Talensi District.

Similarly, areas in the Talensi District could not benefit from the outreach services of the ON because of lack of support in terms of transport to get to those areas. This affects the awareness and knowledge of community level health staff as well as the community regarding glaucoma, which is key for a positive health seeking behaviour regarding glaucoma.

4.5 DATUKO SUB DISTRICT

At the sub district level, knowledge and practice is influenced principally by the ophthalmic nurse (ON) as far as eye conditions were concerned. The ON's inability to play this role well in the case of the Talensi Districts creates gaps in the practice and knowledge of the sub-district staff regarding eye conditions including glaucoma. The CHNs ignorance of glaucoma is mostly likely going to lead to a low community awareness and knowledge since they interact with households and the community the most. It is obvious from the conceptual frame work that, community knowledge and awareness including perceptions is ultimately the driver of any intervention to detect glaucoma patients early. This is why it is important for any intervention geared at control of glaucoma to seriously consider the role of the CHN.

A health practitioner that is usually not monitored is the traditional healer. Evidence from the results indicate that he is attending to people with eye conditions including suspected glaucoma cases. While it is relevant to engage them, the question is how best to engage them when actually their practices are not seen by the formal sector as being evidence based. One good option of engaging them will be to collaborate such that patients with all or certain eye conditions are referred to the hospital. The dilemma will be how to collaborate with the traditional healer without promoting their practice in the process. Or is it possible to question

the legality of their practice and use the law to stop them from seeing eye conditions in a setting such as Ghana?

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

After reviewing the findings and the discussions, the following conclusions can be made.

There is a global consensus on early detection of glaucoma as a strategy to control the high burden of irreversible blindness caused by glaucoma. However, what is contentious is the most appropriate method to use for different settings.

Global and National:

Glaucoma prevalence in Ghana is very high and seem to affect a significant portion of people below 40 years (not nationally proven though).

The targets for key eye care providers are lower than figures from a workload analysis done in the country in 2011. The current targets might still leave gaps in service delivery to all even if met.

There is a poor distribution of key eye care professionals in the country excluding the vulnerable from accessing glaucoma services.

Eye care is not adequately financed in Ghana and glaucoma care is not universally covered by the Ghana NHIS.

Regional and District:

There are essential logistics for glaucoma care in the UER of Ghana and at the Talensi District hospital in terms of personnel, equipment and medicines to support early detection and management of glaucoma. There is however no instrument to measure the central cornea thickness which affects Intra ocular pressure measurements.

No structured system to guide staff practice and knowledge sharing regarding glaucoma care in the Talensi District of Ghana.

Surveillance of glaucoma through the DHIMS2 is inadequate at the district level.

Knowledge of non-specialised primary level health workers in the Talensi District regarding glaucoma is limited and mixed with confusing believes and wrong information.

Traditional healers in the Talensi District treat eye conditions including glaucoma suspects without any adequate knowledge.

RECOMMENDATIONS

With the available global and local evidence regarding glaucoma, it is possible to improve systems to encourage reduction of the burden of irreversible blindness in the country. Some recommendations to do this are discussed briefly below.

GHS national should ensure equitable distribution of eye care professionals with skills and knowledge in glaucoma care in the country using the country's workload analysis targets. This is possible since the GHS is the employer of over 70% of eye care professionals in the country. Employment can be linked to areas lacking such personnel. Another strategy to achieve this recommendation will to grand study leaves for nurses in underserved areas to train and return to serve in those areas.

GHS headquarters should strengthen the Health information management system regarding eye conditions particularly glaucoma so as to ensure that, timely and accurate data on eye care in the country are always available to inform policy. Already the system is being strengthened in areas such as maternal and neonatal health. Key glaucoma indicators can therefore be included in it. ON at the district level should collaborate with the health information office (HIO) to ensure that sub districts' reports on eye conditions are accurate.

The National eye care unit with support from the GHS or NGOs, should develop very simple health education materials on glaucoma to be disseminated to health facilities in order to improve knowledge and perceptions regarding glaucoma among health workers in the district.

Ghana Health Service and the training institutions should collaborate to make measurement of central cornea thickness available and accessible at points where intra ocular pressures of patients are measured. This is critical because, the reliability of any measured intra-ocular pressure depends on the cornea thickness.

The RHD should collaborate with various DHDs and district hospitals in coming up with a regional policy on eye care outreaches to guide and harness support for the district outreach team to successfully embark on eye outreaches to sub districts. With this, dates can be fixed early so that good publicity is done before the outreach to increase its effectiveness and efficiency. The ON should travel together with the general outreach team so that, there is knowledge sharing in the process. Knowledge sharing with clinical staff at sub district level should be made an integral part of such an outreach policy in order to improve the knowledge base at the sub district level regarding glaucoma.

The regional health directorate should develop a policy that promotes opportunistic glaucoma screening of patients that present to eye units with other eye conditions. Also, there should be active identification and referral of people at high risk of developing glaucoma during home visits or at the clinics. Such high-risk persons include people who are blind in one eye already, or have a family member who are blind.

Guidelines should be developed for CHNs in the various districts to aid them in identifying and referring people with risk of glaucoma during home visit. Such guides can take the design of simple decision trees that is easy to use. Similar guides are being used by CHNs under the GHS new-born and maternal care program to identify mothers and new-borns with danger signs for onward referral to the health facilities. These can be used as guide in designing and implementing guidelines for identification of and referral of persons with high risk of glaucoma.

The regional ophthalmologist and the RHD should collaborate more to provide supervision and mentorship to District level staff regarding eye care particularly glaucoma

Every district hospital should have at least two ophthalmic nurses to ensure continuous provisions of eye care service including glaucoma care with no interruptions. This is feasible given that most district hospitals have an ophthalmic nurse already, and clinical nurses are willing to become ONs if granted study leaves. The fees for the program is paid by the student and so government will not need any extra fund in that regard. The only gap that will be created is the human resource deficit caused by the clinical nurse leaving for school. This deficit will however need to be assessed against the need or otherwise for an ophthalmic nurse.

At the regional and District level, there should strict enforcement of the MOH policy and guidelines on referrals to ensure adequate feedback is gotten for referrals on eye diseases at various levels in the region and district. The global change project implemented a referral system in the Bongo district of Ghana, where feedback of referrals from the district and regional hospitals were all sealed and deposited in letter boxes at the district health directorate. These were then delivered along site other letters to their respective sub districts. Such a system does not need any extra personnel or funds to implement, since it makes use of the already existing structures for health delivery.

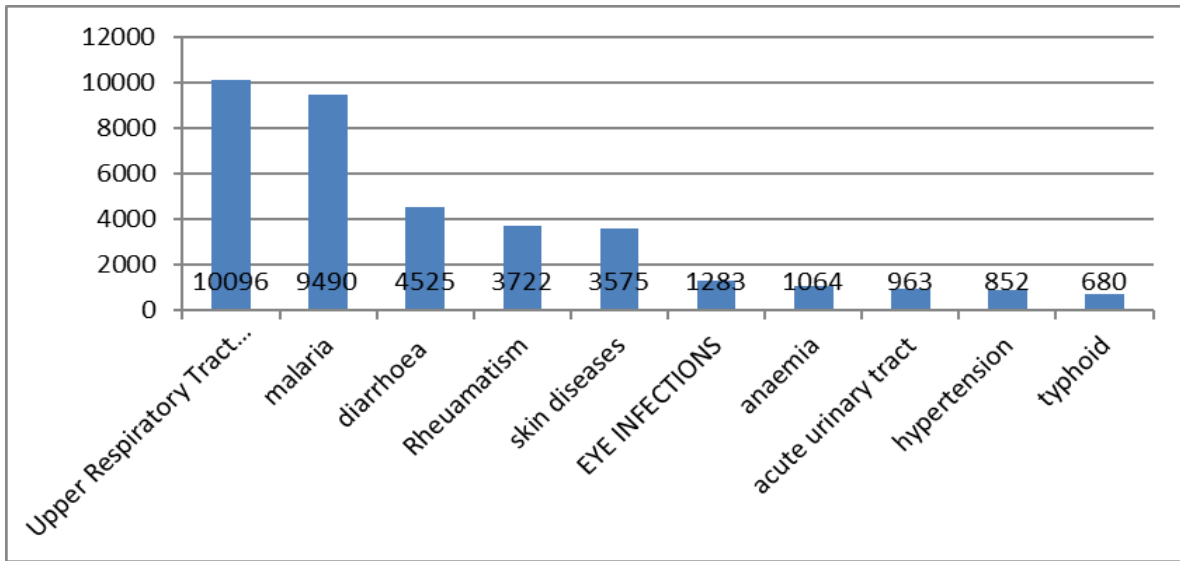
At the district level, the ON should collaborate with the health promotion units to come out with very simple messages on glaucoma to be used at radio stations for health promotion. There are a number of radio stations in the UER of Ghana who have free slots for health talks which can be utilized for this purpose.

For future research, there should be a population based survey in the Upper East Region regarding the prevalence and presentations of glaucoma. This is important because of trends being observed in the OPD in the UER that seem to suggest increasing detection of glaucoma in younger age groups in the Upper East Region of Ghana.

It is recommended that a low capital and simple interventional study, mostly making use of and/or strengthening current system, should be conducted at the District level in order to get the practical challenges and opportunities in the country for glaucoma detection and management.

