

**ACCESSIBILITY AND UTILIZATION OF EYE HEALTH SERVICES
IN TERTIARY HOSPITALS IN DAR ES SALAAM, TANZANIA**

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By

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**A Dissertation Submitted in (Partial) Fulfilment of the Requirements for the Degree
of Master of Public Health of**

**Muhimbili University of Health and Allied Sciences
October 2020**

CERTIFICATION

The undersigned certify that, she has read and hereby recommends for examination by Muhimbili University of Health and Allied Sciences, a dissertation titled “*Accessibility and utilization of eye health services in tertiary hospitals in Dar es salaam, Tanzania*”, in partial fulfilment of the requirements for the degree of Master of Public Health of the Muhimbili University of Health and Allied Sciences.

DR. GLORIA SAKWARI, PhD

(Supervisor)

Date

DECLARATION AND COPYRIGHT

I, **Rebecca Elias Kasika**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature..... **Date**.....

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Last but not least I thank God for my life through all tests in the past three years. "You have made my life more bountiful. May your name be exalted, honored, and glorified."

DEDICATION

I dedicate this research report to my dear parents Pr. & Mrs. Elias Kasika, their wish and dream was for me to have Master of Public Health. This research is also dedicated to my husband Mr. Fajara Mafuru for making my parent's dream a reality by funding my studies at MUHAS and my supervisor Dr. Gloria Sakwari for guiding me at every stage during my studies.

ABSTRACT

Background of study: Over 250 million people live with vision impairment worldwide. The majority are from low income countries where funds to facilitate eye health services are limited. In Tanzania, prevalence of vision impairment is around 1.9 percent of the total population and 2.8 percent for people above 50 years.

Objective: To assess accessibility and utilization of eye health services in tertiary hospitals in Dar es Salaam.

Methods: This was a cross-sectional study done at Muhimbili National Hospital and CCBRT. The study employed mixed approach; data was collected using survey questionnaire, in-depth interviews, small group discussion, and observation checklist. The population for this study included eye health patients (n=357) who were randomly selected, whereas eye health workers (n=13) were purposively selected. Quantitative data were analysed by SPSS software where continuous data were analysed using independent t Test and categorical variables were analysed by frequency. Thematic analysis was used to analyse qualitative data.

Results: Nearly half (49.3%) of the study participants declared eye services affordability difficult. Over 40% of the study participants rated the overall availability of eye health services including health care workers, waiting hours and medicine difficult. Forty three percent (43%) of study participants had a monthly income of 100,000 TZS and below. One out of every two participants had health insurance, 1/5 of participants with insurance had cover for spectacles. Average transport time to MNH was 397minutes; waiting time was 255.10 minutes and average time taken in the Doctor's room 28.51 minutes. Patients who visited CCBRT hospital had a longer travel time (458 minutes) average waiting time was shorter (141.13minutes) and time spent in the doctor's room had no significance difference from that of MNH, 24.53 minutes.

Conclusion: Affordability, availability and patient waiting time are greatly linked to accessibility and utilization of eye health services. Long waiting hours and lengthy queue due to inadequate human resource for eye health has been found to be a key issue hampering availability of services. Affordability is still a challenge to patients with health insurance and those who pay out of pocket. Tertiary hospitals can improve this by addressing these barriers when planning for eye health services.

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ABBREVIATION

CCBRT	Comprehensive Community Based Rehabilitation in Tanzania
FGD	Focused Group Discussion
GoT	Government of Tanzania
HCW	Health Care Workers
HReH	Human Resources for eye Health
IAPB	International Agency for the Prevention of Blindness
IDI	In-Depth Interview
MC	Municipal Council
MNH	Muhimbili National Hospital
MoHCDGEC	Ministry of Health Community Development, Gender, Elderly and Children
MUHAS	Muhimbili University of Health and Allied Sciences
NBS	National Bureau of Statistics
NCDs	Non-Communicable Diseases
NECP	National Eye Care Program
PHC	Primary Health Care
SGD	Small Group Discussion
SPSS	Statistical Package for Social Sciences
UN	United Nations
WHO	World Health Organization

DEFINITIONS

1. **Accessibility of health services:** is understood as the availability of good health services to people when they need them. In terms of economic, it refers as a measure of people's ability to pay for services without financial hardship. It takes into account not only the price of the health services but also indirect and opportunity costs (e.g. the costs of transportation to and from facilities and of taking time away from work) (WHO, 2000). The study assumes that all eye patients have equal access to eye health services and they can afford to pay for the services if available.
2. **Availability of health services:** refers to physical presence, coverage of health services for delivery and utilization of health services that meet minimum standard (WHO, 2000). In this study presence of HReH, equipment and medicine for eye health services are considered as availability of treatment to eye patients.
3. **Affordability of health services:** refers whether organization or health facility has sufficient fund and all needed resources to provide health care services to targeted population. While to patients, affordability of health services can be defined as the ability to pay for required health services without increasing financial burden to patient (WHO, 2000). In this regard, the study measures the cost incurred by eye patients to receive treatment and medicine as well as if they managed to afford all they are required to pay for that day's treatment.
4. **Health care utilization:** This refers to the use of health care services. It includes the way public uses health care for many reasons including preventing and curing health problems, promoting maintenance of health and well-being, or obtaining information about their health status and prognosis (Bolutife et al 2016). The underlying assumption is that, general public and eye patients in particular have the awareness of seeking eye health services.

5. **Eye health services:** Defined as the process of testing and treating of symptoms and causes of eye related problem. However, the definition expands to include, provision of advice with the aim of reducing or preventing eye related problems such as; eyestrain, red eyes, injuries, blindness, and seeing difficulties (Thomas *et al.*, 2011). The study perceived that, the proposed health facilities have the capacity in terms of HReH, equipment and medicine to provide eye health services.
6. **Eye Patient:** A patient refers to person who is the recipient of health care (WHO, 2011). In this study, eye patient is referred to as recipient of eye care services.
7. **Human Resource for eye Health:** Refers to one of the building blocks for health system which includes: health care workers, who are exclusively trained, equipped and managed to provide eye health services. There are different categories of eye healthcare workers such as; Optometrist, Ophthalmic, and Ocularists (Thomas *et al.*, 2011). This entails the number of skilled eye HCW who will be found at proposed health facilities.
8. **Small Discussion Groups:** This is the qualitative method of data collection which involve gathering information from small group of people ranging from 2 to 5 people who have similar backgrounds or experience on the specific topic of interest that is being discussed (Charmaz, 2006)

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the study

Around 250 million people live with vision impairment worldwide, of which 36 million are blind. The vast majority lives in low-income settings. More than 80% are aged 50 years or above. Globally, uncorrected refractive errors and un-operated cataract are the top two causes of vision impairment. More than 80% of all visual impairment are preventable and/or curable. Measures to do so should focus on increasing access to quality comprehensive eye care services, including at the community level (World Health Organization, 2017).

Availability and affordability of health services are important issues in the prevention of visual impairment. Accordingly, World Health Organization (WHO) has set initiative called Global vision of 2020 with the goal of eliminating avoidable causes of blindness by the year 2020. The initiative aims to decrease preventable visual impairment by 25% by 2019 by improving access to comprehensive eye care services that are integrated into health systems (WHO, 2013). However, poor practitioner to patient ratios; absence of eye care personnel; inadequate facilities; poor state funding; and lack of educational programs are still considered as the hallmarks of eye care in sub-Saharan Africa, with preventable and treatable conditions being the leading cause of blindness (Naidoo, 2007; Mwakyusa et al. 2017). Availability and affordability of eye care services are important issues in the prevention of visual impairment (Ntsoane, Oduntan, & Mpolokeng, 2012). This calls for measures to prevent the hallmarks and avoidable vision impairment which focus on increasing access to quality comprehensive eye care services, including at the community level (World Health Organization, 2017).

Tanzania as a member state of United Nations (UN) is part of the initiative and striving to improve eye health services through the National Eye Care Program (NECP). There is poor financing of eye health services in Tanzania, also the services for so long have been characterized with inadequate healthcare workers (HCW); technologies and equipment (Mwakyusa et al. 2017). All these have direct relation to availability and affordability of eye health services among eye patients in Tanzania.

However, prevalence of blindness in Tanzania in 2017 is estimated at 2.8% This is higher than the world average of 0.48% and lower than 4.3% estimated for the Eastern sub-Saharan region (Flaxman et al., 2017). This prevalence is limited to those aged 50 and above years, hence estimates are higher than the 1% blindness estimated in the general population. Management of eye health interventions in the MOHCDGEC falls under two directorates the directorate of curative and the directorate of preventive services. The national eye care program sits under the Non-Communicable Diseases (NCDs) section of the curative services department and does not get as much priority as other NCDs (Mwakyusa et al. 2017).

1.2 The Statement of Problem

More than 250 million people live with vision impairment worldwide. The majority are from low income countries where the fund to facilitate eye health services are inadequate (WHO 2017). According to The Population and Housing Census (PHC) of 2012, it was estimated that at least 1.9% of the total Tanzania population has vision impairment. This makes eye problems in the country a public health problem.

The government of Tanzania (GoT) through National Eye Care Program (NECP) contributes to health care financing including eye health in efforts to improve eye health services. Yet, eye health services have been disadvantaged by weak health system attributed to limited financial services and uneven distribution of eye health workers, technologies and equipment (Mwakyusa et al. 2017).

Despite the fact that several measures have been taken to address eye related problems, still such efforts have been laden by weak health system that makes accessibility and utilization of eye health services to be limited. Some scholars (Jolley et al. 2017; Mwakyusa et al. 2017) have addressed issues related to limited access of eye health services and they include; limited funding, lack of human resources, poor integration of eye health into primary eye care, and lack of equipment.

However, these studies did not show the extent of accessibility and utilization of eye health services to eye patients in tertiary hospitals of Dar es Salaam. There is inadequate knowledge on accessibility and utilization of eye health services in tertiary facilities in Dar es Salaam.

It is within this backdrop that catches the interest of this study that aimed at assessing accessibility and utilization of eye health services in tertiary hospitals in Dar es Salaam.

1.3 Conceptual framework

WHO, (2010) has developed conceptual framework for action on the social determinants of health, the key determinants to access of health resources and services are linked to socio-economic and political context and play a significant role to access of health services. In this respect, the topic under the present study adopted various public health ideas in order to assess various factors that may influence availability and affordability of the eye healthcare services. The conceptual framework below shows social-economic and political determinants, which influence the availability and affordability of eye health services (Figure 1)

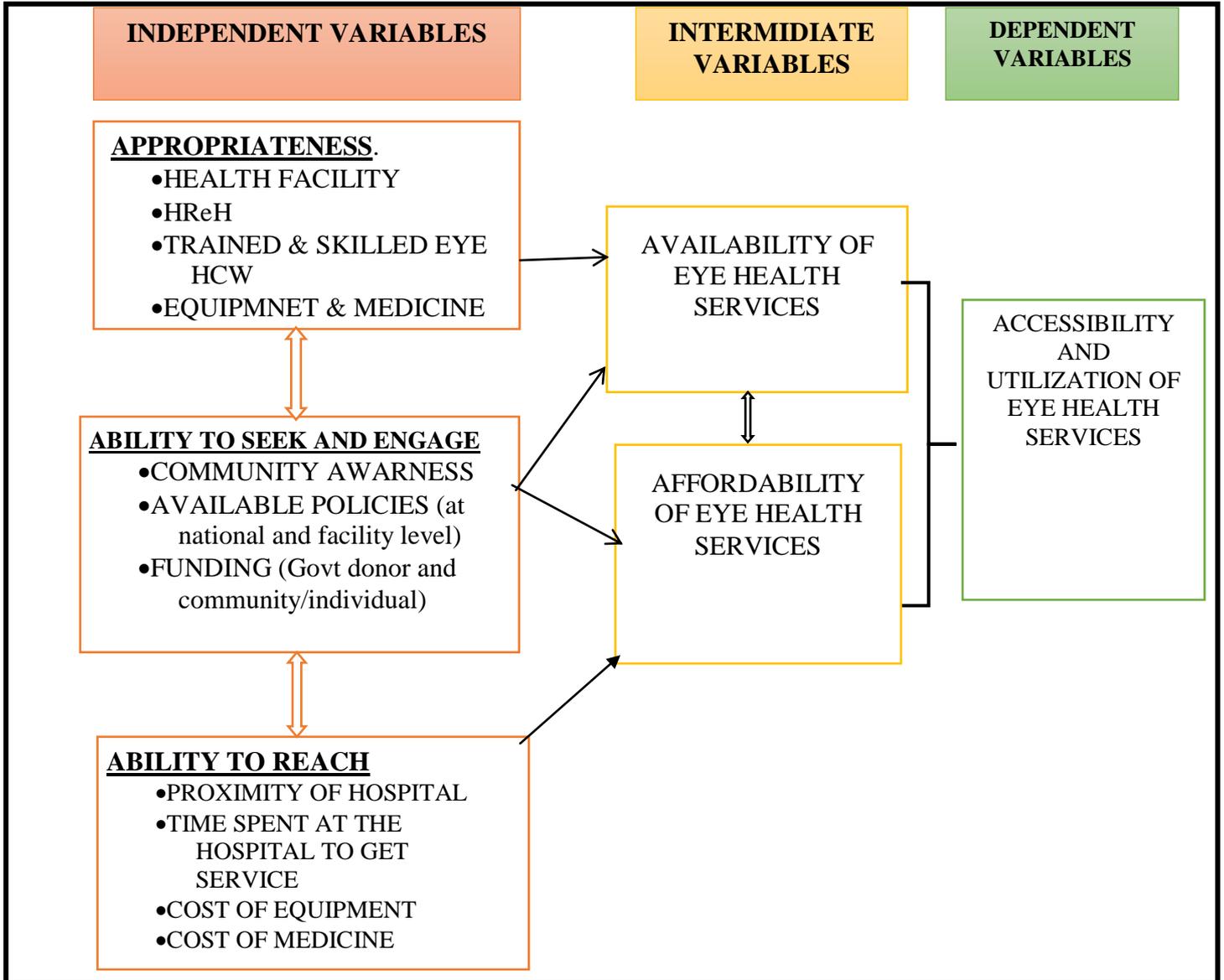


Figure 1: conceptual framework for availability and affordability of eye health services

Source: Adopted and modified from (WHO, 2010)

1.4 Rationale

Carrying of this study substantially contributes to the body of literature for academic researchers and decision makers by establishing status quo of eye health service in Dar es Salaam. Also, the study sheds light on accessibility and utilization of eye health services in tertiary facilities which can be of help to management and decision makers and eye health workers when making decisions on funding and planning for eye health services.

1.5 Research Questions

Main Research Question

To what extent are eye health services accessible and utilized in tertiary hospitals in Dar es Salaam?

Specific Research questions

1. To what extent are eye health services available to eye patients in tertiary hospitals in Dar es Salaam?
2. To what extent are eye health services affordable to eye patients in tertiary hospital in Dar es Salaam?
3. What are the barriers to access eye health services in tertiary hospitals in Dar es Salaam?

1.6 Broad Objective

To assess accessibility and utilization of eye health services in tertiary hospitals in Dar es Salaam

Specific Objectives

1. To examine the extent of the availability of eye health services in tertiary hospitals in Dar es Salaam
2. To examine the extent of affordability of eye health services among patients in tertiary hospitals in Dar es Salaam
3. To describe barriers to utilization of eye health services in tertiary hospitals in Dar es Salaam

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 An overview of Eye Health problem: Causes and Prevalence

Visual impairment and blindness are major public health problems worldwide especially in the developing countries (Ntsoane et al., 2012). Recent data by WHO indicated that globally, approximately 1.3 billion people live with some form of distance or near vision impairment the leading causes of vision impairment being uncorrected refractive errors, cataract, age-related macular degeneration, glaucoma, diabetic retinopathy, corneal opacity and trachoma (WHO, 2018).

2.2 Availability of eye health services

Eye health services provided in any country or health facility is the function of several interrelated issues as the presence of one influence the other, so do eye health services become available to all people. These influences include but not limited to the following; presence of health facilities that provide eye health services; ratio of Human Resource for Eye Health (HReH) to patients; skilled eye healthcare workers; equipment and medicine. These issues are elucidated in detail in the proceeding subsections;

2.3 Integration of eye health services in health facilities

The quest to promote eye health services availability and prevention of avoidable blindness and visual impairment have been emphasized by the global eye health action plan through integrating eye care programs into the wider health care system at all levels i.e. primary, secondary, and tertiary (WHO, 2013). Availability and acceptability of services and the attractiveness of the value gained by using available health facilities are among the factors which influence the utilization of health facilities (Bolutife et al 2016). Scarcity of eye care services has been reported in the rural areas of many developing countries such as Jamaica, Latin America and the Caribbean, South Africa, Nigeria and India (Ntsoane *et al.*, 2012). Studies have shown poor Integration of eye health into primary care services in Tanzania (Jolley *et al.* 2017)

2.4 Human Resource for Eye Health

Human Resource for Eye Health (HReH) is another crucial factor, which influence the provision of eye health services in any health facility. The number of available HReH will determine the capacity of health facility to provide eye health services to patients, and the vice versa is true. When it comes to ratio of health care workers (HCW) and HReH in particular, developed countries are doing better. In Europe, for instance Germany, United Kingdom and France, eye health services are comprehensively and exclusively integrated in health care system and the ratio of HReH to eye patients is reasonable (Thomas *et al.*, 2011).

Despite the fact that availability of Human Resource for Eye Health (HReH) is of necessity to ensure that eye health services are available to all communities. Yet, this is still to be realized in sub-Saharan African countries, the ratio of HReH for eye health services to patients with eye health problems is unrealistic. It was revealed by (Bozzani and Griffiths, 2011) that in Zambia the ratio eye HCW is worse with one ophthalmologist for every 725,000 Zambians. This leave large burden on eye health services, which in turn make the services to be limited.

2.5 Skilled eye healthcare workers

HReH might be available to provide the services but they might not have appropriate skills to do so leading to the same problem of limited availability of eye health services (Courtright *et al.*, 2016; Naidoo, 2007). Eye health is seen as a specialist area of healthcare (Mafwiri *et al.*, 2016). Henceforth, having eye HCW with appropriate skills helps not only for the services to be provided efficiently and effectively, but also for eye patients to be treated without being referred to another health facility. Eye health services in European country like France and Germany are exclusively provided by three different categories of professionals namely ophthalmologists, orthoptists and opticians. On top of these categories, all paramedics HCW are trained with primary eye health care, thus even at the time of emergency eye patients will receive primary eye health care while waiting to see specialist (Thomas *et al.*, 2011). Inappropriate or overprescribing of spectacles was identified in studies from India and Mexico (Esteso *et al* 2007, Gogate *et al* 2013) as a

factor hindering availability of services to patients. This explains that the tools and medicine may be available but due to poor skills of the health care worker, the patient may not receive the services needed.

In Africa, eye healthcare specialists are not adequate. However, trainings and capacity building initiatives are the solution to improve the skills of eye HCW. In 2014, International Agency for the Prevention of Blindness (IAPB) conducted the study on crisis of eye healthcare workforce in sub-Saharan Africa countries and it was revealed that there is catastrophic shortage of specialist on the eye health sector. Majority of people who became blind was due to lack of Cataract surgical rates as the countries do not have enough number of specialist to perform the surgeries (IAPB, 2014). Again, similar view was revealed in Kenya and Malawi, where the eye health sector lack competent eye HCW to provide eye health services to communities (Kalua et al., 2014).

While in Tanzania several interventions have been put forward by GoT and private organizations to integrate primary eye health in health system through training of primary HCW to diagnose and manage the less serious but common eye conditions (Jolley et al., 2017; Mrisho, Mkopi, Salaam, & Bakar, 2014). Despite these trainings, still eye health services in the country is burdened by lack of specialist eye health workers who are exclusively providing eye health services. Also, the available number of eye HCW is unevenly distributed in the country (Mwakyusa et al., 2017).

2.6 Eye health equipment and medicine

Lastly but equally important, number of equipment and medicines also play significant role to ensure that eye health services are provided to people in need. The health facility might have eye HCW who are ready to provide the services to people but without the equipment and medicine procedures for eye test and treatment becomes impossible making the services to be limited.

The study conducted in Zambia showed that, majority of health facilities lack equipment particularly spectacles; cataract sets; trial lenses and frames. Whereas, the most common reasons for equipment being out of order are the absence of maintenance technicians and, especially in the case of donations, the absence of trained personnel able

to assemble and operate it. Most of health facilities which are under government tends to lack equipment and medicine to support the access of eye health services (Bozzani and Griffiths, 2011).

Similar to Tanzania, it has been revealed that there is a limited eye health infrastructure particularly at the district and regional level, ophthalmological equipment lack in most regional and district hospitals which are under government ownership (Mwakyusa et al., 2017). These factors may challenge the availability of services to patients. Lack of equipment and medicine is not the only shortage facing Tanzania health facilities but also recording registers which might aid in giving the snapshot on the magnitude of eye health problem in the country. To be exact, there is a register book called Health Management Information System (HMIS) register number 16 for recording eye health data. Nonetheless, data from the national and zonal referral hospitals are not captured, many eye private hospitals and clinics do not report eye patients' information to the district authorities. This results to availability of little information on eye health, which affects proper planning, and allocation of resources (Mwakyusa et al., 2017).

2.7 Affordability of eye health services

Many people cannot afford the cost of eye care services and hence conditions, which could have been treated at an early stage are not attended to and may result in low vision and blindness this is due to poverty which affects many rural areas of the world (WHO 2000). In sub-Saharan Africa, health care is available through the public health service. It consists of primary, secondary and tertiary levels, which in most instances focus on providing curative care. The role of the private sector is increasing, mainly in urban settings (McKinsey 2010) Patients better utilize eye care services when there is improved quality of services. Income levels greatly influence affordability of eye care services in both the developing and developed nations (Robin et al 2004), finances can definitely influence the utilization of ophthalmic health care.

In Tanzania, there are free exemption and waiver policies for vulnerable populations such as children ages 0-5years, the elderly (60 years and above), people with chronic illnesses, and those who cannot manage to pay for treatment. But the policy implementation is challenged by lack of equipment and supplies, eye medication, eye health human resources (Mwakyusa et al 2017). Little is known on affordability of eye health services in tertiary hospitals of Tanzania.

2.8 Barriers to access of eye health services

Understanding barriers of eye care services utilization is very crucial for planning strategies to prevent blindness. Beliefs, attitudes towards blindness, fear of treatment, traditional practices, lack of faith in the intervention, and fear of the surgical procedure influence the behavior of patients, leading to low acceptance levels. Studies in China, India and Peru revealed that an insufficient number of eye care specialists created barriers to referrals and follow-ups (Ntsoane et al., 2012).

In Sub Saharan Africa, barriers to accessing eye care services are caused by limited engagement with communities, a shortage of appropriately skilled health personnel, and inadequate support from health systems and this results to unmet eye care needs (Du Toit et al., 2013). The study conducted by (Jaggernath et al., 2014) revealed that the burden of vision impairment is high in poor people. Similar view is from studies conducted in Nigeria and Kenya indicted that lack of funds was among barriers to seeking eye care services (Ndengwa et al 2005, Ebeigbe et al 2014). Further studies suggest that prescribing spectacles for moderate vision impairment should be balanced with cost and readiness to pay (Gogate et al 2013). This is important particularly in low income countries where most people are very poor and they depend on free government health services because they cannot afford to pay for health services.

Free access to essential medicines is a fundamental right. Governments should provide accessible and affordable medicines to people (Qais et al, 2018) but this can be challenging in most developing countries due to competing priorities in health care for example in Tanzania where eye health services receive limited financial resources to meet population needs (Mwakyusa et al 2017).

Another barrier to access services in Tanzania is the delay in accessing appropriate specialist care following eye injury which occurs after first visiting a health facility (Al-Attas, Williams, Pitchforth, O'Callaghan, & Lewallen, 2010). Little is known on whether this barrier is also facing patients visiting tertiary hospitals in Tanzania hence the study aims at determining barriers facing patients seeking eye health services in tertiary hospitals.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

This study employed a cross-sectional research design. This design is appropriate due to the fact that it enabled the study to identify the availability and affordability of eye health services from two groups of health facilities. These two groups included patients who receive eye healthcare from government and private health facilities. According to (Creswell, 2012) cross-sectional design is highly suitable for comparing the services offered from two different groups, this includes government and private health facilities. Hence, it helps to unpack the meaning that eye patients attach to availability and affordability of eye healthcare services in relationship to the health facility's socio-political context and practice.

The study used mixed approach. At first, the study employed quantitative approach, which was carried out in identified health facilities and patients for thorough investigation of factors influencing availability and affordability of eye healthcare services.

Then qualitative component followed to compliment the findings gathered by quantitative. The rationale for selecting qualitative component was vested on the ability of the approach to investigate the problem under the study in deeper layer, while reflecting the knowledge and lived experiences of eye health services.

3.2 Study area

The study was conducted in two tertiary hospitals namely Muhimbili National Hospital (MNH) and CCBRT found in Ilala and Kinondoni municipality, respectively. The justification of the selected tertiary hospitals lies on the fact that, MNH and CCBRT are tertiary hospitals that receive high number of eye patients who have been referred from other health facilities across Tanzania due to lack of services. Henceforth, conducting the study to these tertiary hospitals can give enough evidence on the situation of eye health system found in the other area. Furthermore, areas reported by patients were highlighted to give the scope covered by the two tertiary referral hospitals.

The statistical data on difficult in seeing in Tanzania is 1.9 percent, while Dar es salaam region had high rate of 1.7 percent of its population reported to have eye impairments compare to other regions in Tanzania, (NBS, 2014 and 2016). Furthermore, comprehensive eye health services in Tanzania are provided in few health facilities that have the capacity in terms of equipment, medicine and Healthcare Workers (HCW) to provide the services. Thus, eye health services are more likely to be found in hospitals. Ilala and Kinondoni municipalities have only 2 tertiary hospitals, 1 under government and 1 under private ownership.

In consistent to the proposed design, the study was conducted between eye health services provided in two different health facilities whereby one is under government ownership which is MNH and CCBRT which is under private ownership. The reason for choosing these two health facilities lie of the fact that, during the situational analysis, carried by researcher, it was identified that MNH and CCBRT are among few health facilities have the capacity of providing the service to high rate of eye patients. The average of eye patients per day is estimated to be 75 and 200 for MNH and CCBRT, respectively.

3.3 Study population

MNH and CCBRT provide eye health services to different eye patients who have been either referred by other health facilities or relatives from across the country. Therefore, the study population included all eye patients attending services in the selected hospitals at the time of the study and eye health workers in the said hospitals regardless where they have been referred from.

3.4 Sample size

The calculation of sample size of quantitative component included the parameters presented in table 1.

Table 1: Sample Size Estimations

Since the estimated population of eye patients who visit the tertiary facilities is 7000, sample size was calculated by using finite population.

Variable	Parameter
Finite Population of eye patients visiting tertiary facilities (N)	7000
Prevalence of outcome/Dependent variable	50.0%
Desired precision	0.05
Power of the study	95.0%
Z score	1.96
None response	10%
Design Effect	1

$$\text{Sample size } n = [\text{DEFF} * Np(1-p)] / [(d^2/Z^2_{1-\alpha/2} * (N-1) + p*(1-p)]$$

Where; N=Finite population, DEFF=Design Effect, d = the desired level of precision (i.e. the margin of error) and Z = Z score, P is equal to estimated proportion of the population which has the attribute in question.