ANNEX 1 FIGURES





ANNEX 2 TABLES

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NAME	LENGTH (Km)	SURFACE TYPE	CONDITION
Asongo-Pelungu-Sakoti	15.1	Earth	Poor
Sheage-Tindongo-Kpatia-Zuarungu	13	Gravel	Fair
Sheaga-Pelungu-Nangodi	15.7	Gravel/Earth	Fair
Tongo-Zuarungu	8.9	Gravel	Fair
Winkongo-Tongo-Sheaga	16.8	Gravel	Fair
Balungu Junction-Shia-Tongo Junction	8.7	Gravel	Poor
Sakoti Junction-Dutaku	19.5	Earth	Poor
Yinduri Junction-Yinduri	3.4	Earth	Poor
Balungu Junction-Balungu	6.4	Earth	Poor
Pwalugu-Arigu-Basigu	6.4	Earth	Poor
Sheaga-Datuku	9.9	Earth	Poor
Sheaga-Nungu	193.1	Earth	Poor
Tongo-Tenzuk	4.9	Earth	Poor
Kongo-Da Sabligo	4.5	Earth	Poor

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Disability Type	Both sexes		Male		Female	
	Number	percent	Number	percent	Number	percent
Total	81,194	100.0	40,831	100.0	40,363	100.0
No disability	76,963	94.8	38,816	95.1	38,147	94.5
With a disability	4,231	5.2	2,015	4.9	2,216	5.5
Sight	1,812	42.8	817	40.5	995	44.9
Hearing	943	22.3	358	17.8	585	26.4
Speech	591	14.0	318	15.8	273	12.3
Physical	797	18.8	403	20.0	394	17.8
Intellectual	457	10.8	221	0.5	236	0.6
Emotional	428	10.1	236	11.7	192	8.7
Other	291	6.9	118	5.9	173	7.8
Urban						
Total	12,918	100.0	6,484	100.0	6,434	100.0
No disability	12,372	95.8	6,212	95.8	6,160	95.7
With a disability	546	4.2	272	4.2	274	4.3
Sight	242	44.3	115	42.3	127	46.4
Hearing	103	18.9	48	17.6	55	20.1
Speech	43	7.9	26	9.6	17	6.2
Physical	144	26.4	77	28.3	67	24.5
Intellectual	34	6.2	15	0.2	19	0.3
Emotional	33	6.0	15	5.5	18	6.6
Other	91	16.7	36	13.2	55	20.1
Rural						
Total	68,276	100.0	34,347	100.0	33,929	100.0
No disability	64,591	94.6	32,604	94.9	31,987	94.3
With a disability	3,685	5.4	1,743	5.1	1,942	5.7
Sight	1,570	42.6	702	40.3	868	44.7

YEAR	2010		2011		2012		2013	
	No.	%	No.	%	No.	%	No.	%
INSURED	28161	65.8	41604	75.0	59352	82.2	66390	83.8
NON-INSURED	14614	34.2	13869	25.0	12844	17.8	12804	16.2
TOTAL	42775	100.0	55473	100.0	72196	100.0	79194	100.0

ANNEX 3 KIT APPROVAL LETTER



KIT | Health

Contact

Meta Willems
Telephone +31 (0)20 568 8514
m.willems@kit.nl

KIT Health | P.O. Box 95001, 1090 HA Amsterdam, The Netherlands

BY E-MAIL:
freezooloo@yahoo.co.uk

Our reference KIT Health

Amsterdam, 15 May 2017

Subject Decision Research Ethics Committee on Proposal S78

Dear Freeman,

The Research Ethics Committee of the Royal Tropical Institute (REC) has reviewed the proposal entitled "Exploring the knowledge, perceptions and practice of primary level health workers in Talensi District of the upper east region of Ghana regarding Glaucoma"

The decision of the Committee is as follows:

The Committee has reviewed the revised protocol and has taken note of your changes and clarification, and is pleased to see that you have addressed our concerns and questions to our full satisfaction.

The Committee is of the opinion that the proposal meets the required ethical standards for research and herewith grants you ethical approval to implement the study as planned in the afore mentioned protocol.

Kind regards,

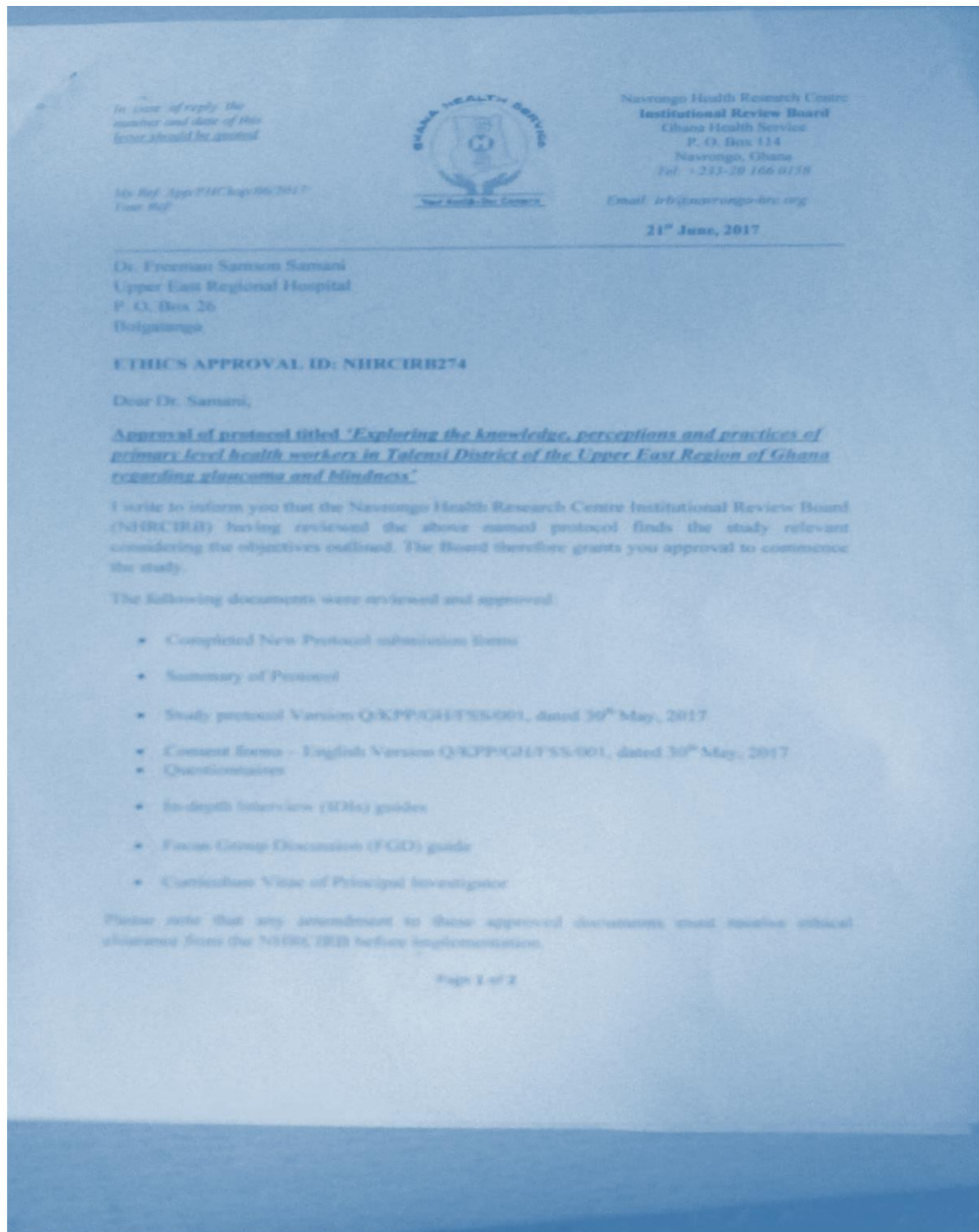
P. Baatsen,
Chair Research Ethics Committee, KIT

Mauritskade 63
1092 AD Amsterdam
P.O. Box 95001
1090 HA Amsterdam
The Netherlands
www.kit.nl/health
KVK 33185213
ABN AMRO NL40 ABNA 0570 0880 46
ABN AMRO USD NL46 ABNA 0570 1267 38

Royal Tropical Institute

ANNEX 4 NHRC APPROVAL

Check next page for letter please.



The Board would expect a report on your study, annually or at the close of same, whichever comes first. Should you require a renewal of your approval, a progress report should be submitted two (2) months before the expiration date.

The approval expires on **20th June, 2018.**

The Board wishes you all the best in the study.

Sincerely,



Dr. Kofi Inah
(Board Chair, NHRC IRB)

Cc: The Director
NHRC, Navrongo

ANNEX 5 RESEARCH PROTOCOL

EXPLORING THE KNOWLEDGE, PERCEPTIONS AND PRACTICES OF PRIMARY LEVEL HEALTH WORKERS IN THE TALENSI DISTRICT OF THE UPPER EAST REGION (UER) OF GHANA REGARDING PRIMARY OPEN ANGLE GLAUCOMA

Executive summary

Blindness is a very important public health disease with varied consequences on the patient and his/her family and far reaching effects on a nation as a whole. It is estimated globally that the direct cost of blindness is 25 billion dollars annually with this figure likely to double or triple if indirect cost is included. Primary open angle glaucoma (POAG) is the leading cause of irreversible blindness globally with 8% of the world blindness due to it. It is estimated that over 57 million people are living with POAG globally with 8.4 million being blind

The prevalence of blindness in Africa is 1%. Ghana has a high burden of glaucoma with over 600,000 people estimated to be living with it. Of these, over 30,000 are blind. POAG contributes 20.6% to the burden of blindness in Ghana, a proportion much higher than the contribution of glaucoma to global burden of blindness

The Ghana health service is organized at three levels nationally. The tertiary level consists of specialist doctors and other staff in teaching hospitals that cater for specialist referrals from the region and district hospitals. The regional hospitals form the secondary level and consist mainly of general practitioners and limited number of specialist doctors. The third level is the primary level made up of a district hospital and various health centres. District hospitals are referred to as primary level C. The sub district of which the health centre is part of is referred to as primary level B and the community/household level as primary level A. The primary level consists mainly of physician assistants, nurses and doctors. Primary level A and B health workers are closest to the community; interact closely with them and usually the first points of call when people in the community are unwell. They are also involved in health promotion on predetermined topics as part of their work. In Ghana most health interventions are being decentralized to the primary levels A and B in line with the Community Based Health Planning and Services (CHPS) model of GHS. The practice of the traditional healer is enshrined in traditions passed on from generations. Their practice is therefore not formal and not well regulated by the Traditional and Alternative Medicine Council. There is usually not clear linkage or collaboration with the formal sector. The Kwame Nkrumah University of Science and Technology (KNUST) now produce traditional health practitioners as part of efforts to formalize and regulate the sector

Timolol eye drop, a commonly prescribed medicine to control the raised intraocular pressure (IOP) is available at the district hospital level and covered by the NHIS. Latanoprost eye drop, recommended by the international council of ophthalmology as essential even for low resource settings and included as part of WHO list of essential medicines is not covered by the NHIS and therefore not accessible at the primary level of care

The purpose of this study is to explore the knowledge, perceptions and practices of health care providers at the primary level in the Talensi District of the UER of Ghana regarding POAG, and make recommendations to the managers of health at the community, district, regional and national levels towards improved detection and management of POAG.