The Probability Proportionate to Size (PPS) was considered in order to get the minimum sample size which is equivalent to the average number of daily eye patients in proposed hospital. Since, Muhimbili National Hospital (MNH) attends the average of **80** eye patients and CCBRT attends average of 150 patients. Number of participants from each hospital was;

$$n_0 \text{ of participants from CCBRT} = \frac{150 \times 365}{230} = 238$$

$$n_0 \text{ of participants from Muhimbili} = \frac{80 \times 365}{230} = 126$$

Due to non-response rate, the sample size from each hospital was 264 and 140 for both CCBRT and MNH respectively

Sample size for qualitative component: the selection ensured that the study continues to gather new insights until the level of saturation sparks no new information from the ones obtained from previous study participants.

Participants who have rich and in-depth layer of information of the subject under the study were selected for interview. The study included HReH who are found at optical clinics or department and they included but not limited to the following; 2 ophthalmologists, 1 assistant medical officer in ophthalmology, 2 eye care co-ordinators 2 optometrists and 8 ophthalmic nurses who are working in eye clinics. Table 2 summaries the sample size distribution for quantitative and qualitative.

Table 2: Sample size distribution per study area

	MNH	CCBRT	Total
Quantitative sample size			
Proposed sample size	126	238	364
Sample with non-response rate	140	264	404
Qualitative sample size			
Ophthalmologists	1	1	2
Assistant Medical officer in Ophthalmology	0	1	1
Eye Care Co-ordinator	0	1	1
Optometrists	1	1	2
Ophthalmic Nurses	3	4	7
Total HCW	5	8	13

3.5 Sampling procedures

At the very first stage, MNH and CCBRT were purposively selected for the study. The study sampled representative number of eye patients and eye healthcare workers. In this regard, the sampling procedure of this study was two-fold; one including sampling for quantitative component while the other focusing of qualitative component.

The quantitative part of the study employed stratified sampling design complementarily with random sampling procedure. As the number of eye patients was randomly selected from stratum i.e. government (MNH) and private (CCBRT) hospitals until the proposed sample size was reached. In this line, dividing the sample into strata diversified a wide range of information to be generated. Likewise, it helped the study to take hold of the perception of dissimilar categorical groups to make comparison of the problem under the study possible. Moreover, the inclusion criteria for sampling study participants was based on eye health patients who are not too ill or too anxiety to go blind.

The qualitative component of this study assumed purposively sampling technique. The use of this technique has its power vested on rich information, knowledge and experience that eye healthcare workers have with services being offered.

3.6 Data Collection Methods

The study used both qualitative and quantitative research approaches; therefore, data collection exercise employed triangulation approach, whereas the study made use of different data collection methods to complement the findings and results gathered from another method. Moreover, the subsequent paragraphs elicit how the objectives which guide the proposed study were operationalized.

The first objective focuses on examining the availability of eye health services in proposed facilities. This objective was measured by examining the following variables; number of eye healthcare workers, eye equipment, referrals of eye patient and the reasons for such referrals. Specifically, availability was measured by the ratio of health care workers to patients; equipment availability was computed as a score as per national guideline and medicine availability was computed as a score per national guideline.

In consistent, affordability of eye healthcare was measured by the following variables; average income of eye patients in relation to the cost incurred to referred eye healthcare, proximity of the hospital providing eye healthcare. Willingness of eye patients to pay for the services helped to establish the affordability of the services. On the other hand, affordability of eye health services was viewed from the amount of budget allocated for eye health services. Payment methods were used to assess affordability of eye health services also the number of visits attended by eye patient and overall level of satisfactions with availability of eye services such as number of hours spent at the facility.

Utilization of eye health services was addressed by measuring the patient's awareness of eye health related problems and their ability to seek medical services. Also, availability of policy guiding provision of eye health services were analysed. Again, the components of availability and affordability shed the light to the overall utilization of eye health services

3.7 Questionnaire

For quantitative data, questionnaire was employed to gather data from eye patients found at hospital during interview date (Appendix 2). The researcher randomly administered the questionnaire to eye patients until the required sample size was reached. The reason of proposing to use questionnaire, is that it gathered wider range of information regarding quantifiable factors on availability, affordability and accessibility of eye healthcare to communities while reflecting their socio-economic status which may act as determinants toward access to eye healthcare.

3.8 In-depth Interviews

To gather data using this method, the researcher employed the use of in-depth interview guide (appendix 4) which is predominantly structured with open-ended questions so as to give enough room of discussion between researcher and study participants (i.e. eye healthcare provider). The questions found in the guide are aimed to respond to each objective of this present study. Some of information to be gathered from IDI include; strategies for improving human resource for eye healthcare; access of eye healthcare and procedures taken by eye patients with health insurance card and those who do not have.

More importantly, this particular method was used to eye healthcare workers who are believed to have deep information and knowledge regarding eye health care and services at their respective offices. The method involved study participants; ophthalmic medical doctors, ophthalmic medical assistant, eye care co-ordinator, and ophthalmic nurses

3.9 Small Group Discussions

Following the busy working condition and the average number of eye patients attending the eye clinic it was not viable to use Focus Group Discussion (FGD) which takes 30 minutes to 1 hour of 8 to 15 nurses, hence Small Group Discussion (SGD) was more viable. SGD can be described as the qualitative method of data collection which involve gathering information from small group of people ranging from 2 to 5 people who have similar backgrounds or experience on the specific topic of interest that is being discussed. In this study, SGD was employed to gather information from eye healthcare providers mainly nurses working at CCBRT Hospital but for MNH we had to use in depth interview to the nurses because they were few and having them in a group discussion would affect the clinic sessions.

SGD was administered using a guide which has open-ended questions structure to answer the objectives of the study (appendix 5). The SGD was conducted around hospital premises in a quiet and comfortable environment, which have fewer disturbances to allow study participants to freely speak of issues related to eye healthcare services. Again, all interviews carried under SGD method were digitally recorded after getting the informed consent from study participants.

3.10 Observation and Data Abstraction Checklist

The study employed observations and data abstraction as other methods of data collection. For observation, the study saw the real practice of how eye patients are treated at study areas. In this regard, the study observed the flow of eye patients from entry point, to waiting hours; then study observed how eye patients are being diagnosed, provided with medication and consultation, and lastly exit point of eye patients; this included time spent from entry to exit.

The use of observation helped the study to identify the availability of basic and necessary equipment required for eye health services (Appendix 3). In terms of data abstraction, the study aimed at establishing the capacity of studied hospitals in terms of the number of eye healthcare providers, and number of eye patients who have been provided with eye health services.

3.11 Validity and reliability of data collection instruments

In scientific investigations, validity and reliability of the study must be paramount. On this note, the study used content validity by adopting questions from data collection tools which have been employed in previous studies (Thomas *et al.*, 2011) and standardized tools from WHO (2015). Eye health expert modified some of the questions in order to reflect the context of study area. Validity of study tools was assured through pre-test. The pre-test involved 10% of proposed sample (n= 43) from selected hospitals found in Ilala municipal. During pre-test the researcher was able to correct spelling errors and edit other questions in order to ensure validity of the data collection instruments.

In terms of reliability, the study adopted Cronbach's coefficient Alpha, whereas to check reliability of variables the study assumed Cronbach's coefficient of 0.70 or higher measure the internal consistency of items measuring eye health utilization, availability and affordably. This was done by adopting (Pallant, 2013), procedures for checking the reliability of a scale on Statistical Package for Social Scientist (SPSS).

To ensure rigor and robustness of qualitative data, the study ensured the credibility and consistency by clearly recounting the approach and procedure for data analysis and the justification of the procedures in the context of the study.

3.12 Data management and analysis

Data management and processing involved data entry and data cleaning using SPSS. After data entry and cleaning, all data was exported to Statistical Package for Social Sciences (SPSS) version 23 for analysis and interpretation.

The dependent variable includes accessibility and utilization of eye healthcare services which may be influenced by availability and affordability of eye healthcare services. The independent variables include social economic characteristics of eye patients (i.e. age, income), availability of HCW, eye medicine and equipment at hospitals.

Data analysis of the above mentioned variables included descriptive analysis. Descriptive analysis was used to analyse the socio-economic profile of study participants and capacity of hospitals in terms of number of HCW, available eye health equipment's and number of eye patients treated. Table 3 provides detail analysis plan for each study objective.

Table 3: Data analysis plan

S/N	Objective	Data analysis	Data presentation
Quantitative data analysis plan			
1	To examine the extent of the availability of eye health services among eye patients in tertiary hospitals in Dar es Salaam	Mean score was used to determine availability of essential equipment, medicine needed in tertiary hospital. Also, ratio of HReH to eye patients was determined. Sum of visits per treatment, average of time spent by eye patient before seeing the HCW measured availability of services. Also, Reasons for referral measured the availability of eye health services	Frequencies table, and graphs
2	To examine the extent of affordability of eye health services among patients in tertiary hospitals in Dar es Salaam	Descriptive analysis on average income and mode of payment for services provided.	Frequency tables and graphs

Qualitative Data analysis plan			
	Objective	Themes	Categories
1	To examine the extent of the availability of eye health services among eye patients in tertiary hospitals in Dar es Salaam	<ul style="list-style-type: none"> •Availability of services 	<ul style="list-style-type: none"> •Medicines not available •Inadequate Health care workers •Lack of enough specialists •Equipment available but not used
2	To examine the extent of affordability of eye health services among patients in tertiary hospitals in Dar es Salaam	Affordability of Services	<ul style="list-style-type: none"> •No ability to pay •Health Insurance treatment coverage restrictions
3	To describe barriers to utilization of eye health services in tertiary hospitals in Dar es Salaam	Barrier to utilization of services	<ul style="list-style-type: none"> •Delays in seeking care and failure to utilize services •Financial Constraints: <ul style="list-style-type: none"> ○ No ability to pay out of pocket ○ Health insurance restrictions ○ Delays in exemption` •Inadequate HReH

For qualitative data, thematic analysis was employed to complement the findings from quantitative component for all the objectives as elucidated in Table 3. Whereby, the initial step involved transcribing the audio material and thoroughly reading of all transcripts for several times while taking notes on key concepts raised by study participants. Next, step involved condensing the notes while maintain their quality, then codes and pattern were created into themes; themes were reviewed and then defined and named.

3.13 Study Limitations and Mitigation

Undertaking of this study faced some limitation, first this is a cross section study, may not get other detailed information, in overcoming this limitation, the study used In-depth interviews (IDI) and Small group discussion (SGD) to get detailed information.

Study setting is in hospitals, patients in the community who failed to arrive to the hospital were missed: In overcoming this, the study tried to include both referral and non-referral patients since MNH and CCBRT receive both types. This gave a clear picture from both patients who are direct from the community and those who are referred through the health channels; however this was not the replacement of patients from the community who failed to go to the hospital.

Another limitation of this study falls in the nature of the study area which is hospitals with high volume of patients. This resulted into non-response of study participants. Although the study tried handling this by setting a non-response rate to 10% other patients still refused to be interviewed because they had waited long enough for treatment and were tired and rushing to catch transport back home. The study used strategic approach of randomly selecting eye patients who have already received treatment.

3.14 Ethical Consideration

Ethical clearance was obtained from Muhimbili University of Health and Allied Sciences DRP research review committee with reference number DA.287/298/01A. An official permit to conduct the study in the respective tertiary hospitals was attained, CCBRT/HR/191907 for CCBRT and MNH/TRCU/IRB/Permission/2019/119 for MNH. Informed consent was obtained from patients and workers who participated in the interviews and focus group discussions. Permission to record the interviews was also obtained from key informants. For confidentiality purposes, no identifier was quoted in the write up. Participants had a right to withdraw from participation at any time with no question asked.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-Demographic characteristics of the study participants

Three hundred and fifty-seven interviews (N = 357) were completed. Above half 242(67.8%) were from CCBRT (Private Hospital) and 115(32.2%) from Muhimbili National hospital (MNH) (Public Hospital). More than half 193 (54.1%) were males and 164(45.9 %) were females. Majority of the study participants (38.1%) their age group ranged between 13-32 years. Age of the study participants had an Arithmetic Mean (AM) of 42.19 with standard deviation (SD) of (18.99) years (Table 4).

Majority of study participants 296(82.9%) reported having some form of formal schooling (Primary school to University level qualification) while a few 61 (17.1 %) had no schooling at all. This implied that 82.9% could read and write while 17.1% could not. Participants were from Ilala 66 (18.5%), Kinondoni 59 (16.5%), other Districts in Dar es Salaam 108 (30.3%) and another District Outside of Dar es Salaam 124 (34.7 %) (Table 4).

Table 4: Social demographic characteristics of the study participants (N=357)

Characteristics	N (%)
Hospital Name	
MNH	115(32.2)
CCBRT	242 (67.8)
Sex of the respondents	
Male	193 (54.1)
Female	164 (45.9)
Age group	
13 – 32	136 (38.1)
33 – 52	99 (27.7)
53 – 72	103(28.9)
Above 72	19 (5.3)
Mean age (yrs) AM(SD)	42.19 (18.99)
Education level	
No Formal Education	61 (17.1)
Primary Education	86 (24.1)
Secondary Education	90 (25.2)
College of vocational training	18 (5.0)
University	102 (28.6)
Physical location of respondents	
Kinondoni MC	59 (16.5)
Ilala MC	66 (18.5)
Another District found in Dar es Salaam	108 (30.3)
Another District Outside of Dar es Salaam	124 (34.7)

4.2 Availability of eye health services in tertiary hospitals in Dar es Salaam.

Sixty six percent of the participants had the eye problem for the duration of more than one year (See figure 2). Majority (92%) of the study participants sought eye care elsewhere before visiting the tertiary hospital (Figure 3). Out of those who sought eye care before visiting tertiary hospital (82%) had visited health facilities (Dispensary, Health Centres).

The study revealed that there are many patients to be attended at tertiary eye care facilities with few numbers of personnel. This was reported by a respondent who said:

“Although services are good, with very good customer care, well trained personnel, modern technology and equipment in eye services (advanced eye diagnostic gadgets) with enough space to accommodate many patients, there is still a challenge of in adequate HReH. This is a global challenge. (Respondent 2)

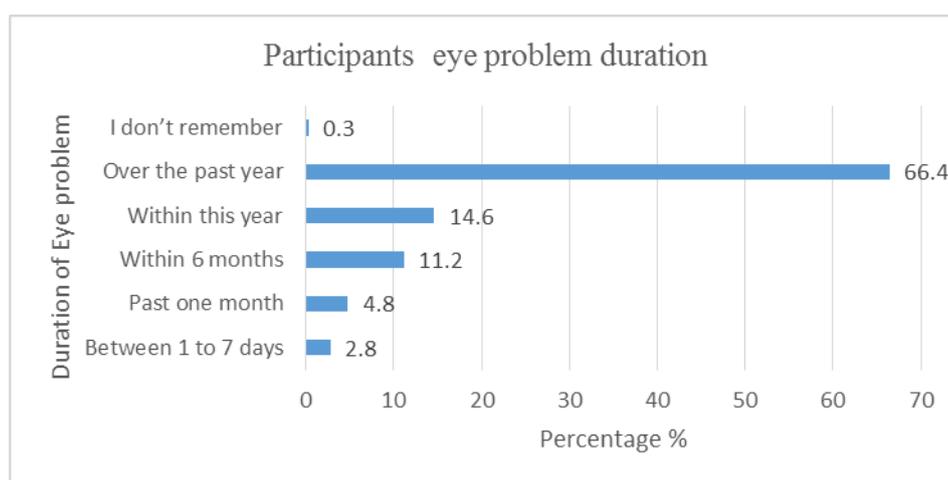


Figure 2: Eye problems duration as reported by participants.

It was reported that eye equipment is expensive and at times, not affordable to all eye care facilities.

“Eye equipment are also very expensive, CCBRT manages because of donor support.”
(Respondent 2)

Availability of services is reported to be hampered by low number of HReH. One respondent said;

“Shortage of staffs is common in all cadres like doctors and nurses. Shortage of adequate medical devices (Equipment and health workers is due to limited budget for Eye health from the government)”. (Respondent 6) Sometimes HReH are not very well trained on using certain eye equipment. This also affects availability of services (Respondent 4)

More than 1000 and 6000 patients visit MNH and CCBRT hospital monthly. There are total of 4 optometrists, 8 ophthalmologists, 8 general nurses, 1 vision therapist and 20 ophthalmic nurses at MNH expected to handle all 1000 patients who require services monthly. In CCBRT there are 7 optometrists, 10 ophthalmologists, 19 ophthalmic nurses, 8 ophthalmic and optometric assistants, 4 general nurses, 2 vision therapists and 1 ocularist expected to attend to 6000 patients who come for services monthly. The patient-practitioner ratio is quite unrealistic; the load is too big to both hospitals and may affects availability of services.

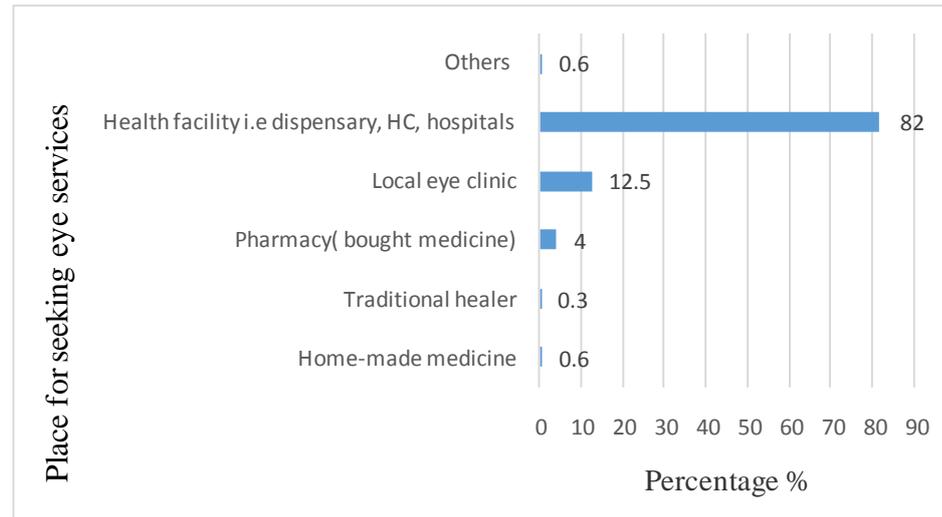


Figure 3: Distribution of place where participants sought eye care services

The results show that majority of patients who sort eye services before the referral hospital 82% visited health facility and 12.5% visited local eye clinic. Most of these areas they lack eye expertise (see figure 3).

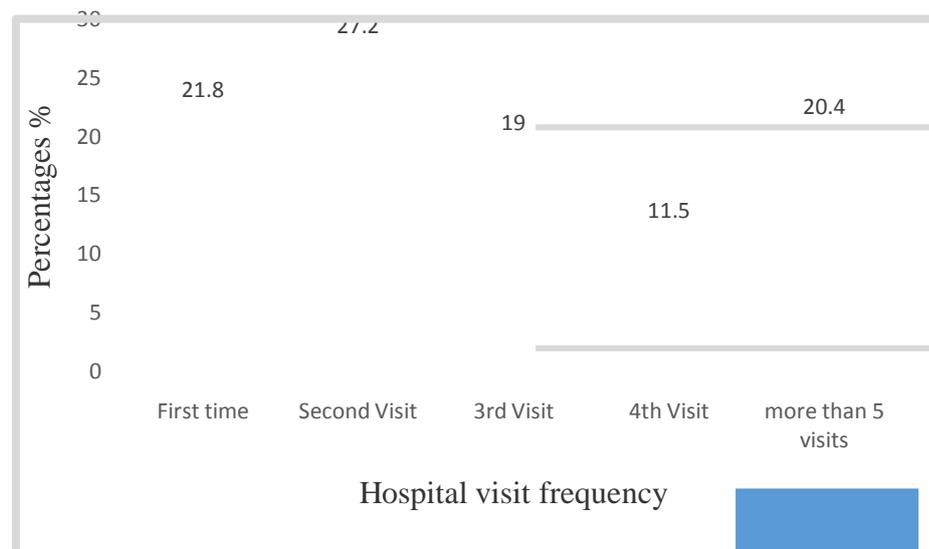


Figure 4: Hospital visit frequency

More than 80% of patients found in the referral hospital during the study were visiting for more than two visits. Some of the reasons mentioned were follow-up visits and long queue due to few eye specialists (figures 4 & 5).

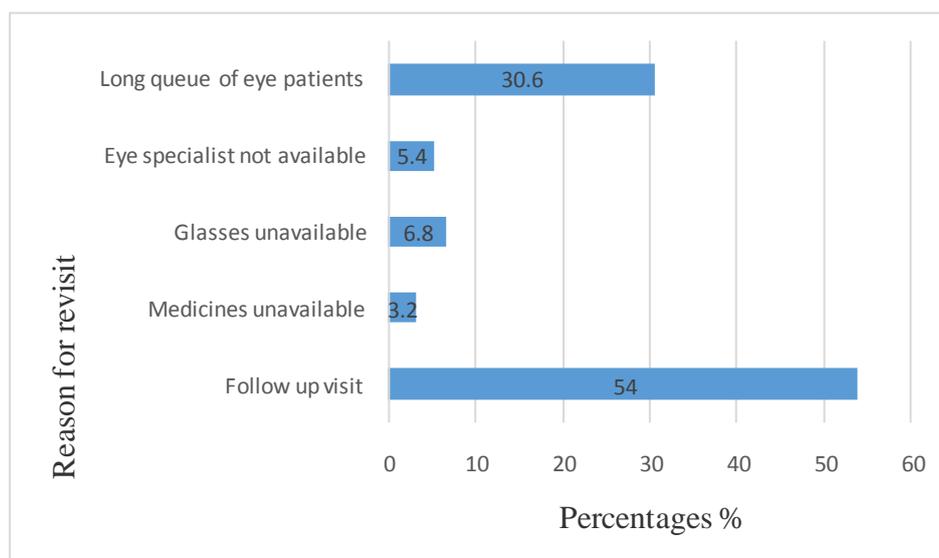


Figure 5: Reasons for frequent visits to the hospital.

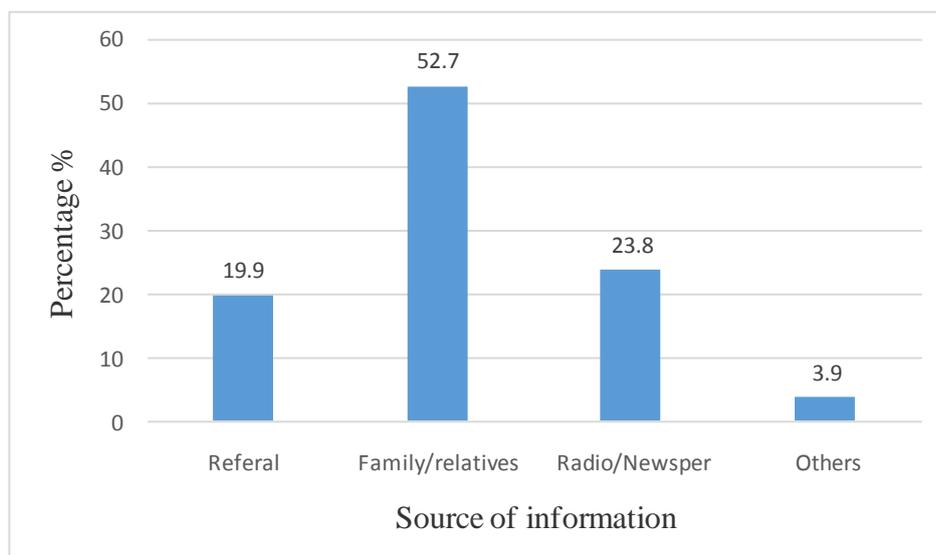


Figure 6: Source of information about eye health services.

Majority of patients (53%) received information about eye services from their relatives/family. This show that eye health education and eye services awareness promotion are not adequately provided at lower health facilities (See figure 6).

Table 5: Showing average time study participants used for Transport, waiting time and treatment

SERVICES ACCESS	Definition	Average time taken (In minutes)			
		MNH	CCBRT	Within DSM	Outside DSM
Transport time	Travel from home to the Tertiary hospital	397	458	109	1025
Waiting time	Waiting for services after arriving to the Tertiary hospital	255.10	141.13		
Treatment	Consultation time	28.51	24.53		

Transport time and waiting time was averagely longer than treatment time in both Muhimbili National Hospital and CCBRT Hospital. Average transport time to MNH was 397minutes; waiting time was 255.10 minutes and average time taken in the Doctor's room 28.51 minutes. Patients who visited CCBRT hospital had a longer travel time (458 minutes) average waiting time was shorter (141.13minutes) and time spent in the doctor's room was 24.53 minutes (Table 5).

Average transport time was different from study participants who are from Dar es Salaam (109 minutes) and those who came from other Regions (1025).

Table 6: Comparison of waiting time and eye services time between MNH and CCBRT (n=357)

Parameters	Mean \pm SD		t	df	95%CI of the mean difference	P-value
	MNH	CCBRT				
Waiting Time	255 \pm 126.4	141 \pm 107	8.42	194.92	87.03, 140.92	<0.001
Treatment Time	28.5 \pm 11.8	24.5 \pm 30	1.67	312.56	-0.70, 8.67	0.03

An independent t-test was conducted to compare the mean waiting time for eye services between the MNH and CCBRT hospital. There was a significant differences in mean waiting time between MNH and CCBRT $t(194.92) = 8.42$, $p < 0.001$. However, mean eye consultation time in between MNH and CCBRT had no significant difference $t(312.56) = 1.67$, $p = 0.03$ (Table 5)

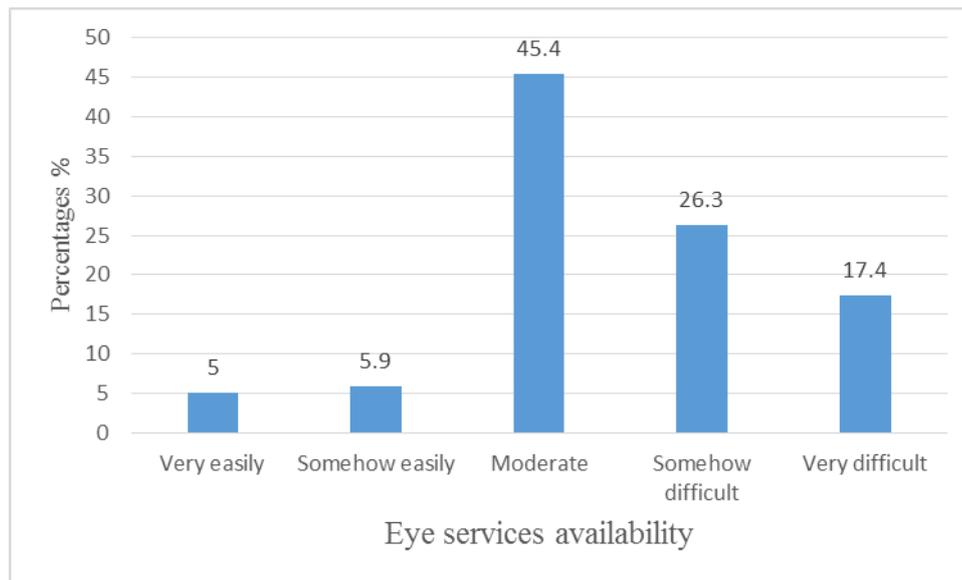


Figure 7: Rating of overall availability of eye services.