The study will primarily be an explorative qualitative study making use of Focused group discussions (FGDs), In-depth Interviews (IDIs), vignette and observations. A desk study will also be carried out to identify common eye problems in the Talensi District, In-Service Training (IST) for staff and level of inclusion of eye conditions in the current basic curriculum for the training of Community Health Nurses (CHNs) and clinical nurses in Ghana.

Key words: Knowledge/Perceptions/Practices, Primary, Health, Glaucoma, Ghana

INTRODUCTION

STRUCTURE OF HEALTH DELIVERY SYSTEM IN GHANA.

The Ministry of Health (MOH) is the overall governing body for the health sector in Ghana. It is headed technically by the director of the ministry who is answerable to the minister of health. The MOH provides governance, resources, and monitors and evaluates all players in the health sector. It has implementing agencies within public, private and traditional practice settings. The implementing agencies within the public sector include Ghana health service (GHS), teaching hospitals and quasi government agencies. The private sector is made up mainly of the faith based facilities and the private for profit facilities. The practice of the Traditional Healer (TH) is enshrined in traditions passed on from generations. Their practice is not formal and therefore not well regulated by the Traditional and Alternative Medicine Council. There is usually not clear linkage or collaboration with the formal sector. The Kwame Nkrumah University of Science and Technology (KNUST) now produce traditional health practitioners as part of efforts to formalize and regulate the sector. The GHS is the biggest implementing agency within the public sector. Administratively, GHS is organized into the national, regional, district and sub district levels with the last two forming the primary level

Functionally, the health delivery system in Ghana is organized at three levels. The tertiary level consists of specialist doctors and other staff in teaching hospitals that cater for specialist referrals from the various regions. The regional hospitals form the secondary level and consist mainly of general practitioners and limited number of specialist doctors catering for referrals from the districts. The primary level is made up of a district hospital, health centres and community-based health planning and service (CHPS) compounds. At the primary level, the district hospital is referred to as primary level C. The sub district of which the health centre is part of is referred to as primary level B and the CHPS compound and community/household level as primary level A. Health workers at the primary level C consist mainly of physician assistants (PAs), nurses and very few medical doctors. Primary level B Health workers consist of PAs and clinical nurses (CNs). Primary level A Health workers consist mainly of community health nurses (CHNs). The district hospital usually serves an average population of between 100,000 and 200,000 people. It is also the first formal referral facility for patients seen at primary levels A and B. Each primary level B facility serve an estimated average population of about 20,000 and are the first point of contact for the community accessing the formal health delivery system. Primary level health workers (PLHW) are closest to the community and interact closely with them. They are also usually involved in health promotion at the facility level and homes on predetermined topics as part of their work. In Ghana most national interventions are being decentralized to primary levels A and B in line with the CHPS model of GHS.

GLAUCOMA

Blindness is defined by the World Health Organisation (WHO) as visual acuity of less than 3/60 in the better eye or a visual field of less than 10 degrees. This can be caused by problems with structures in the path of vision. These structures include; the cornea, the lens, the retina, the optic nerve and the part of the brain responsible for sight. For normal vision, light travels from a source outside the eye through the front transparent cornea, the lens and lands on the retina which is located at the back of the eyeball. The optic nerve which connects the retina to the brain transmits the light signals to brain. The brain then interprets the signal as an image. A fluid in the eye, the aqueous humor is produced to maintain the shape and function of the eye. This fluid is continuously drained via the trabecular meshwork to maintain the intraocular pressure (IOP) within certain physiological normal limits. An IOP of 12 -22 mmHg is estimated to be within physiological normalcy for most adults in the general population [1].

Glaucoma is a disease that damages the optic nerve. It is thought to be caused by an increase in the IOP of the eye. This is mostly from decrease outflow of fluid from poor drainage at the trabecular meshwork or closed drainage angle. This increase IOP causes damage to the optic disc (part of optic nerve visualized on examination of the eye) leading to a damage described as cupping. This causes blind spots in a person's vision. Usually peripheral fields are affected first with central vision well preserved till sight is completely lost. This is why glaucoma is mostly without any early symptom only for the patient to be confronted with an advanced disease [12].

Glaucoma is generally thought to always be associated with high IOP, however in normal tension glaucoma the IOP is usually below 22mmHg while evident of optic nerve damage occurs. Glaucoma is referred to as primary glaucoma when it is not due to any underlying medical condition or secondary glaucoma when it is due to an underlying medical condition. It is referred to as closed angle glaucoma when the drainage angle is closed and open angle glaucoma when the drainage angle is opened. Primary open angle glaucoma (POAG) is the commonest presenting form of glaucoma in Ghana and for this study I would be focusing on it

Risk factors for the development of glaucoma include; age greater than 40 years, family history of glaucoma, African or Hispanic heritage, short sightedness, history of onchocerciasis and chronic use of steroid based eye medications .

Some basic examination that can be done at the primary level regarding glaucoma detection are shown in table 1.

Examination	Instrument
Visual acuity test	Snellen chart
Pupillary light reflex	Pen torch
Tonometry	Tonometer
Fundoscopy	Ophthalmoscope
Visual field exams	Perimetry

Table 1: Instrument for the Assessment Of Glaucoma Patients at The Primary Level

The aim of treatment is to prevent or slow further damage of the optic nerve. Treatment modality for glaucoma is patient specific and guided by the severity of the disease and the patient's response to treatment. The cost of being on lifelong medications, unavailability of drugs and no subjective improvement while on medications adversely affect compliance to treatment. For patients with one eye blind from glaucoma and/or IOP moderately high (>28mmHg), surgery is the preferred mode of treatment **Error! Bookmark not defined..** This however depends on the availability of resources to operate glaucomatous eyes. Surgical treatment can be expensive and dependent on skill of performing ophthalmologist. Newer and less invasive techniques are now available but not accessible to most people in developing countries including Ghana. The aim is to detect the condition early and start appropriate management early so as to delay progression to blindness or prevent blindness altogether .

PROBLEM STATEMENT AND JUSTIFICATION

Main Objective

To explore the knowledge, perceptions and practices regarding glaucoma among primary level health workers in the Talensi District of Ghana, in order to make recommendations towards improved case detection of glaucoma in the health set up and to contribute to reducing the burden of irreversible blindness caused by glaucoma in the Talensi District, Ghana.

Specific objective

6. *To identify common eye problems in the Talensi District from 2010 – 2015, identify in-service trainings in eye conditions and level of inclusion of eye conditions in the current basic curriculum for the training of Community Health Nurses, Registered General Nurses, Physician Assistants and Ophthalmic Nurses in Ghana regarding eye conditions especially glaucoma.*

7. *To explore the knowledge of different health workers at the primary level regarding glaucoma in the Talensi District in UER of Ghana.*

8. *To explore perceptions and practices of primary level health workers in the Talensi District of Ghana towards patients presenting to health facilities with risk factors of glaucoma*

9. *To explore individual staff factors, health service and other factors that influence perceptions and practice of primary level health workers regarding glaucoma in the Talensi District of Ghana*

10. *Make recommendations aimed at bridging any identified gaps in the knowledge, perceptions and practice of primary level health workers in the Talensi District*

regarding glaucoma to the District Health Management Team, Regional Health Management Team, the Eye Secretariat, Nurses Training Institutions and other relevant bodies involved in eye care in Ghana, in order to contribute to early detection and management of glaucoma in the Talensi District, UER and Ghana as a whole.

METHODOLOGY

STUDY TYPE

Explorative qualitative study to allow for wide exploration of knowledge, perceptions and practices during focus group discussions (FGDs) as well as allow for deep and more in-depth exploration of same during In-Depth Interviews (IDIs). A desk study will also be conducted to provide current situation as far as eye conditions in the Talensi District are concerned. It will also give an idea of the place of glaucoma suspicion / diagnosis in relation to eye morbidities in the UER. Information will also be collected from curriculum of training institutions that train staff at the primary level of healthcare.

STUDY AREA

The Talensi District lies between latitude 10' 15" and 10' 60" north of the equator and longitude 0' 31" and 1' 0.5" west of the Greenwich meridian. It has a total land area of about 838.4 km². Farming practices and mining activities are a source of extensive environment degradation. It has a tropical climate with two distinct seasons, a wet rainy season, which is erratic, and runs from May to October, and a long dry season that stretches from October to April with hardly any rains. It has 96 towns and villages with a settlement pattern which is predominantly rural **Error! Bookmark not defined..**

In terms of employment, the informal sector dominates engaging about 90.7% of the labour force predominantly in farming. Majority of houses in the district are organized in a compound form that contain many households. The Talensi District has been divided into eight administrative sub-districts namely; Datoku, Duusi, Gbane, Gorogo, Tengzuk, Pwalugu, Namolgo-Kpatia, Tongo, Tolla-Nungu and Winkongo sub-districts. 83.8% of the patients who attend health facilities in the TD use the NHIS.

As at 2010, there were 4,231 persons with disability in the district representing 5.2% with more females (5.5%) being disabled compared to males (4.9%). 42% of the disable are as a result of blindness with more females being affected

STUDY POPULATION

This study will involve CNs, CHNs, ophthalmic nurses (ONs), optometrist, PAs and THs in the Talensi District as primary respondents. Same cadre of PLHWs who work within Datuko area would form the sub district population. A representative of the Talensi District Health Management Team (DHMT) and the regional ophthalmologist will be interviewed as key informants.

SAMPLING AND RECRUITMENT

FGDs – Four will be held; one each for CNs and CHNs at primary level C. Two others will be done for CNs and CHNs at Datuku Sub-District (DSD). These two categories of health staff form the majority of staff at the primary level. To reduce the bias that could arise from the effect of power difference, separate FGDs will be organised for CNs and CHNs respectively. Each FGD will be made of 8 participants of which efforts will be made to include 5 females and 3 males to reflect the higher number of females among CNs and CHNs.

IDIs – fourteen IDIs will be held for primary respondents; twelve will be purposively selected primary respondents while two (2) will be key informants. Key informant will include a representative of the Talensi DHMT and the regional ophthalmologist of the Presby Regional Eye Centre (PREC) in the UER (See Table 2 below).

Category	Number from district	Number from Sub district
Clinical nurses	1	1
Community health nurses	1	1
Physician Assistants	2	1
Ophthalmic nurses	1	0
Optometrist	1	0
Traditional healers	1	1
Health promotion officer	1	
Key Informants		
Ophthalmologist	1	
Representative of Talensi DHMT	1	
TOTAL	10	4

Table 2: Summary of participants for IDIs

Observation – Observation will be focused on the health system structures available for diagnosis and management of eye conditions at the primary and secondary level facilities in the region. Facilities will be observed for available protocols for managing common causes of blindness such as cataract and glaucoma. Consulting rooms will be checked for reference books available for eye conditions. At the pharmacy, medicines available for managing eye conditions particularly glaucoma will be verified. Prescription patterns as far as managing eye conditions including use of steroids will be checked. The theatre will also be observed for equipment available for eye surgeries and the registered eye surgeries done in the past three months.

For recruitment, Primary respondents : The purpose of the study will be explained to the Upper East Regional Director of Health Service (RDHS) from whom permission will be sought to include staff of the service in the study. With the help of the Talensi District Director of Health Service (DDHS), a nurse will be identified and trained on the study

protocol to help with consenting and recruitment of participants at primary levels A,B and C.

With the help of the district public health nurse and traditional leaders in the community, THs will be approached and recruited to take part in the study.

Key informants such as the Ophthalmologist in the region and a representative of the Talensi DHMT will be approached at their various work places to be recruited to take part in the study.

For observatory studies, the management of Talensi District Hospital (TDH), Bolga Regional Hospital and PREC will be approached at their places of work for permission to undertake study in their various institutions.

Inclusion criteria for primary respondents will be the various categories of staff mentioned including THs who are present and working in the district for at least 6 months.

Exclusion criteria will be staff who have been working in district for less than 6 months or who do not fit in any of the categories mentioned above. Health workers less than 18 years will be excluded from the study.

DATA COLLECTION

A desk study will be conducted in addition to FGDs, IDIs and observations mentioned above. Four (4) research assistants (RA) will be recruited to help with the study. The RAs will be mainly involved in note taking and transcription of data. Details of the data collection are described further below.

FOCUS GROUP DISCUSSIONS (FGD)

Number and composition for FGDs are described earlier. FGDs will be moderated by the principal Investigator (PI) using topic guides while RAs take notes with audio recording of discussion also taking place.

IN-DEPTH INTERVIEWS

Number and composition of participants for IDIs are mentioned earlier. Each IDI will be held using interview guide with primary respondents outside the FGD but who meet the inclusion criteria. An interview will take less than 1 hour, 30 minutes.

DATA PROCESSING AND DATA ANALYSIS

Guided by the grounded theory, there will be a continuous iteration between analysis and data collection in order to attain a good ground of themes and ideas. The analysis will start on the first day of data collection and continue throughout the process of data collection. Themes in topic guides and emerging themes during discussions and interviews will be used to code collected data. Data will then be summarized and synthesized under the various developed codes. Personal characteristics will be mapped with coded themes to identify

useful patterns that can enrich the process of analysis and narration. Particular interest will be given to quotable quotes that reflect better participants' views during the narration. Data collected by different methods will be triangulated to increase validity. Colleagues will peer-review the process during data collection and analysis to increase validity. At least weekly updates will be sent to supervisors for review.

ETHICAL CONSIDERATIONS

The completed proposal together with consent forms and other tools would be submitted to KIT ethic review committee for clearance. Once clearance is given, the same would be submitted to the Navrongo Health Research Center's Ethic Review Board for review and clearance.

Participants would be fully informed of study including issues bothering confidentiality, freedom to refuse to take part in study, freedom to leave study at any time, freedom to refuse to respond to some questions, issues on incentive and benefits of study amongst other issues as contained in the consent form. Confidentiality and anonymity will be maintained for IDIs and observations. It would be made clear that while every effort would be made to ensure confidentiality and anonymity during FGDs, it cannot be guaranteed for FGDs since other participants are involved. Participants will be discouraged from sharing personal examples that they wish to remain confidential.

Venues for FGDs and interviews would be places that participants prefer and feel secure about.

All data from study would be properly secured with complete destruction by the 31st March, 2018.

QUALITY ASSURANCE

All FGDs and IDIs will be moderated or facilitated by the principal investigator. Four research assistants will be hired to assist with note taking, audio recording and transcription of data from the field. The training of research assistants will be as practical and thorough as possible with a lot of role plays and simulations to ensure all of them get all that is needed for a successful and uniform study process. Areas of particular interest during this training will include data collection techniques to be employed in study including moderating FGDs, conducting interviews, critical observation, proper note taking and transcription of collected data. Tools to be used will be pre tested in a neighbouring or similar setting. There will be daily meetings of the research team to do summaries so that issues that will arise will be explored in subsequent field visits. Interviews and FGDs will be carried out in English as health workers all speak English. The interview with the traditional healer will however be in one of the local languages spoken in the area, so care will be taken to include a research assistant who speaks the two languages spoken in the area. During data collection, anything said in the local dialect will be translated to English by the facilitator or moderator for a common understanding of what is being said before it is written. There will be triangulation of data collected via different methods and respondents to increase validity. Emerging topics and themes will be continuously explored till saturation is reached at which

time no new theme or idea arises. Grounded theory will guide quality of data collection and analysis. In line with this, analysis will start from the first day of data collection and issues from analysis will influence subsequent data collection with issues from data collection also influencing analysis.

DISSEMINATION OF RESULTS

Final report and findings will be initially presented to the Royal Tropical Institute as part of the requirement in completing the MPH/ICDH program. Findings in the form of thesis will also be shared with examiners including external ones. Findings will be shared with participants through the Upper East RDHS and the Talensi DHMT. The Eye Secretariat and other bodies involved in eye care will be presented with findings. It will also be made accessible to individuals or bodies who might need it through publication in commonly accessed online journals.

LIMITATION

The number of physician assistants are few at the district level and so when a FGD is conducted for them, it will be difficult to get different physician assistants for the in-depth interviews. To manage this FGDs will be carried out only among nurses.

The time for the collection of data is short, which will mean research team will work into the evenings on a daily basis which can lead to fatigue and low quality of work. To manage this, each member of the team will have one day to rest per week. A doctor will also be contacted before start of work to provide psychological support for those who might need it.

Because completion of study report will be achieved in the Netherlands, the findings will be made available to KIT before the study participants and local authority. Findings will also be shared with examiners.

ANNEX 6 PARTICIPANTS CONSENT FORM (IDI) for PRIMARY RESPONDENTS AND KEY INFORMANTS

Good morning/afternoon/evening. My name is Freeman Samson Samani, a student from the Royal Tropical Institute (KIT) in Amsterdam. I am conducting a study on the knowledge, perceptions and practices of primary level health workers in Talensi District of the UER of Ghana regarding glaucoma. The purpose of the study is to explore the knowledge, perceptions and practices of primary level health workers of the Talensi District regarding detection and management of glaucoma. I will also want to know available facilities at the primary and at the regional level that supports diagnosis and management of such patients. Based on the findings, I will make recommendations towards improved case detection of glaucoma in the Talensi District, UER and Ghana as a whole.

As part of the interview, I will like to understand what the primary level health worker knows about glaucoma, hear your perceptions regarding same and identify what is done at primary level regarding glaucoma. I will also want to know factors that influence perceptions

ANNEX 7 PARTICIPANTS CONSENT FORM (FGD) WITH PRIMARY RESPONDENTS

Good morning/afternoon/evening. My name is Freeman Samson Samani, a student from the Royal Tropical Institute (KIT) in Amsterdam. I am conducting a study on the knowledge, perceptions and practices of primary level health workers in Talensi District of the UER of Ghana regarding glaucoma. The purpose of the study is to explore the knowledge, perceptions and practices of primary level health workers of the Talensi District regarding detection of glaucoma and management. We will also want to know available facilities at the primary level and at the regional level that supports diagnosis and management of such patients. Based on the findings, we will make recommendations towards improved case detection and management of glaucoma in the Talensi District, UER and Ghana.