Patients were given a chance to rate availability of eye services in the referral hospitals. Majority of the patients (90%) rated the availability of eye services from moderate to very difficult (Figure 7). This show that the availability of eye services even in the referral hospitals is not easy. This might due to reasons stipulated in the figure 5.

4.3 Affordability of eye health services in tertiary hospitals.

Income levels and cost of the services influence affordability of eye care services. The study revealed that 43.1% (154) of the study participants had a monthly average income below 100,000 TZS (Figure 8). Based on reported amount of money that a patient pays per service the mean cost was 123,191 TZS. The study further showed that 50% of the study participants had Health Insurance and 50% did not. Of those covered by insurance only 19.8% had schemes that cover glasses. Thirty three percent (n=117) of the study participants declared that they will not afford to pay cash for services if they don't have health insurance or the current health insurance does not cover for eye health services. Forty eight percent (n=172) of the study participants declared that they will not afford to pay for glasses if they are required to purchase them.

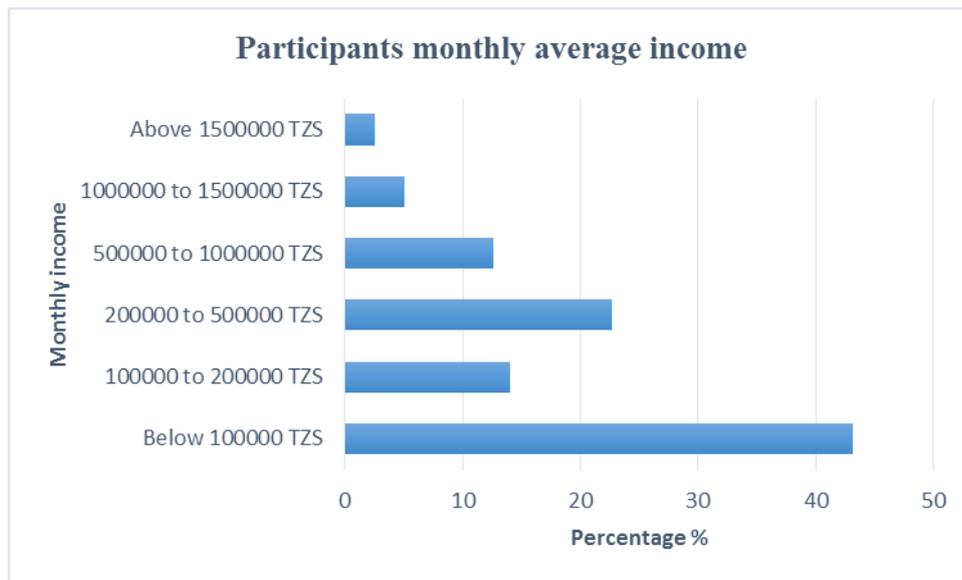


Figure 8: Participants monthly income

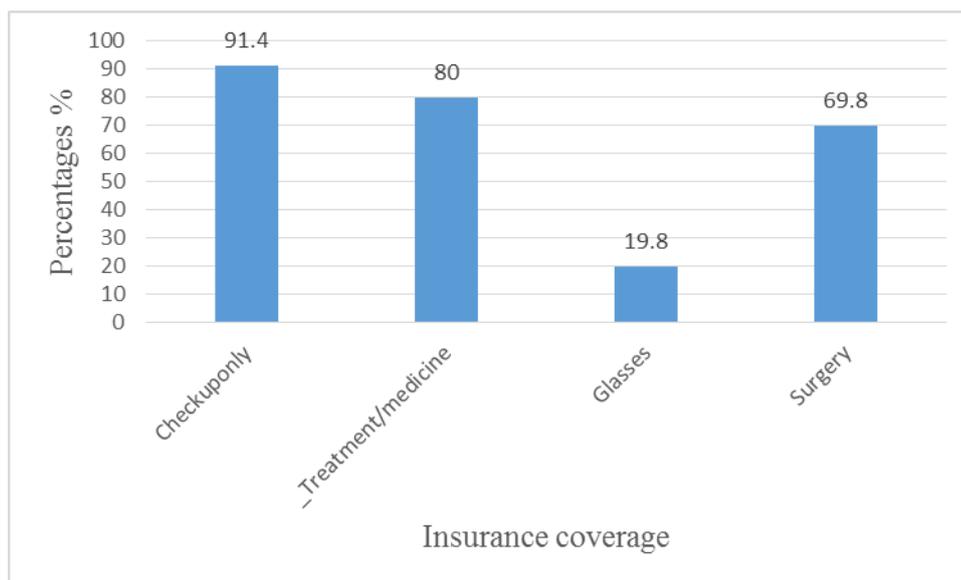


Figure 9: Insurance coverage for eye health services

The study also assessed coverage of health insurance in eye services. The results showed that health insurance does not cover every service in the referral hospital. This shows that patients have to pay from their pocket for extra cost to cover for eye services (See figure 9).

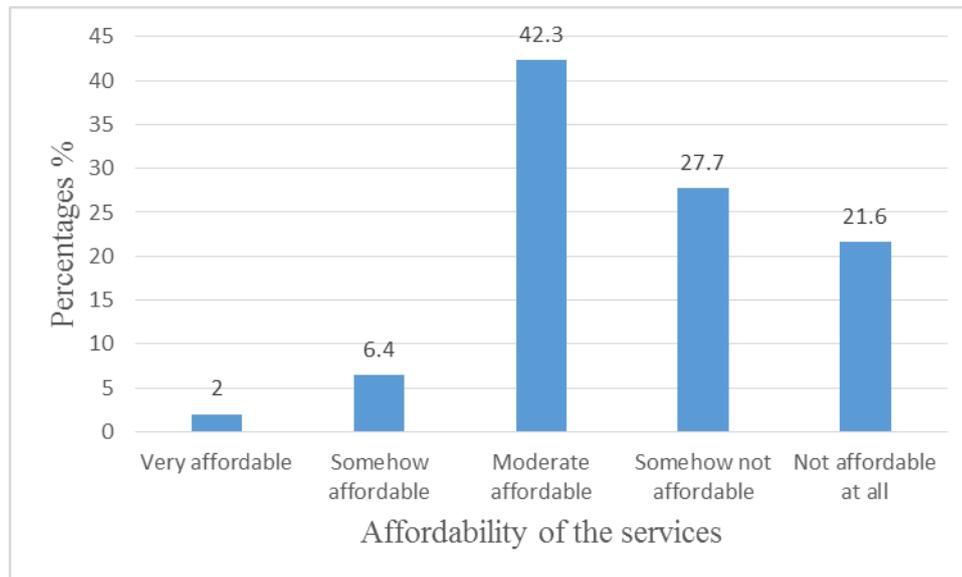


Figure 10: General overview of affordability of eye health services.

Patients were given a chance to rate the affordability of the eye services they get from referral hospitals. Majority of the patients (92%) rated the affordability of eye services from moderate to very difficult. This show that the affordability of eye services in the referral hospitals is difficult.

4.4 Barriers to utilization of eye health services in tertiary hospitals

The study revealed that out of 357 participants, 177 (49.3%) of the study participants declared that eye services affordability was difficult. This was expressed as barrier for the patients by the HCWs who also pointed out there are situations where one cannot afford to pay out of pocket for the services.

“Sometimes patients do not have consultation fee and do not have Health insurance” (Respondent 9).

In that situation, they may get what is close to the prescribed treatment regimen and not the exact one due to unmet expenses.

“Sometimes patient’s health insurance card (NHIF) does not pay for certain medication or spectacles hence they are given an equivalent but not the best medicine prescribed by the doctor”. (Respondent 7)

In some cases, exemption may be granted however, the process may take long and does not guarantee that the patient will be exempted.

“There is an exemption for patients who cannot afford to pay for services in the National Hospital, but this requires following a procedure and does not guarantee that the exemption will be given the same day the patient came for treatment. This may require the patient to visit the hospital more than once for that particular eye problem”.

(Respondent 3)

Overall availability of the eye care services was rated difficult by 43.7% (n=156) of the participants. HCWs explained the difficulties that related to access to specialists. Due to a limited number they may be unavailable depending on an emergency or need that has risen prior to the clinic. This increases the waiting hours before being attended as concluded by respondent 8:

“Sometimes the specialist is not around hence patients don’t get the service and are requested to come next time”. (Respondent 8)

CHAPTER FIVE

5.0 DISCUSSION

The overall objective of this study was to assess accessibility and utilization of eye health services in tertiary hospitals in Dar es Salaam. The study found that availability, affordability and accessibility are some of the factors which influence utilization of eye Health services. Out of 357 participants 177(49.3%) declared that eye services affordability was difficult, (156) 43.7% of the study participants rated the overall availability of eye health services including HReH waiting hours and medicine as difficult.

Transport time and waiting time was averagely longer than treatment time in both Muhimbili National Hospital and CCBRT Hospital. Average transport time to MNH was 397minutes; waiting time was 255.10 minutes and average time taken in the Doctor's room 28.51 minutes. Patients who visited CCBRT hospital had a longer travel time (458 minutes) average waiting time was shorter (141.13minutes) and time spent in the Doctor's room was 24.53 minutes. Average transport time was different from study participants who from Dar es salaam (109 minutes) and those who came from other Regions (1025).

5.1 Availability of eye health services among eye patients in tertiary hospitals

The study found that availability of services influence utilization of eye health services. MNH and CCBRT hospital strive to promote availability of eye health service and prevention of avoidable blindness and visual impairment. However, they still face challenges in their struggle to promote eye health for all.

This study revealed that majority (82%) of those who sought eye services in low level health facilities came to seek the same services in the tertiary hospitals due to unavailability of adequate services. Scarcity of eye care services has also been reported in the rural areas of many developing countries such as Jamaica, Latin America and the Caribbean, South Africa, Nigeria and India (Ntsoane et al., 2012). The review which included studies from rural settings indicated that services are available but not adequate, particularly inadequate HReH and equipment to meet the total number of patients who come for treatment in these tertiary hospitals. Even though this study was done in tertiary

hospital it revealed that most of those coming faced limited services in the primary and lower service levels. The tertiary facilities also have shortage of staff and equipment which impacts availability of services. Availability and acceptability of services and the attractiveness of the value gained by using available health facilities are among the factors which influence the utilization of health facilities (Bolutife et al 2016). The quest to promote eye health services availability and prevention of avoidable blindness and visual impairment have been emphasized by the global eye health action plan through integrating eye care programs into the wider health care system at all levels i.e. primary, secondary, and tertiary (WHO, 2019).

5.2 Human Resource for Eye Health

Findings of this study revealed that HReH is inadequate and to a great extent affects availability of eye health services. Tertiary hospitals are not expected to have scarcity of specialists. Similarly, scarcity of HReH reported by Palmer et al show a ratio of 2.9 ophthalmologists and cataract surgeons per 1million population in Sub Saharan countries (Palmer et al. 2014). Another study also reported a ratio of ophthalmic nurse 1:35,000 population (Adepoju et al 2011). When it comes to ratio of HReH, developed countries are doing better. In Europe, for instance Germany, United Kingdom and France, eye health services are comprehensively and exclusively integrated in health care system and the ratio of HReH to eye patients is realistic (Thomas et al., 2011). Eye health services in the tertiary hospitals are still burdened by lack of specialists. This results to delays in getting required services and sometimes a barrier in receiving services on time as patients are required to return another time

5.3 Training of HReH

The study revealed that there is continual training every week for re-fresher training on trends and issues of new eye related problems. Some of the trainings take place out of workplace example HReH going to KCMC for 3 months, going to India and Nairobi for specific eye training courses.

Fellowships training with United Kingdom (UK) partners are done in CCBRT to improve the services by sending staff for learning. Continuous medical education and symposium

are done weekly; there are also monthly clinical meetings. These findings are similar to study by (Thomas et al. 2011) which revealed that Eye health services in European country like France and Germany are exclusively provided by three different categories of professionals namely ophthalmologists, orthoptists and opticians. On top of these categories, all paramedics HReH are trained with primary eye health care, thus even at the time of emergency eye patients will receive primary eye health care while waiting to see specialist (Thomas et al., 2011).

In 2014, International Agency for the Prevention of Blindness (IAPB) conducted the study on crisis of eye healthcare workforce in sub-Saharan Africa countries and it was revealed that there is catastrophic shortage of specialist on the eye health sector. Our study however did not find cataract surgery specialists as a challenge. Instead, issues like Cancers related to the eye and patients requiring Surgical VIS –Surgical retina problems were mentioned as still challenging due to lack of enough specialists. Again, similar view was revealed in Kenya and Malawi, were the eye health sector lack competent eye HReH to provide eye health services to communities (Kalua et al., 2014).

Several interventions have been put forward by the government of Tanzania and private organizations to integrate primary eye health in health system through training of primary HReH to diagnose and manage the less serious but common eye conditions (Jolley et al., 2017; Mrisho et al, 2014).

5.4 Eye health equipment and medicine

Availability of well-functioning equipment and medicines also play significant role to ensure that eye health services are provided to people in need. The health facility might have HReH who are ready to provide the services to people but without the equipment and medicine procedures for eye test and treatment becomes impossible making the services to be limited.

The study findings revealed that although eye equipment is available they are not adequate to meet the number of people who come for services in the tertiary hospital. Equipment for eye health are very expensive and the government has little budget allocated for eye equipment and medicine, this becomes challenging to Muhimbili National Hospital which

is quite different from CCBRT Hospital who manage to buy and maintain the equipment through support from donors.

The study conducted in Zambia showed that, majority of health facilities lack equipment particularly spectacles; cataract sets; trial lenses and frames. Whereas, the most common reasons for equipment being out of order are the absence of maintenance technicians and, especially in the case of donations, the absence of trained personnel able to assemble and operate it. Lack of trained personnel able to assemble and operate some eye equipment was also reported in our study. Most of health facilities which are under government tends to lack equipment and medicine to support the access of eye health services (Bozzani and Griffiths, 2011). It has been revealed that there is a limited eye health infrastructure particularly at the district and regional level, ophthalmological equipment lack in most regional and district hospitals which are under government ownership in Tanzania (Mwakyusa et al., 2017). This is not the case with MNH and CCBRT where they have most essential of equipment required in tertiary hospital but the challenge they face is that the equipment is not enough to meet the number of patients who come for service hence this may result to delays while waiting for treatment.

5.5 Affordability of eye health services among patients in tertiary hospitals

Income levels and cost of the services influence affordability of eye care services. This includes affordability to pay for transport, to contribute to health insurance and ability to top up out of pocket when insurance doesn't cover for certain services. More than 30% of study participants cannot afford to pay out of pocket or top up for services not covered by the insurance. Affordability of services is still a challenge to patients attending the tertiary hospitals in Dar es Salaam, the findings are similar to those of (Robin et al 2004) who revealed in his study that income levels greatly influence affordability of eye care services in both the developing and developed nations. Even though this study did not ask rigorously for income but rather relied on the reported monthly income, the cost of services surpasses the reported income for many.

WHO reported that many people result in low vision and blindness, from conditions that could have been treated at an early stage, due to poverty which affects many rural areas of the world (WHO 2000).

5.6 Barriers to utilization of eye health services in tertiary hospitals

Understanding barriers of eye health services utilization is very crucial for planning strategies to prevent blindness. The findings of our study revealed that majority (82.9%) of patients who visit tertiary hospital reported to have some form of formal schooling (Primary school to University level qualification) hence they had an understanding on the importance of eye health. They were very willing to seek and receive the services however, the main challenge was affordability, proximity (time taken to travel, wait and received treatment) and availability of enough specialists.

The study revealed that 49.3% of the study participants declared that eye services affordability was difficult. Forty three percent of the study participants rated the overall availability of eye health services including HReH, waiting hours and medicine as difficult.

Free access to essential medicines is a fundamental right. Governments should provide accessible and affordable medicines to people (Qais et al, 2018) but this can be challenging in most developing countries due to competing priorities in health care for example in Tanzania where eye health services receive limited financial resources to meet population needs (Mwakyusa et al 2017). The competing priorities affects MNH eye department since the hospital depends on government budget but not the case to CCBRT hospital which has donor support.

Delay in accessing appropriate specialist care following eye injury which occurs after first visiting a health facility is one of the barriers to accessing services (Al-Attas et al., 2010). This was also reported in our study as one of the barriers to utilization of services. Some patients arrived at tertiary hospitals with severe conditions and it was too late for available HReH and equipment to help. In Sub Saharan Africa, barriers to accessing eye care services are caused by limited engagement with communities, a shortage of appropriately skilled health personnel, and inadequate support from health systems and this result to unmet eye care needs (Du Toit et al., 2013). Studies in China, India and Peru revealed that

an insufficient number of eye care specialists created barriers to referrals and follow-ups (Ntsoane et al., 2012). This study also revealed insufficient number of eye care specialists and equipment at the primary level caused barriers to the referral chain of eye patients. Even when HReH and equipment are available when a patient visits the hospital too late it becomes a barrier in accessing services simply because nothing can be done to help the patient.

The study conducted by (Jaggernath et al., 2014) revealed that the burden of vision impairment is high in poor people. Similar view is from studies conducted in Nigeria and Kenya indicted that lack of funds was among barriers to seeking eye care services (Ndengwa et al 2005, Ebeigbe et al 2014). This is similar to our study where 43.1% have an average monthly income of less than 100,000 TZS and are expected to pay an average of 123,191 TZS for treatment. The average amount expected to pay is more than the average monthly income and the patient is expected to visit the tertiary hospital more than 4 times because they have a chronic eye problem which has lasted for more than a year. Financial constrain is hence a barrier which greatly affects utilization of eye health services

5.7 Methodological Limitation

The study required participants to be interviewed after treatment. Due to long waiting hours some participants refused to participate in the study and this prevented the researcher from reaching 100% of the sample size. The process encountered by patients especially during registration and medicine collection involved patients from all other departments and by the time the patient was done with medicine collection they are no longer ready to be interviewed because they are rushing to catch transport back home.

This study also relied on reported information from both in-depth interviews and questionnaires hence the information reported could be biased. The researcher however used both qualitative and quantitative methods to dig deeper and have wide information related to the study from both patients and HReH.

This study was done in hospital settings hence barriers at community were not assessed directly but indirectly through questions asked to study participants for reasons for referral and time spent since referral made.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Affordability, availability and patient waiting time are greatly linked to accessibility and utilization of eye health services. MNH and CCBRT strive to provide services to patients who visit however, long waiting hours and lengthy queue lead to some patients leaving without receiving treatment. Inadequate human resource for eye health was found to be a key issue that led to long waiting hours and hamper availability of services. Average cost of eye health services is above the average income for many hence affordability is an issue for most who pay out of pocket. Patients with health insurance have a better chance of affording the services than those without, however not all eye services are covered by insurance funds.

There is an exemption of services at MNH for patients who cannot afford to pay out of pocket and those who do not have health insurance. However, this process doesn't guarantee that the patient will receive services the day they came for treatment. This means services may be present but there is a barrier to utilizing available services due to lack of funds and logistics.

6.2 Recommendations

Tertiary hospitals can improve this by addressing these key issues when planning for eye health services

- Planning and fund allocation for eye care services in tertiary hospitals must address the barriers to eye health services perceived by the tertiary hospitals to increase the utilization of eye health services. Priority should be given to procuring eye equipment and increase outreach support for Muhimbili National Hospital.
- To reduce waiting time before seeing a doctor, tertiary hospitals may consider training, recruiting and retaining eye health workers, and improve patient's registration, payments and other logistics.

- Tertiary hospitals to utilize a system where patients can book their appointments online or through phone and are assured of availability of services at a specific time before they travel to the hospital, this is especially relevant for patients who come for follow up visits.
- Eye health services providers (MNH and CCBRT) should review insurance schemes services covered by insurers and develop a memorandum of understanding of eye health services covered at tertiary level.
- Primary health centres to be well equipped with well trained eye health workers, medicine and equipment to reduce travel time and costs to the tertiary hospitals.
- Health education on prevention of eye problems through continuous outreach programs should be strengthen, this could also be in line with awareness creation on availability of eye health services at the District and Regional level. This will help identify and refer patients soon so that they may not arrive at the tertiary hospital too late and unable to utilize the services.

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APPENDICES**Appendix 1: Consent Forms**

ENGLISH VERSION**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
DIRECTORATE OF RESEARCH AND PUBLICATIONS, MUHAS****INFORMED CONSENT FORM****ID-NO**

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Consent to Participate in a Study

Greetings!

My name is **Rebecca Kasika**, I am a student at Muhimbili University of Health and Allied Sciences pursuing Master of Public Health.

Purpose of the study

“Accessibility and utilization of eye health services in tertiary hospitals in Dar es salaam, Tanzania”

What Participation Involves

If you agree to join the study, you will be interviewed face to face with me in order to answer a series of questions in the questionnaire prepared for this study; this will take about 15 to 30 minutes for one interview.

Confidentiality

I assure you that all the information collected from you will be kept confidential. Your name will not be written on any questionnaire or in any report/documents that might let someone identify you. Confidentiality will be observed and unauthorized persons will have no access to the data collected. And the information collected during interview will be analyzed by using identification number. If, this study is published or presented at a scientific meeting, names and other information that might identify you will not be used.

Right to Withdraw and Alternatives

Taking part in this study is voluntary. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty.

Risk

No harm is anticipated to you because of participating in this study

Benefits

You will derive no direct benefit from participating in this study; however, the results of this study will provide valuable information regarding availability and affordability of eye health services in Tanzania.

In Case of Injury

We do not anticipate that any harm will occur to you.

Whom to contact

Thank you for taking time to read this information letter. If you have any question regarding this study you may contact **Rebecca Kasika**, mobile number; **0762061866**. In case you have questions regarding your rights as a participant, you may contact **Dr. Bruno Sunguya**, Director of research at MUHAS, P.O. Box 65001, Dar-es-Salaam,

mobile number +255685 217272 and **Dr. Gloria Sakwari**, mobile number +255767591202 from MUHAS who is supervising this study.

Signature:

Do you agree?

Participant agreesParticipant does NOT agree.....

I have read the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of participant

Signature of Research Assistant.....Date of signed consent.....

SWAHILI VERSION

**CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI
KURUGENZI YA UTAFITI NA UCHAPISHAJI**

FOMU YA RIDHAA

Namba ya Utambulisho

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Ridhaa ya kushiriki katika utafiti

Habari! Jina langu ni **Rebecca Kasika**, mwanafunzi katika Chuo Kikuu cha Tiba na Afya shirikishi Muhimbili, ninasoma shahada ya pili za uzamili katika fani ya afya ya jamii.

Dhumuni ya ushiri

Dhumuni la utafiti huu ni kutaka kufahamu upatikanaji na utumikaji wa huduma za afya ya macho katika hospitali za rufaa mkoa wa Dar es salaam.

Kushiriki kunahusisha nini?

Ukikubali kushiriki katika utafiti huu utahitajika kutumia muda wa dakika 15 mpaka 30 kwaajili ya kujibu maswali utakayoulizwa na mtafiti.

Usiri

Majibu yote yatakusanywa kutoka katika eneo la utafiti na yataingizwa kwenye compyuta kwakutumia namba ya utambulisho tu. Hakuna jina la mshiriki litakalochapishwa.

Haki ya Kutoka na Mbadala

Kushiriki katika utafiti huu ni uchaguzi wako, una uhuru wa kukubali au kukataa kushiriki katika utafiti huu. Pia unaweza kuacha kushiriki katika utafiti huu muda wowote utakapojisikia hivyo hata kama umeshakubali kushiriki. Kukataa kushiriki au kuacha kushiriki katika utafiti huu hakutakufanya upate adhabu.

Faida

Ukikubali kushiriki katika utafiti huu hakuna faida ya moja kwa moja utakayopata lakini tunaamini maelezo utakayoyotoa yatasaidia; Hata hivyo, matokeo ya utafiti huu yatatoa habari muhimu kuhusu unafuu na upatikanaji wa huduma za macho.

Madhara

Hatutegemei kwamba utapata madhara yoyote ya kimwili kwakushiriki katika utafiti huu

Mawasiliano

Kama utakuwa na swali lolote kuhusu utafiti huu unaweza kuwasiliana na mtafiti **Rebecca Kasika**, kwa namba ya simu; **0762061866**. Ukiwa na lolote kuhusu haki zako kama mshiriki, wasiliana na **Daktari Bruno Sunguya Masalu** ambaye ni Mwenyekiti wa Kamati ya Utafiti ya Chuo, S.L.P. 65001, Dar es Salaam. Simu: **+255685217272** na **Daktari Gloria Sakwari** kwa simu namba **+255767591202** ambaye ni msimaizi mkuu wa utafiti huu.

Sahihi

Je umekubali?

Mshirikia amekubali.....Mshiriki Hajakubali.....

Mimi.....nimesoma maelezo ya fomu hii. Maswali yangu yamejibiwa. Nimekubali kushiriki katika utafiti huu.

Sahihi ya mshiriki.....

Sahihi ya shahidi (kama mshiriki hawezi kusoma)

Sahihi ya mtafiti.....

Tarehe ya ukubali wakushiriki.....

Tarehe_____

Appendix 2: Questionnaire For Eye Patients

ENGLISH VERSION

INTRODUCTION		
001	Questionnaire number	<input type="text"/> <input type="text"/> <input type="text"/>
002	Date of the interview	Date: dd/mm/yyyy
003	Name of the hospital	1.Muhimbili National Hospital 2.CCBRT
	Name/ ID of the Data Collector	
SOCIAL DEMOGRAPHICS CHARACTERISTICS OF PATIENT		
101	Sex of respondent	1.Male 2.Female
102	How old are you?	Mention Date of birth _____ For missing date 01/01/of the year will be used
103	What is the highest level of education you have completed?	1.No formal education 2.Primary 3.Secondary 4.College 5.University
104	Where are you current living	1.Kinondoni MC 2.Ilala MC 3.Another district found in Dar es salaam 4.Another district outside Dar es salaam 5.Name it _____ Region _____
105	What is your primary source of income?	1.No employment 2.Employed by government 3.Employed by private sector 4.Businessman/business woman

		<p>5.Farmer</p> <p>6.Wages</p> <p>7.Retiree</p> <p>8.Still a student</p> <p>9.Others, please mention</p>
106	What is your average monthly income?	<p>1.Below 100,000 TZS</p> <p>2.100,000 to 200,000 TZS</p> <p>3.200,000 to 500,000 TZS</p> <p>4.500,000 to 1,000,000 TZS</p> <p>5.1,000,000 to 1,500,000 TZS</p> <p>6.Above 1,500,000 TZS</p>
107	How much did you spend on transport to this hospital	<p>1.Below 1000 TZS</p> <p>2.1,000 to 10,000 TZS</p> <p>3.10,000 to 20,000 TZS</p> <p>4.20,000 to 50,000 TZS</p> <p>5.Above 50,000 TZS</p> <p>6.Others</p> <p>Specify _____</p>
108	<p>How long did it take you to get to this health facility? INDICATE TIME IN MINUTES</p> <p>NOTE: Check question 104 if respondent is coming from another district out of Dar es salaam please indicate number of days spent?</p>	<p>MINUTES: _____</p> <p>DAYS: _____</p>
EYE HEALTH PROBLEM		
201	What is the main eye problem that you are facing?	Please mention: _____
202	For how long have you been suffering with problem before seeking medical care?	<p>1.Between 1 to 7 days</p> <p>2.Past one month</p>