As part of the interview, I will like to understand what primary level health workers know about glaucoma, hear your perceptions regarding same and identify what is done at the primary level regarding glaucoma. I will also want to know factors that influence perceptions and practices regarding glaucoma at the primary level. A colleague would join us for the purpose of note taking and tape recording so that we can concentrate on the conversation while ensuring no information is lost.

There is no immediate or direct benefit to you as a participant of this study, however, recommendations from this study could lead to interventions geared towards increasing early case detection and management of glaucoma in the region. You can be assured that every information provided will be handled confidentially and anonymously by the research team. While every effort will also be made to encourage other participants to keep information provided during discussion confidential, it cannot be guaranteed that every information provided will remain confidential. You are therefore urged not to share personal experiences that you would want to remain confidential. Findings would be cross checked with you to ensure they represent your ideas before the final report is produced.

You are free to choose to take part or not take part in the interview without any consequence to you. You can chose not to answer any question you are not comfortable with during the interview. You are free to end the interview at any point when you are not comfortable.

All files, electronic and otherwise, containing information you provide will be stored securely with only the Principal investigator having access to it. Same will be destroyed by 31st March, 2018. The interview would not exceed one (1) hour, thirty (30) minutes. You are free to ask any question now or interrupt at any time to ask a question for more clarification.

Thank you.

Please will you like to take part in the study? Yes/No

.....
Name of interviewee	Signature	Date
.....
Name of interviewer	Signature	Date

Contact details:

Principal Investigator:

Freeman Samson Samani

+233509252235

freezooloo@yahoo.co.uk

ANNEX 8 PARTICIPANTS CONSENT FORM FOR OBSERVATION

Good morning/afternoon/evening. My name is Freeman Samson Samani, a student from the Royal Tropical Institute (KIT) in Amsterdam. I am conducting a study on the knowledge, perceptions and practices of primary level health workers in Talensi District of the UER upper east region of Ghana regarding glaucoma. The purpose of the study is to explore the knowledge, perceptions and practice of primary level health workers of the Talensi district regarding detection of glaucoma. I am doing the observation here because you receive referrals from the primary respondents of my study (formal and informal health practitioners who see eye conditions in the Talensi District). Based on the findings, I will make recommendations towards improved case detection of glaucoma in the Talensi District.

As part of study, I will like to look at the facilities available here that supports provision of the needed service to patients with potentially blinding eye conditions particularly glaucoma. The departments that I will be visiting include the outpatient department, consulting rooms, health information office, pharmacy / dispensary and theatre/procedure rooms. Most part of the observation would be by way visual inspection with a few questions for clarification.

There is no immediate or direct benefit to the facility as a participant of this study. Recommendations from this study can lead to interventions geared towards increasing early case detection and management of glaucoma in the Talensi district and beyond. You can be assured that every information provided will be handled confidentially and anonymously. Findings will be cross checked with you to ensure they represent what is in place in the facility.

You are free to choose not to take part without any consequence to you. You are also free to end the observation at any point when you are not comfortable. All files, electronic and otherwise, containing information you provide will be stored securely with only the Principal investigator having access to them. Same will be destroyed by 31st March, 2018. The observatory study will not exceed one (1) hour, thirty (30) minutes. You are free to ask any question now or interrupt at any time to ask any question for more clarification.

Thank you.

Please would you like to take part in the observatory study? Yes/No

ADDRESS	BOX 147, BOLGATANGA, GHANA
NAME OF MOTHER	LUCY DABUO
PROFESSION	RETIRED NURSE
ADDRESS	BOX 147, BOLGATANGA, GHANA
NAME OF WIFE	MABEL SUMA-AMINENG FAANYE
PROFESSION	MIDWIFE
ACADEMIC QUALIFICATION	
2014	CERTIFICATE IN HEALTH ADMINISTRATION AND MANAGEMENT
2010	MB. ,ChB
2001	SSSCE (SENIOR SECONDARY CERTIFICATE EXAMINATION)
2008	BECE (BASIC EDUCATION CERTIFICATE EXAMINATION)
PROFESSIONAL EXPERIENCE	
SEPTEMBER 2016 TO DATE	MPH / ICDH STUDENT, ROYAL TROPICAL INSTITUTE , KIT, AMSTERDAM
MAY 2014 TO FEBRUARY 2016	PHYSICIAN SUPERINTENDENT , WAR MEMORIAL HOSPITAL, NAVRONGO
MAY 2014 TO FEBRUARY 2016	MEMBER, NAVRONGO HEALTH RESEARCH CENTRE INSTITUTIONAL REVIEW BOARD
JULY 2012 TO MAY 2014	PHYSICIAN OFFICER, UPPER EAST REGIONAL HOSPITAL, BOLGATANGA
MAY 2010 TO JUNE 2012	HOUSE OFFICER IN THE DEPARTMENTS OF SURGERY, CHILD HEALTH, OBSTETRICS AND GYNECOLOGY AND INTERNAL MEDICINE AT KORLE BU TEACHING HOSPITAL, UPPER EAST REGIONAL HOSPITAL AND BRONG AHAFO REGIONAL HOSPITAL RESPECTIVELY.
2012 TO 2016	FACILITATOR GHS REGIONAL IN SERVICE TRAINING UNIT, BOLGATANGA

2013	TEAM LEADER, 2013 MATERNAL AUDIT RECOMMENDATION DISSEMINATION TEAM, UPPER EAST REGION
SPECIAL COURSES/CONFERENCES	
JULY 2014 TO AUGUST 2014	HEALTH SERVICE ADMINISTRATION AND MANAGEMENT AT GHANA INSTITUTE OF MANAGEMENT AND PUBLIC ADMINISTRATION , LEGON
NOVEMBER 2008 TO DECEMBER 2008	IFMSA PHYSICIAN EXCHANGE PROGRAM IN THE DEPARTMENT OF OPHTHALMOLOGY, CHARLES UNIVERSITY, PRAGUE, REPUBLIC OF CZECH
PROFESSIONAL AFFILIATIONS	
2010 TO PRESENT	GHANA PHYSICIAN ASSOCIATION
2010 TO PRESENT	LICENSED BY GHANA PHYSICIAN AND DENTAL COUNCIL
SOCIAL SERVICE / COMMITTEES / LEADERSHIP	
2010 to 2014	Member of social service subcommittee, District health committee and mining subcommittee of the Talensi district assembly
2013	TEAM LEADER, 2013 MATERNAL AUDIT RECOMMENDATION DISSEMINATION TEAM, UPPER EAST REGION
2007-2008	STUDENT REPRESENTATIVE ON UNIVERSITY OF GHANA PHYSICIAN SCHOOL FINANCE AND DEVELOPMENT COMMITTEE, KORLE BU
2007 TO 2008	STUDENTS REPRESENTATIVE ON COLLAGE OF HEALTH SCIENCES TENDER BOARD, KORLE BU
2007 TO 2008	FINANCIAL SECRETARY, UNIVERSITY OF GHANA PHYSICIAN STUDENTS ASSOCIATION, KORLE BU.
HOBBIES	SPORTS, READING AND SOCIAL SERVICE

ANNEX 10 RESEARCH TABLE

Exploring current knowledge, perceptions and practices regarding glaucoma among primary level health workers in the Talensi District of Ghana, in order to make recommendations towards improved case detection of glaucoma in the health set up and to contribute to reducing the burden of irreversible blindness caused by glaucoma

Specific objectives	Issues	Sub issues	Methods	Respondents
<i>To identify common eye problems in the Talensi District from 2010 – 2015, identify in-service trainings in eye conditions and level of inclusion of eye conditions in the current basic curriculum for the training of Community Health Nurses, Registered General Nurses, Physician Assistants and Ophthalmic Nurses in Ghana</i>			Desk Study	Talensi District Health Directorate UE Regional Health Directorate Selected Health Training institutions
<i>Explore the knowledge of different health workers at the primary level regarding</i>	General Knowledge on blindness	Burden of blindness, causes of blindness in Ghana, available treatment for causes of blindness, relative burden of various causes	Focused group discussions	Clinical Nurses Community Health nurses
	Knowledge on Glaucoma	Signs and symptoms, how to diagnose, Blindness treatable or not, Risk factors	In-depth interview	Physician Assistants

<i>glaucoma in the Talensi district of the UER of Ghana.</i>		- family, myopia, age , African, Steroid use, onchocerciasis history DM? etc.	Vignette	Ophthalmic nurses Optometrist Traditional healers Health promotion officer
	Important history to get from patient	Family history? Age? Race? Steroid use? Symptoms? Symptom relation to blindness?		
	Examinations and investigations required	Visual acuity? Pupillary reflex? Type? IOP? Ophthalmoscope (vertical disc ratio), visual field examination?		
	Treatment	Physician? Surgical?		
	Follow up for patients with Glaucoma			
To explore perceptions and practices of primary level health workers in the Talensi District of Ghana towards patients presenting to health facilities with risk factors of glaucoma	Daily practice relative to eye care and Common treatment regimes	Commonly diagnosed conditions (red eye, etc.), frequency of referrals, destination of referrals, Health promotions on eye conditions? Frequency? Topics covered so far this year? Guidelines for the use of steroids	Focused group discussions	Clinical Nurses Community Health nurses Physician Assistants Ophthalmic nurses Optometrist Traditional healers Health promotion officer Ophthalmologist Representative of talensi district health management team
	Available protocols guiding practice in relation to eye care	Any reference book- Standard treatment guideline (STG), British national formulary (BNF), WHO guidelines etc. Facility protocols Others	In-depth interview	
	Treatment available in facility for people with glaucoma		Vignette	
	Follow up		observation	

To explore individual staff, health service and other factors that influence perceptions and practice of primary level health workers regarding glaucoma in the Talensi District of Ghana	Staff (individual) factors	Motivation (money, trainings, off days, etc.) Any Stress? (Patient load, working environment?)	Focused group discussions	Clinical Nurses Community Health nurses
	Health service factors	Motivation (money, promotion, off days, leave, etc.) Available facility protocols for managing eye conditions with emphasis on glaucoma (Basic equipment to work with (Pen touch, Snellen chart, Ophthalmoscope, Tonometer etc.) Cost of drugs and services (drugs – Timolol, Acetazolamide, xalatan, etc. surgery for glaucoma) Management support for eye care – outreach support, surgeries support Available drugs (antibiotic only, steroid only preparations, steroid antibiotic combined medicines,	In-depth interview Key informant interview Observation	Physician Assistants Ophthalmic nurses Optometrist Private care Providers Traditional healers Health promotion officer Ophthalmologist Representative of Talensi district health management team
	Other factors	What are the NGO supported activities geared towards glaucoma and blindness in the district What are the private facilities that provide eye care in the district		

		<p>What are the traditional healers providing eye care in the district</p> <p>What are your views on the activities of the above</p>		
<p><i>Make recommendations aimed at bridging any identified gaps in the knowledge, perceptions and practice of primary level health workers in the Talensi District regarding glaucoma to the District Health Management Team, Regional Health Management Team, the Eye Secretariat Nurses Training Institutions and other relevant bodies involved in eye care in Ghana, in order to contribute to early detection and management of glaucoma in the Talensi District, UER</i></p>				<p>Community</p> <p>DHD</p> <p>RHD</p> <p>GHS</p> <p>KIT</p>

<i>and Ghana as a whole</i>				
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ANNEX 11 INTERVIEW GUIDE FOR IDIS PRIMARY RESPONDENTS

1. Personal data	
1.1 Interview code	
1.2 Age in year	
1.3 What category of staff are you	<ul style="list-style-type: none"> <input type="radio"/> Ophthalmologist <input type="radio"/> Physician officer <input type="radio"/> Physician Assistant <input type="radio"/> Ophthalmic nurse <input type="radio"/> Registered general nurse <input type="radio"/> Enroll nurse <input type="radio"/> Community health nurse <input type="radio"/> Other specify
1.4 How long have you worked in above category	<ul style="list-style-type: none"> <input type="radio"/> 0 – 1 year

	<ul style="list-style-type: none"> ○ >1 – 5years ○ > 5 years
1.5 What are the primary things that you do routinely (can tick more than one)	<ul style="list-style-type: none"> ○ Health promotion in the facility only ○ Health promotion at homes only ○ Both ○ Consultation of clients ○ Consulting nurse (supports a prescriber to consult patients) ○ Other specify
2. To explore knowledge of different health workers at the primary level regarding glaucoma	
Issues	Sub issues
2.1 General knowledge on blindness	<ol style="list-style-type: none"> 1. What are your views of blindness in Ghana (wait on responses and probe along the following lines) – age affected, sex affected, high or low. 2. World sight day ? 3. What do you think are the leading causes of blindness in Ghana (please if you can, order them in terms of which causes more blindness)

	<p>4. What do you think can be done for some of the conditions mentioned above</p>
<p>2.2 Vignette</p>	<p>After each, pause for responses</p> <ol style="list-style-type: none"> 1. A 70 year old man walks to your consulting room and tells you he is not able to see with his left eye. He however cannot tell when it really occurred because he never felt any pain or unusual symptom, (what else would you like to know in the history that will make you to either suspect glaucoma or not) 2. He mentions that, His father who is deceased now was also blind in one and was put on eye medications for the other eye which he used for more than 3 years before passing on. How will this information likely influence your decision above and why? 3. You ask him whether he can see well with his right eye for which he said yes, but adds that for some strange reason he keeps on running into objects. You actually noticed that he hit his left leg on the chair while walking in, even though the chair was in an obvious position. What do you think is the likely reason why he is running into objects even though he said he is able to see with the right eye? 4. Which test will you like to do for this patient and why? 5. IOP is checked 30mmHg, what in your opinion is wrong with this man

	<p>6. At what level do you think this patient needs to be seen, please explain</p> <p>7. Patient comes a month later from a teaching hospital with a diagnosis of glaucoma. He now wants to know a number of things since the specialist who attended to him at the teaching hospital was too busy to answer his questions. (Please pause after each concern)</p> <ul style="list-style-type: none"> • how long it would take him to get cured of glaucoma • whether he would be able to regain his lost sight • and why he did not know he had a problem with his eye since the specialist mentioned he most likely had the condition for a while for it to have caused that level of damage. <p>What can he do for his siblings and family</p>
<p>2.3 Knowledge on Glaucoma</p>	<p>After each, pause for responses</p> <ol style="list-style-type: none"> 1. Do you think glaucoma in Ghana is a problem, why 2. What do you think are the signs and symptoms of glaucoma 3. How is the diagnosis of glaucoma made 4. Do you think glaucoma is treatable 5. Do you think glaucoma cause blindness

	<p>6. Is the blindness caused by glaucoma treatable (reversible)</p> <p>7. What do you think are some of the risk factors for developing glaucoma (wait for responses and probe around risk factors) - family history, age >40 years, being African, chronic Steroid use, previous infection with onchocerciasis, short sightedness</p>
<p>2.4 What are some things that should be looked out for in the history of a patient that would help you suspect or not suspect glaucoma</p>	<p>Wait for response then probe systematically using;</p> <ol style="list-style-type: none"> 1. Family history of Glaucoma 2. Gradual painless loss of sight in one eye 3. Age of patient 4. Race 5. chronic Steroid use 6. symptoms relating to blindness (for example running into objects) 7. other
<p>2.5 What examinations or investigations should be done to help pick suspects of glaucoma</p>	<p>Wait for response then probe systematically using;</p> <ol style="list-style-type: none"> 1. Visual acuity 2. Pupillary reflex ?type 3. Intraocular pressure (IOP)

	<ol style="list-style-type: none"> 4. Ophthalmoscopy (vertical cup/disk ratio) 5. Visual field examination (confrontation method)
<p>2.6 What in your view are the treatment options for patients diagnosed with glaucoma</p>	<p>Wait for response then probe systematically using;</p> <ol style="list-style-type: none"> 1. Physician treatment 2. What does it take the patient to do it (terms of cost, time, side effects etc.) 3. Surgical treatment 4. What does it take the patient to do it (terms of cost, time, side effects etc.) 5. Traditional treatment 6. What does it take the patient to do it (terms of cost, time, side effects etc.) 7. Other treatment 8. What does it take the patient to do it (terms of cost, time, side effects etc.) 9. What do you think is the preferable treatment for a patient with an established glaucoma (IOP > 28mmHg, with typical eye changes)

<p>2.7 How often and how long are glaucoma patients followed up on, what factors influence this</p>	
<p>3. Explore perceptions and practice of primary level health workers regarding glaucoma</p>	
<p>3.1 Daily practice relative to eye care and Common treatment regimes</p>	<ol style="list-style-type: none"> 1. What are some of the common eye diagnosis that are made for adults greater than 40 years in facility / district- (wait for responses and probe further using the following as guide) bacterial eye infections, viral eye infections, injuries/ trauma, cataract, glaucoma 2. What do you think is the difference between cataract and glaucoma and how are they referred to as in the community (probe along black blindness and white blindness, reversible blindness verses irreversible blindness etc) 3. Which eye conditions are commonly managed here 4. Which eye conditions are often referred 5. Where are the places that your referrals go to (talensi district hospital, bolga regional hospital, bawku presby hospital, tamale teaching hospital, etc) 6. How many Health promotion activities have been done for the month/year and how about how many were on eye conditions. This include (wait for responses and probe along the following conditions) cataract, glaucoma etc
<p>3.2 Guidelines and protocols</p>	<ol style="list-style-type: none"> 1. What are some the reference books that you have for diagnosing and managing eye conditions including glaucoma – Standard treatment guideline (STG), British national

	<p>formulary (BNF), GHS reference Book, WHO reference Book , etc</p> <p>2. What are the facility protocols for managing eye disease</p> <p>3. Are there facility guidelines on use of potentially harmful eye medications , please can give me examples, probe on steroid if it is not mentioned</p> <p>4. Other protocols</p>
3.3 Treatment available in facility for glaucoma	1. What treatment are available in this facility for management of glaucoma
3.4 How often and how long are glaucoma patients followed up on, what factors influence this	
4. Factors that influence perceptions and practice of primary level health workers regarding glaucoma and blindness	
4.1 Individual (staff) factors	<p>1. What do you think are some personal factors that will influence a primary health worker habit and practice regarding glaucoma – motivation, work load, other forms of stress etcetera</p> <p>2. What would you consider as important motivating factors for health workers working at the primary level particularly those involved in eye care – money, trainings , leave / off days,</p> <p>3. Wat do you think are sources of stress for health workers working at the primary level – patient numbers , working environment , patient compliance and response to treatment</p>

<p>4.2 Health service factors</p>	<ol style="list-style-type: none"> 1. What do you think are some of the things that the district provides primary level health workers as a form of motivation (wait for responses and probe along the following conditions) – money , recognition, recommendation, study leave , promotion 2. What are the available protocols for managing eye conditons particularly glaucoma – 3. What equipment are available for managing eye conditions particularly glaucoma, and where are these located (wait for responses and probe along the following conditions) – Snellen chart, ophthalmoscope, pen torch, visual field machine, etc. 4. Which drugs are available for eye conditions particularly glaucoma in the facility (wait for responses and probe along the following conditions) - antibiotics, steroids, analgesics , combinations, timolol, acetazolamide, xalatan, others 5. Are drugs covered by the NHIS 6. How much would it cost the patient to pay for diagnosis and management of glaucoma per month or per visit with an eye condition , please specify some examples, (probe about glaucoma if it is not mentioned) 7. What do you think are some of the ways facility managers in the district use in supporting or otherwise, eye care particularly glaucoma eg outreach sponsorship
<p>4.3 Others</p>	<ol style="list-style-type: none"> 1. What are the NGO supported activities geared towards glaucoma and blindness in the district 2. What are the private facilities that provide eye care in the district

	<p>3. What are the traditional healers providing eye care in the district</p> <p>4. What are your views on the activities of the above</p>
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ANNEX 12 INTERVIEW GUIDE FOR IDIS (KI) – REPRESENTATIVE OF TALENSI DISTRICT
HEALTH MANAGEMENT TEAM

1. Personal data	
1.1 Interview code	
1.2 Age in year	
1.3 What category of staff are you	<ul style="list-style-type: none"> <input type="radio"/> Ophthalmologist <input type="radio"/> Physician officer <input type="radio"/> Physician Assistant <input type="radio"/> Ophthalmic nurse <input type="radio"/> Registered general nurse <input type="radio"/> Enroll nurse <input type="radio"/> Community health nurse <input type="radio"/> Other specify

	<ul style="list-style-type: none"> ○
1.4 How long have you worked in above category	<ul style="list-style-type: none"> ○ 0 – 1 year ○ >1 – 5years ○ > 5 years
1.5 What are the primary things that are routinely done by primary level health workers in the district (can tick more than one)	<ul style="list-style-type: none"> ○ Health promotion in the facility only ○ Health promotion at homes only ○ Both ○ Consultation of clients ○ Consulting nurse (supports a prescriber to consult patients) ○ Other specify

2.Explore perceptions and practice of primary level health workers regarding glaucoma	
2.1 Daily practice relative to eye care and Common treatment regimes	<ol style="list-style-type: none"> 1. What are some of the common eye diagnosis that is made for adults greater than 40 years in facility / district presenting with visual impairment – bacterial eye infections, viral eye infections, injuries/ trauma, cataract, glaucoma

	<p>2. What are some of the common eye diagnosis that is made for adults greater than 40 years in facility / district presenting with visual impairment/blindness(wait for responses and probe along the following conditions) – bacterial eye infections, viral eye infections, injuries/ trauma, cataract, glaucoma</p> <p>3. Which eye conditions are managed here</p> <p>4. Which eye conditions are often referred</p> <p>5. Where are the places that your referrals go to (talensi district hospital, bolga regional hospital, bawku presby hospital, tamale teaching hospital, etc.?)</p> <p>6. How many Health promotion activities have been done for the month/year and how many were on eye conditions. This include (wait for responses and probe along the following conditions</p>
<p>2.2 Guidelines and protocols</p>	<p>1. What are some the reference books that you have for diagnosing and managing eye conditions including glaucoma – Standard treatment guideline (STG), British national</p>

	<p>formulary (BNF), GHS reference Book, WHO reference Book , etc.</p> <p>2. What are the facility protocols for managing eye disease</p> <p>3. Are there facility guidelines on use of potentially harmful eye medications , please can give me examples, probe on steroid if it is not mentioned</p> <p>4. Other protocols</p>
2.3 Treatment available in facility for glaucoma	<p>1. What treatment are available in the district for management of glaucoma</p>

3 Factors that influence habits and practice of primary level health workers regarding glaucoma	
3.1 Individual (staff) factors	<p>1. What do you think are some personal factors that will influence a primary health workers in your district (talensi) perceptions and practice regarding eye care – motivation, work load, other forms of stress etc.?</p> <p>2. What would you consider as important motivating factors for health workers working at the primary level particularly those involved in eye care – money, trainings , leave / off days,</p> <p>3. Wat do you think are sources of stress for health workers working at the primary level in the talensi district– patient numbers , working environment , patient compliance and response to treatment</p>

<p>3.2 Health service factors</p>	<ol style="list-style-type: none"> 1. What do you think are some of the things that the district should provide primary level health workers as a form of motivation (wait for responses and probe along the following conditions) –money , recognition, recommendation, study leave , promotion 2. What are some of the things that the district is providing primary level health workers as a form of motivation (wait for responses and probe along the following conditions) –money , recognition, recommendation, study leave , promotion 3. What are the available protocols for managing eye conditions particularly glaucoma – 4. What equipment are available for managing eye conditions particularly glaucoma, and where are these located (wait for responses and probe along the following conditions) – Snellen chart, ophthalmoscope, Tonometer, pen touch, visual field machine, genioscope, etc. 5. Which drugs are available for eye conditions particularly glaucoma in the facilities (wait for responses and probe along the following conditions) - antibiotics, steroids, analgesics , combinations, timolol, acetazolamide, xalatan, others 6. Are drugs covered by the NHIS 7. Do you know How much it would cost a patient to pay for diagnosis and management of eye conditions in the district per visit, examples (probe about glaucoma if it is not mentioned)

	8. What do you think are some of the ways facility managers in the district do to supporting eye care particularly glaucoma; examples- outreach sponsorship
3.3 Others	<ol style="list-style-type: none"> 1. What are the NGO supported activities geared towards glaucoma and blindness in the district 2. What are the private facilities that provide eye care in the district 3. What are the traditional healers providing eye care in the district 4. What are your views on the activities of the above

ANNEX 13 INTERVIEW GUIDE FOR IDIS (KI) EYE CENTER

1. Personal data	
1.1 Interview code	
1.2 Age in year	
1.3 What category of staff are you	<ul style="list-style-type: none"> ○ Ophthalmologist ○ Physician officer ○ Physician Assistant

	<ul style="list-style-type: none">○ Ophthalmic nurse○ Registered general nurse○ Enroll nurse○ Community health nurse○ Other specify○
1.4 How long have you worked in above category	<ul style="list-style-type: none">○ 0 – 1 year○ >1 – 5years○ > 5 years

2 Perceptions and practice of primary level health workers regarding glaucoma	
<p>2.1 Daily practice relative to eye care and Common treatment regimes</p>	<ol style="list-style-type: none"> 1. In your experience, What are some of the common eye diagnosis that are made for adults greater than 40 years in the region – bacterial eye infections, viral eye infections, injuries/ trauma, cataract, glaucoma 2. In your experience, What are some of the common eye diagnosis that are made for adults greater than 40 years in the region presenting with visual impairment – bacterial eye infections, viral eye infections, injuries/ trauma, cataract, glaucoma 3. Which eye conditions are managed here 4. Which eye conditions are often referred 5. Where are the places that your referrals go to
<p>2.2 Guidelines and protocols</p>	<ol style="list-style-type: none"> 1. In your experience, What are some the reference books that are used in the facilities of the region for diagnosing and managing eye conditions including glaucoma – Standard treatment guideline (STG), British national formulary (BNF), GHS reference Book, WHO reference Book , etc

	<p>2. In your experience, are there guidelines on use of potentially harmful eye medications such as steroids in most of the district facilities of the region</p>
<p>2.3 Treatment available in facility for glaucoma</p>	<p>1. What treatment are available in this facility (Presby eye center) for management of glaucoma</p>

<p>3 Factors that influence habits and practice of primary level health workers regarding glaucoma and blindness</p>	
<p>3.1 Individual (staff) factors</p>	<p>1. Wat do you think are sources of stress for health workers working at the primary level in the region – patient numbers , working environment , motivation, career progression , patient compliance and response to treatment</p>
<p>3.2 Health service factors</p>	<p>1. In your experience, What equipment are available for managing eye conditions particularly glaucoma, and where are these located (wait for responses and probe along the following conditions) – Snellen chart, ophthalmoscope, Tonometer, pen touch, visual field etc.</p> <p>2. Which drugs are available for eye conditions particularly glaucoma in the region (wait for responses and probe along the following conditions) - antibiotics, steroids, analgesics , combinations, timolol, acetazolamide, xalatan, others</p>

	<p>3. Are drugs covered by the NHIS</p> <p>4. In your experience, What are some of the ways facility managers in the region are supporting or otherwise, eye care particularly glaucoma example - outreach sponsorship</p>
3.3 Others	<p>1. What are the NGO supported activities geared towards glaucoma and blindness in the region</p> <p>2. What are the private facilities that provide eye care in the region</p> <p>3. What are the traditional healers providing eye care in the region</p> <p>4. What are your views on the activities of the above</p>

ANNEX 14 INTERVIEW GUIDE WITH FGDS FOR PRIMARY RESPONDENTS

Exploring knowledge, perceptions and practices regarding glaucoma among primary level health workers in the talensi district of Ghana, in order to make recommendations towards improved case detection of glaucoma in the health set up and to contribute to reducing the burden of irreversible blindness caused by glaucoma

1. Personal data (to be completed by each participant on a separate sheet)	
1.1 Interview code	
1.2 Age in years	

<p>1.3 What category of staff are you</p>	<ul style="list-style-type: none"> ○ Ophthalmologist ○ Physician officer ○ Physician Assistant ○ Ophthalmic nurse ○ Registered general nurse ○ Enrolled nurse ○ Community health nurse ○ Other specify
<p>1.4 How long have you worked in above category</p>	<ul style="list-style-type: none"> ○ 0 – 1 year ○ >1 – 5years ○ > 5 years
<p>1.5 What are the primary things that you do routinely (can tick more than one)</p>	<ul style="list-style-type: none"> ○ Health promotion in the facility only ○ Health promotion at homes only ○ Both ○ Consultation of clients ○ Consulting nurse (supports a prescriber to consult patients) ○ Other specify

<p>2. To explore the knowledge of different health workers at the primary level regarding glaucoma and blindness</p>	
<p>Issues</p>	<p>Sub issues</p>
<p>2.1 General knowledge on blindness</p>	<p>1. What are you views of blindness in Ghana (wait on responses and probe along the following lines) – age affected, sex affected, high or low.</p>

	<ol style="list-style-type: none"> 2. World sight day ? 3. What do you think are the leading causes of blindness in Ghana (please if you can, order them in terms of which causes more blindness) 4. What are treatment options available for some of the causes of blindness in Ghana
<p>2.2 Vignette</p>	<p>After each, pause for responses</p> <ol style="list-style-type: none"> 1. A 70 year old man walks to your consulting room and tells you he is not able to see with his left eye. He however cannot tell when it really occurred because he never felt any pain or unusual symptom, (what else would you like to know in the history that will make you to either suspect glaucoma or not) 2. He mentions that, His father who is deceased now was also blind in one and was put on eye medications for the other eye which he used for more than 3 years before passing on. (what further will you do) 3. You ask him whether he can see well with his right eye for which he said yes, but adds that for some strange reason he keeps on running into objects. You actually noticed that he hit his left leg on the chair while coming in even though chair was in an obvious position. (any further thoughts on what might be wrong with this man and why he is running into objects even though he thinks he can see well) 4. What do you think are the important examinations or tests that this man needs 5. IOP is checked and is found to be 30mmHg. (what do think could be happening) 6. At what level do you think this patient needs to be seen, please explain

	<p>7. Patient comes a month later from a teaching hospital with a diagnosis of glaucoma. He now wants to know a number of things since the specialist who attended to him at the teaching hospital was too busy to answer his questions. (Please pause after each concern)</p> <ul style="list-style-type: none"> • how long it would take him to get cured of glaucoma • whether he would be able to see normally again • and why he did not know he had a problem with his eye since the specialist mentioned he had it for a while for it to have caused that level of damage. • What can he do for his family
<p>2.3 Knowledge on Glaucoma</p>	<p>After each, pause for responses</p> <ol style="list-style-type: none"> 1. Do you think glaucoma in Ghana is a problem, why 2. What do you think are the signs and symptoms of glaucoma 3. How is the diagnosis of glaucoma made 4. Do you think glaucoma treatable 5. Do you think glaucoma cause blindness 6. Is the blindness caused by glaucoma treatable (reversible) 7. What do you think are some of the risk factors for developing glaucoma (wait for responses and probe around risk factors) – family history, age >40 years, being African, Steroid use, previous infection with onchocerciasis
<p>2.4 What are some things that should be looked out for in the history of a patient that would help you suspect or not suspect glaucoma</p>	<p>Wait for responses then probe along the following lines</p> <ol style="list-style-type: none"> 1. Family history of Glaucoma 2. Gradual onset of painless blindness in one or both eyes 3. Age of patient, 4. Race, 5. chronic Steroid use, 6. symptoms relating to blindness (running into objects) 7. other
<p>2.5 What examinations or investigations</p>	<p>Wait for response and then probe along the following lines</p>

<p>should be done to help pick suspects of glaucoma</p>	<ol style="list-style-type: none"> 1. Visual acuity 2. Pupillary reflex ?type 3. Intraocular pressure (IOP) 4. Ophthalmoscopy (vertical disc ratio) 5. Visual field examination
<p>2.6 What in your view are the treatment options for patients diagnosed with glaucoma</p>	<p>Wait for response and then probe along the following lines, encourage participants to give examples</p> <ol style="list-style-type: none"> 1. Physician treatment 2. What does it take the patient to do it (terms of cost, time, side effects etc.) 3. Surgical treatment 4. What does it take the patient take the patient to do it (terms of cost, time, side effects etc?) 5. Traditional treatment 6. What does it take the patient to do it (terms of cost, time, side effects etc?) 7. Other treatment 8. What does it take the patient to do it (terms of cost, time, side effects etc?) 9. What do you think is the preferable treatment for a patient with an established glaucoma (IOP > 28mmHg, with typical eye changes)

<p><i>3. Explore perceptions and practices of primary level health workers regarding glaucoma</i></p>	
<p><i>3.1 Daily practice relative to eye care and Common treatment regimes</i></p>	<ol style="list-style-type: none"> <i>1. What are some of the common eye diagnosis that are made for adults greater than 40 years in facility / district- (wait for responses and probe further using the following as guide) bacterial eye infections, viral eye infections, injuries/ trauma, cataract, glaucoma</i> <i>2. What do you think is the difference between cataract and glaucoma and how are they referred to as in the community (</i>

	<p><i>probe along black blindness and white blindness, reversible blindness verses irreversible blindness etc)</i></p> <p>3. <i>Which eye conditions are commonly managed here</i></p> <p>4. <i>Which eye conditions are often referred</i></p> <p>5. <i>Where are the places that your referrals go to (talensi district hospital, bolga regional hospital, bawku presby hospital, tamale teaching hospital, etc)</i></p> <p>6. <i>How many Health promotion activities have been done for the month/year and how about how many were on eye conditions. This include (wait for responses and probe along the following conditions) cataract, glaucoma etc</i></p>
<p><i>3.2 Guidelines and protocols</i></p>	<p>1. <i>What are some the reference books that you have for diagnosing and managing eye conditions including glaucoma – Standard treatment guideline (STG), British national formulary (BNF), GHS reference Book, WHO reference Book , etc</i></p> <p>2. <i>What are the facility protocols for managing eye disease</i></p> <p>3. <i>Are there facility guidelines on use of potentially harmful eye medications , please can give me examples, probe on steroid if it is not mentioned</i></p> <p>4. <i>Other protocols</i></p>

<p>3.3 Treatment available in facility for glaucoma</p>	<p>2. What treatment are available in this facility for management of glaucoma</p>
<p>3.4 How often and how long are glaucoma patients followed up on, what factors influence this</p>	
<p>4. Individual staff, health service and other Factors that influence perceptions and practices of primary level health workers regarding glaucoma</p>	
<p>4.1 Individual (staff) factors</p>	<p>1. What do you think are some personal factors that will influence a primary health worker habit and practice regarding glaucoma- (wait for responses and probe further using the following as guide) – motivation, work load, other sources of stress at the work place.</p> <p>2. What would you consider as important motivating factors for health workers working at the primary level particularly those involved in eye care- (wait for responses and probe further using the following as guide) – money, trainings , leave / off days, equipment to work with, available medicines for patients, patient compliance, posting of more staff to support activities of the unit</p> <p>3. What do you think are sources of stress for health workers working at the primary level- (wait for responses and probe further using the following as guide) – patient numbers , working environment , patient compliance and response to treatment etc</p>
<p>4.2 Health service factors</p>	<p>1. What do you think are some the things that the district provides primary level health workers as a form of motivation (wait for responses and probe along the following conditions) – money , recognition, recommendation, study leave , promotion</p> <p>2. What are the available protocols for managing eye conditions particularly glaucoma –</p>

	<p>3. <i>What equipment are available for managing eye conditions particularly glaucoma, and where are these located (wait for responses and probe along the following conditions) – Snellen chart, ophthalmoscope, pen torch, visual field machine, etc.</i></p> <p>4. <i>Which drugs are available for eye conditions particularly glaucoma in the facility (wait for responses and probe along the following conditions) - antibiotics, steroids, analgesics , combinations, timolol, acetazolamide, xalatan, others</i></p> <p>5. <i>Are drugs covered by the NHIS</i></p> <p>6. <i>How much would it cost the patient to pay for diagnosis and management of glaucoma per month or per visit with an eye condition , please specify some examples, (probe about glaucoma if it is not mentioned)</i></p> <p>7. <i>What do you think are some of the ways facility managers in the district use in supporting or otherwise, eye care particularly glaucoma eg outreach sponsorship</i></p>
<p>4.3 Others</p>	<p>1. <i>What are the NGO supported activities geared towards glaucoma and blindness in the district</i></p> <p>2. <i>What are the private facilities that provide eye care in the district</i></p> <p>3. <i>What are the traditional healers providing eye care in the district</i></p>

	4. <i>What are your views on the activities of the above</i>
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ANNEX 15 GUIDE FOR OBSERVATION

Exploring the knowledge, perceptions and practices of primary level health workers in Talensi district of the upper east region of Ghana regarding glaucoma and blindness.

FACILITY INFORMATION	
Facility code	
Level of care	
Highest grade of staff available	

CONSULTING ROOM / OPD	
Protocols and guidelines	<p>Protocols on diagnosis and management of common eye condition particularly suspected eye infections and visual impairment (displayed or in shelf)</p> <p>Protocols on diagnosis and management of common causes of blindness particularly Cataract, Glaucoma(displayed or in shelf)</p> <p>Protocol on use of steroids (displayed or in shelf)</p>
Reference books	<p>STG</p> <p>BNF</p> <p>WHO guideline</p>
Pictorial presentation of eye conditions	General eye

	Glaucoma Cataract
Diagnostics	Snellen chart (evidence of use or not) Ophthalmoscope (functioning or not)
Check for burden of eye condition relative to general OPD cases	Check from consulting room or health information office for previous month data
Check consulting room book for commonly diagnosed eye condition	Check eye unit for the last month

PHARMACY	
Eye medicines groups available	
Antibiotics available	Not combined with steroids Combined with steroids Check register for commonly prescribed
Anti-glaucoma drugs available	
Any guideline/policy at pharmacy on dispensing of eye medications	Antibiotics Anti-inflammatory medicines Steroid based combinations
Cost of glaucoma medicines available (please indicate if covered by the NHIS or not)	

THEATRE	
Theatre space available for eye surgeries	

Glaucoma / eye surgeries that can be conducted here	
Eye surgeries conducted over previous month	

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