		3. Within 6 months 4. Within this year 5. Over the past year 6. I don't remember
203	When was it diagnosed by the doctor/ in hospital	1. Today 2. Within 1 week 3. Within 2 weeks 4. Within 4 weeks 5. Over 1 month 6. Over a year 7. I don't remember
204	What is the cause of the mentioned eye problem?	Please mention: _____
AVAILABILITY OF EYE HEALTH SERVICES		
301	Apart from this visit, have you ever sought eye healthcare service for the mentioned eye problem?	1. Yes 2. No
301a	If q301 is YES, where did you seek that eye health services?	1. Home-made medicine 2. Traditional healer 3. Pharmacy (bought medicine) 4. Local eye clinic 5. Health facility i.e. dispensary, HC, hospitals 6. Others please specify _____ -
301b	If q301 is NO, what was the main reason?	1. No nearby health facility 2. No eye specialist 3. High expense of eye health services 4. Others please specify _____
302	How many times have you attended in this	3. This is the first time

	health facility?	<p>4.2nd visit</p> <p>5.3rd visit</p> <p>6.4th visit</p> <p>7.More than five visits.</p>
303a	<p>How much time (in minutes) did you spent before seeing doctor?</p> <p>Time of arrival to the hospital may be asked or check on the number/ token given</p>	Minutes: _____
303b	<p>How much time (in minutes) did you spent for eye health services?</p> <p>Note the time that patient received medication and was ready to exit</p>	Minutes: _____
304	If q302 is more than one visit mention the reason for the other visits?	<p>1.Follow up visit</p> <p>2.Medicines were not available</p> <p>3.Glasses were not available</p> <p>4.Eye specialist was not available</p> <p>5.Long queue of eye patients</p> <p>6.Others please specify</p> <p>_____</p>
305	<p>How did you come to know this hospital provide eye health services?</p> <p>MULTIPLE RESPONSE</p>	<p>1.Referred from another health facility</p> <p>2.Family/friend/relative</p> <p>3.Radio/TV/newspaper</p> <p>4.Others please specify</p> <p>_____</p>
306	If q305 is referral what was the name, type and location of the first health facility that you visited?	<p>Name: _____</p> <p>Type: _____</p> <p>Location: _____</p>

307	What was the reason for referral? MULTIPLE RESPONSE	<ol style="list-style-type: none"> 1.Lack of specialist for my problem 2.Lack of equipment 3.Lack of medicine 4.Other please specify _____
308	How long did you spent at the first health facility before getting the referral?	Number of days: _____
309	If referral took more than 3 days, what were the reasons for delay, please mention?	Reasons for delay: _____
310	How do you rate, the overall availability of eye health services including HCW, waiting hours, medicine, and equipment	<ol style="list-style-type: none"> 1.Very easily 2.Somewhat easily 3.Moderate 4.Somewhat difficult 5.Very difficult
AFFORDABILITY OF EYE HEALTH SERVICES		
401	Do you have health insurance card?	<ol style="list-style-type: none"> 1.Yes 2.No
402	What is the name of provider for your health insurance card?	Name: _____
403	Does your insurance card cover for eye services	<ol style="list-style-type: none"> 1.Yes 2.No 3.I don't know/No response
404	If q403 is YES, what parts of eye health services does the health insurance cover? MULTIPLE RESPONSE	<ol style="list-style-type: none"> 1.Checkup only 2.Treatment including medicine 3.Treatment including glasses 4.Surgeon 5.Others please specify
405	If you don't have health insurance or your current health insurance does not cover for eye health services. How much do you	TZSH _____

	expect to pay for this service?	
406	Did your problem require you to purchase glasses? If YES, how much did you or expect to pay for glasses:	TZSH _____
407	How do you rate, the overall affordability of eye health services including cost for treatment, medicine, and equipment?	1. Very affordable 2. Somehow affordable 3. Moderate affordable 4. Somehow not affordable 5. Not affordable at all

LEVEL OF SATISFACTION WITH EYE HEALTH SERVICES

501	Satisfactions of eye health services Please tick the correct response per each attribute	High satisfied	Moderate satisfied	Satisfied	Dissatisfied	Moderate dissatisfied	Highly dissatisfied
501a	Waiting hours before eye test						
501b	Number of eye HCW available						
501c	Politeness and friendliness of eye HCW						
501d	Eye testing and medication						
501e	Treatment and advice provided						
501f	Cost and payment procedures						

COMMENTS

600	Do you have any comment for future improve of eye health service?	
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DODOSO LA WAGONJWA WA MACHO

SWAHILI VERSION

SEHEMU YA 1: UTANGULIZI		
001	Namba ya dodoso	<input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/> <input style="width: 30px; height: 20px; border: 1px solid black;" type="text"/>
002	Tarehe ya mahojiano	Tarehe: ss/mm/mmmm
003	Jina la hospitali	1.Muhimbili National Hospital 2.CCBRT
TAARIFA ZA MGONJWA		
101	Jinsi ya mhojiwa	1.Me 2.Ke
102	Je umri wako ni upi?	Taja umri katika miaka _____
103	Je kipi ni kiwango chako cha elimu ulichofikia?	1.Sina elimu rasmi 2.Elimu ya msingi 3.Elimu ya sekondari 4.Chuo cha ufundi stadi 5.Chuo kikuu
104	Je kwa sasa unaishi wapi?	1.Kinondoni MC 2.Ilala MC 3.Wilaya nyingine ndani ya Dar es salaam 4.Wilaya nyingine nje ya Dar es salaam
105	Je kipi ni chanzo chako kikuu cha kipato?	1.Sina ajira 2.Nimeajiriwa serikalini 3.Nimeajiriwa sekta binafsi 4.Mfanyabiashara 5.Mkulima 6.Kibarua 7.Bado mwanafunzi 8.Nyingine, tafadhali taja
106	Je, kwa wastani unapata kipato kiasi gani kwa mwezi?	1.Chini ya 100,000 TZSH 2.10,000 hadi 200,000 TZSH 3.200,000 hadi 500,000 TZSH 4.500,000 hadi 1,000,000 TZSH 5.1,000,000 hadi 1,500,000 TZSH 6.Zaidi ya 1,500,000 TZSH
107	Na ni kiasi gani ambacho umetumia kuja katika kituo hiki cha afya?	1.Chini ya 1,000 TZSH 2.1,000 hadi 10,000 TZSH 3.10,000 hadi 20,000 TZSH 4.20,000 hadi 50,000 TZSH

		5.Zaidi ya 50,000 TZSH
108	Je umetumia muda gani kufika kwenye kituo cha afya? MUDA KATIKA DAKIKA ANGALIZO: Rejea swali la 104, Kama mhojiwa anatokea nje ya mkoa wa Dar es salaam taja idadi ya siku?	DAKIKA: _____ SIKU: _____
UGONJWA WA MACHO		
201	Je tatizo kubwa linalokusumbua kwenye macho ni lipi?	Tafadhali taja: _____
202	Ni kwa muda gani tatizo hilo limekuwa likukusumbua?	1.Kati ya siku 1 hadi 7 2.Mwezi mmoja uliopita 3.Ndani ya miezi 6 4.Ndani ya mwaka huu 5.Zaidi ya mwaka mmoja 6.Sikumbuki
203	Ni muda gani tatizo lako liligunduliwa/fanyiwa uchunguzi na daktarin hospitalini hapa?	1.Leo 2.Ndani ya wiki moja 3.Ndani ya wiki mbili 4. Nandi ya wiki nne 5.Zaidi ya mwezi mmoja 6.Zaidi ya mwaka mmoja 7.Sikumbuki
204	Kipi chanzo cha tatizo hilo?	Tafadhali taja: _____
UPATIKANAJI WA HUDUMA NA MATIBABU YA AFYA YA MACHO		
301	Mbali na ziara hii, umewahi kutafuta huduma ya afya ya macho kwa tatizo hili ulilonalo?	1.Ndio 2.Hapana
301a	Kama q301 ni NDIO, je ni wapi ulipata huduma ya afya ya macho?	1.Mitishamba 2.Mganga wa kienyeji 3.Duka la dawa (nilinunua) 4.Klikiki ndogo ya macho 5.Kituo cha afya kama zahanati, kituo cha afya na hospitali 6.Nyingine, tafadhali eleza
301b	Kama q301 ni HAPANA, sababu kuu ilikuwa ni ipi?	1.Hakuna kituo cha afya jirani 2.Hakuna madaktari bingwa wa macho 3.Gharama kubwa za huduma ya macho 4.Nyingine, tafadhali eleza
302	Ni kwa mara ngapi umepata huduma	1.Hii ni mara yangu ya kwanza

	kwenye kituo hiki cha afya?	<ol style="list-style-type: none"> 2.Hudhurio la pili 3.Hudhurio la tatu 4.Hudhurio la nne 5.Zaidi ya mahudhurio matano
303a	Je, umetumia muda gani (katika dakika) kabla ya kuomuona daktari?	Dakika: _____
303b	Je, umetumia muda gani (katika dakika) kupata huduma ya afya ya macho?	Dakika: _____
304	Kama q302 ni zaidi ya ziara moja, taja sababu ya ziara zilizopita?	<ol style="list-style-type: none"> 1.Ufuatiliaji wa udhurio la mwisho 2.Dawa hazikuwepo 3.Miwani haikuwepo 4.Mtaalamu wa macho hakuwepo Idadi kubwa ya wagonjwa 5.Nyingine, tafadhali eleza
305	Je, ulijuaje hii hospitali inatoa huduma ya afya ya macho? JIBU ZAIDI YA MOJA	<ol style="list-style-type: none"> 1.Rufaa kutoka kituo kingine cha afya 2.Familia/Rafiki/ndugu 3.Redio/Luninga/magazeti 4.Nyingine, tafadhali eleza
306	Kama q305, jibu ni RUFAA. Taja, jina, aina na sehemu ya kituo cha afya kilichokupa rufaa?	Jina: _____ Aina: _____ Sehemu: _____
307	Zipi zilikuwa sababu za rufaa? JIBU ZAIDI YA MOJA	<ol style="list-style-type: none"> 1.Ukosefu wa wataalamu 2.Ukosefu wa vifaa tiba 3.Ukosefu wa dawa 4.Nyingine, tafadhali eleza
308	Je ilichukua siku ngapi kabla ya kupata rufaa?	Idadi ya siku: _____
309	Kama ni zaidi ya siku 3, ipi ilikuwa sababu ya kuchelewa rufaa?	Sababu ya kuchelewa: _____
310	Je, unakadiliaje upatikanaji wa huduma na matibabu ya macho kwa ujumla, kwa kuzingatia uwepo wa wahudumu wa afya, muda wa kupata huduma, na vifaa tiba?	<ol style="list-style-type: none"> 6.Rahisi sana 7.Rahisi kawaidi 8.Kawaida 9.Si rahisi kiasi 10.Si rahisi kabisa
UNAFUU WA MATIBABU YA MACHO		
401	Je, unakadi ya bima ya afya?	<ol style="list-style-type: none"> 1.Ndiyo 2.Hapana
402	Ni jina gani la shirika la kadi yako ya bima ya afya?	JINA: _____
403	Je, kadi yako ya bima ya afya	1.Ndiyo

	inagharamikia matibabu ya afya ya macho?	2.Hapana 3.Sijui/Hakuna jibu
404	Kama swali 403, ni NDIYO. Je, matibabu gani yanagharamiwa na bima ya afya? JIBU ZAIDI YA MOJA	1.Uchunguzi pekee 2.Matibabu pamoja na dawa 3.Matibabu pamoja na miwani ya macho 4.Upasuaji 5.Nyingine, tafadhali eleza
405	Kama hauna kadi ya bima ya afya au bima uliyonayo haigharamiki matibabu ya macho. Je, ni kiasi gani cha fedha unatazamia kulipia matibabu?	TZSH _____
406	Je, tatizo lako la macho lilihitaji ununuzi wa miwani ya macho? Kama NDIYO, ni kiasi gani cha fedha ulilipia au unatazamia kulipa kwa miwani?	1.Ndiyo 2.Hapana TZSH _____
407	Je, unakadiliaje unafuu wa huduma na matibabu ya macho kwa ujumla, kwa kuzingatia gharama, matibabu, dawa na vifaa tiba?	6.Nafuu sana 7.Nafuu kiasi 8.Kawaida 9.Si nafuu kiasi 10.Si nafuu kabisa

KIWANGO CHA ULIRIDHIKAJI NA HUDUMA ZA AFYA YA MACHO

501	Satisfactions of eye health services Please tick the correct response per each attribute	Nimeri dhika sana	Nimeri dhika kiasi	Nimeri dhika	Sjarid hika	Sjarid hika kiasi	Sjarid hika sana
501a	Muda uliotumia kusubiria kabla ya kupima macho?						
501b	Idadi ya wahudumu wa afya ya macho						
501c	Ukarimu na upole wa wahudumu wa afya ya macho						
501d	Upimaji wa macho na matibabu						
501e	Matibabu na ushauri uliotolewa						
501f	Gharama za matibabu						

MAONI

600	Je una maoni yoyote juu ya uboreshaji wa huduma za afya ya macho kwa hapo baadae?	
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Appendix 3: Checklist

NOTE: This checklist is intentionally left not translated to Swahili version since English is the official language used by Healthcare Workers (HCW) to document health facility medicine and equipment

INTRODUCTION		
101	Name of hospital	1.Muhimbili National hospital 2.CCBRT
102	Date of observation/data abstraction	
103	Name of HCW who fill the checklist	
104	Position of HCW in hospital	
FACILITY SERVICES MODULE		
201	How many hours per day does this facility operates?	Number of hours:
202	At what time does this facility open and closed?	Open hours: Close hours:
203	How many days per week does this facility open?	Days:
204	How many days per week are eye health services provided?	Days:
205	How many eye patients visit did you record last month?	Male:

		Female:		
206	How many times during the last 6 months did facility receive supportive supervision on eye health services?	Total visits:		
NUMBER OF EYE HEALTHCARE WORKERS				
	CATEGORY OF EYE HCW	MALE	FEMALE	TOTAL
301	Optometrist			
302	Ophthalmic Nursing Officer			
303	Ophthalmology (Assistant medical officer)			
304	Ophthalmic and optometric assistants			
305	General nurse			
306	Vision therapists			
307	Ophthalmic photographers and imagers			
308	Ophthalmic administrators			
309	Ocularists			
EQUIPMENT AND SUPPLIES MODULE				
	NAME OF EQUIPMENT Please tick the appropriate column in response	Available and in use	Available but not in use	Out of stock

401	Rooms available for eye OPDS services			
402	Rooms available for optical workshop			
403	Rooms available for eye theatre			
404	Visual acuity chart/Reading chart(Snellen)			
405	Slit lamp with applanation tonometer			
406	Slit lamp without applanation tonometer			
407	Applanation tonometer			
408	Pulse air tonometer			
409	Schiortz tonometer			
410	Direct Ophthalmoscope			
411	Indirect Ophthalmoscope			
412	Torches			
413	Near VA chart			
414	VA drums(Illuminated)			
415	Self-illuminating VA box			
416	Condensing examination lenses (90 D/78D lenses)			

417	Gonioscopy lens			
418	Prism bar			
419	Prism (Loose set)			
420	Head/Magnifying operating loupes			
421	A scan			
422	Keratometer			
423	Retinoscope			
424	Trial sets			
425	Trial frame			
426	Optical frame display			
427	Cross Cylinder			
428	Operating Microscopes			
429	Portable sterilizer (180 degrees)			
430	Portable autoclave			
431	Sterilizer			
432	Cataract set			

433	Minor surgical sets			
434	Bilamellar tarsal Rotation procedure set			
435	Chalazion set			
436	Bipolar cautery			
437	Spirit Lamp			
438	Vitreotomy machine			
439	Lensometer			
440	Frame heater			
441	Chipping pliers			
442	Grinding machine			
431	Grooving machine			
443	Glass cutter			
444	Lens edger machine			
445	Trinting color pot unit			
446	Pattern maker machine			

AVAILABILITY OF EYE DRUGS MODULE			
501	List of essential medicines, medical products and technologies for eye care issued by the Ministry of Health		1=Yes 2=No
	<p>If “Yes”, is there supporting government policy to ensure rational use of the essential medicines, medical products and technologies?</p> <p>If “No”, do other government institutions in the country have information on essential medicines for eye care?</p>		
502	Updating of the list of essential medicines, medical products and technologies for eye care		1=Yes 2=No
503	Is the list of essential medicines for eye care used to improve universal provision of eye care services?		1=Yes 2=No
504	I. The medicines on the list must be available in eye care provider establishments and in pharmacies at all times.		1=Yes 2=No

	<p>II. The eye care medicines on the list are provided by pharmacies free of charge to patients with a physician's prescription.</p> <p>III. The eye care medicines on the list are provided free of charge to patients during hospitalization.</p> <p>IV. The eye care medicines on the list are not provided for free, but the medicines are fully reimbursed for patients with health insurance.</p> <p>V. The eye care medicines on the list are paid by patients.</p> <p>Other (specify):</p>	
--	--	--

NUMBER OF EYE PATIENTS RECORDS MODULE

	TYPE OF EYE PROBLEM	MALE					FEMALE				
		U5	6-13	14-24	25-49	50+	U5	6-13	14-24	25-49	50+
601	Cataract										
602	Glaucoma										
603	Refractive error										
604	Diabetes mellitus and diabetic retinopathy										
605	Age-related macular degeneration										

606	Retinopathy of prematurity										
607	Cancer										
608	Squint										
609	Injuries										
BUDGET FOR EYE HEALTH SERVICE											
700	What is the ESTIMATED total budget of this health facility for the last year?	Total budget: _____ TZS									
701	What is the ESTIMATED budget allocated for Human Resource for eye Health?	Total budget: _____ TZS									
702	What is the ESTIMATED budget allocated for medicine and equipment for eye health services?	Total budget: _____ TZS									
COMMENTS											
800											

Appendix 4: In-Depth Interview Guide For Eye Healthcare Worker

ENGLISH VERSION

PART 1: INTRODUCTION

Date of interview: _____

Name of hospital: _____

Name of interview: _____

Gender: _____

Age: _____

Profession: _____

Years of experience: _____

PART 2: KNOWLEDGE OF EYE HEALTH SERVICES

- 1.What are eye health services?
- 2.What are the common eye problems that most eye patients have in your hospital?
Probe: the reasons for such eye related problems
- 3.How do you record and keep report for eye health data in your hospital? *Probe: different category of Eye health data i.e. number of HCW, equipment's, medicine and patients' records.*
- 4.How do they handle the cases do they sort the for various speciality? *Do they send them to one Dr who will the say where they should go?*

PART 3: AVAILABILITY AND AFFORDABILITY TO EYE HEALTH SERVICES

1. Do you know where most of your eye health patients come from? Probe: those who come directly to the hospital and those who are being referred from other health facilities?
2. What are pulling factors for eye patients to attend your hospital? Probe: capacity of hospital in terms of ratio of HCW, availability of technologies, equipment and medicine to treat eye patients.
3. Do you think that your eye health services are affordable to low class people? Probe: If YES how, and if NO why?
4. Do you take health insurance card for eye health services? *Probe: categories of health insurance applicable to hospital and what services are included or covered by health insurance?*
5. Have you ever experience lack of HCW, equipment or medicine which lead to eye patient to miss treatment? *Probe: If YES, what did you do to ensure that the patient receive the services in future?*
6. Do you conduct any out-reach services for eye health? *Probe: If YES, how often, what locations, who are targeted population and what services are covered?*
7. Do you have any strategies to improve human resources for eye health care and services? Probe: recruiting and retention procedures, capacity building and trainings.

PART 4: CHALLENGES AND RECOMMENDATION

1. Do you have any challenges managing the patients referred to you with your current skills?
2. What other suggestions do you have on availability, affordability and accessibility of eye health services?

THANK YOU FOR TAKING THE TIME TO ANSWER QUESTIONS.

SWAHLI VERSION**SEHEMU YA 1: UTANGULIZI**

Tarehe: _____

Jina la hospitali: _____

Jina la mhojiwa: _____

Jinsi: _____

Umri: _____

Kada: _____

Miaka ya uzoefu: _____

SEHEMU YA 2: UFAHAMU JUU YA HUDUMA ZA AFYA YA MACHO

1. Je, huduma za afya ya macho ni zipi?
2. Je yapi ni matatizo makuu ya macho ambayo wagonjwa wengi wanakuwa nayo katika hospitali hii? *Dadisi: chanzo cha matatizo tajwa*
3. Ni kwa namna gani mnarekodi na kuripoti takwimu za afya ya macho? *Dadisi: kada tofauti za wauguzi wa afya ya macho, vifaa tiba, dawa na taarifa za wagonjwa*

SEHEMU YA 3: UPATIKANAJI NA UNAFUU WA HUDUMA ZA MACHO

1. Je, unajua sehemu/eneo ambalo wagonjwa wengi wa macho wanatoka? *Dadisi: Wagonjwa wanakuja hospitalini moja kwa moja na wale wanaopewa rufaa kutoka vituo vingine vya afya?*
2. Ni sababu gani ambazo uwavuta wagonjwa wa macho kuja katika hospitali hii? *Dadisi: uwezo wa hospitali kwa kuangalia wastani wa wauguzi wa macho, uwepo wa teknolojia, vifaa tiba na dawa za matibabu ya macho?*
3. Je unafikiria gharama za matibabu ya macho katika hospitali hii ni nafuu kwa watu wa kipato cha chini? *Dadisi: Kama NDIYO, je ni kwanini unawaza hivyo, na Kama ni HAPANA, je ni kwanini?*

4. Je mnapokea bima za afya kwa matibabu ya macho? *Dadisi: aina za kadi ya bima zinazopelelewa na hosipitali na aina ya huduma zinazogharamiwa na bima ya afya?*
5. Je kituo hiki kimewahi kukumbwa na upungufu wa wauguzi, vifaa tiba au dawa ambazo zikapeleleka kukosekana kwa huduma za afya ya macho? *Dadisi: Kama NDIYO, ni hatua zipi zinalizochukuliwa kuhakikisha wagonjwa wanapata huduma kwa baadae?*
6. Je mnatoa huduma za afya ya macho nje ya kituo? *Dadisi: Kama NDIYO, ni kwa mara ngapi, ni maeneo gani, na makundi lengwa ni yapi?*
7. Je, mkakati wowote wa kuboresha rasirimali watu wa huduma za afya ya macho? *Dadisi: mchakato wa ajira na kuwabakisha wauuguzi waliopo, mafunzo ya kuongeza ujuzi.*

SEHEMU YA 4: CHANGAMOTO NA MAPENDEKEZO

1. Je ni changamoto zipi mnakutanazo kipindi cha kutoa huduma kwa kuzingatia uwezo wenu wa sasa?
2. Una mapendekezo gani juu ya upatikanaji, unafuu na uwepo wa huduma za afya ya macho?

Appendix 5: Interview Guide For Small Group Discussions

ENGLISH VERSION

PART 1: INTRODCUTION

Date of interview: _____

Name of hospital: _____

	Name of participating	Gender	Age	Department	Profession	Years of experience
1						
2						
3						
4						
5						

PART 2: KNOWLEDGE OF EYE HEALTH SERVICES

1. What are eye health services?
2. What are the common eye problems that most eye patients have in your hospital?

Probe: the reasons for such eye related problems

PART 3: AVAILABILITY AND AFFORDABILITY OF EYE HEALTH SERVICES

1. In your opinion how do you rate eye health services at your facility? Probe: What is your perception on eye health services provided in other health facilities in the country?
2. Do you think eye health services are easily accessible to all people? Probe 1: If YES, how and why. Probe 2: if NO how and why?
3. Does your facility have all basic equipment and/or medicine needed for eye health services? Probe: if YES, are they all in use, and IF some are not in use probe the reason for such situation.
4. Have you ever received eye patient and fail to treat them due to lack of equipment and/or medicine? Probe: If YES, what did you do? And what do you suggest for future improvement?
5. Have you ever received training or capacity building to improve your eye health skills? Probe 1: if YES, who attended such trainings, what were the types of trainings provided, when were they provided and by who? Probe 2: all other trained provided?
6. Have you ever fail to treat eye patient due to the lack of skills on eye health problem? Probe 1: if YES, what was the eye problem that you fail to address, and what did you do? Probe 2: future improve for that situation?

PART 4: CHALLENGES AND RECOMMENDATION

1. Do you have any challenges managing the patients referred to you with your current skills?
2. What other suggestions do you have on availability, affordability and accessibility of eye health services?

WE HAVE NOW REACHED THE END OF THE SURVEY. THANK YOU FOR TAKING THE TIME TO ANSWER QUESTIONS.

SWAHILI VERSION**SEHEMU YA 1: UTANGULIZI**

Tarehe: _____

Jina la hospitali: _____

	Jina la mshiriki	Jinsi	Umri	Idara	Kada	Miaka ya Uzoefu
1						
2						
3						
4						
5						

SEHEMU YA 2: UFAHAMU JUU YA HUDUMA ZA AFYA YA MACHO

1. Je, huduma za afya ya macho ni zipi?
2. Je yapi ni matatizo makuu ya macho ambayo wagonjwa wengi wanakuwa nayo katika hospitali hii? *Dadisi: chanzo cha matatizo tajwa*

SEHEMU YA 3: UPATIKANAJI NA UNAFUU WA HUDUMA ZA MACHO

1. Kwa maoni yako unaonaje huduma za afya ya macho katika kituo chako? *Dadisi: mtazamo wa huduma za afya ya macho zinazotolewa kwenye vituo vingine vya afya ndani ya nchi?*

2. Je unahisi huduma za afya ya macho zinapatikana kirahisi kwa watu wote? Dadisi 1: Kama NDIYO ni kwa namna gani na kwa nini? Dadisi 2: Kama HAPANA ni kwa namna gani na kwa nini?
3. Je kituo hiki cha afya kina vifaa tiba muhimu na dawa muhimu wa matibabu ya afay ya macho? Dadisi: Kama NDIYO je vinatumika na kama kuna vifaa tiba ambavyo havitumiki dadisi kwanini havitumiki?
4. Je kituo hiki kimewahi kupokea mgonjwa wa macho lakini hakashindwa kupewa huduma kwa sababu ya ukosefu wa vifaa tiba na/au dawa? Dadisi: Ulifanya kitu gani? Na unashauri nini kwa maboresho ya baadae?
5. Je umewahi kupokea au kupewa mafunzo ya kuongeza ujuzi juu ya huduma za afya ya macho? Dadisi 1: Kama NDIYO, ni watu gani walihudhuria, na yalikuwa mafunzo ya vitu gani, pia yalitolewa lini na ni nani alietoa? Dadisi 2: Mafunzo mengine yote aliyotolewa?
6. Je umeshawahi kushindwa kutoa huduma za afya ya macho kwa mgonjwa kwa sababu ya kukosa uwezo wa kutibu tatizo hilo? Dadisi 1: Kama NDIYO, lilikuwa tatizo gani ambalo ulishindwa kutibu na ulifanya nini? Dadisi 2: maboresho ya baadae ili tatizo ilo lisijekutokea tena?

SEHEMU YA 4: CHANGAMOTO NA MAPENDEKEZO

1. Je ni changamoto zipi mnakuta nazo kipindi cha kutoa huduma kwa kuzingatia uwezo wenu wa sasa?
2. Una mapendekezo gani juu ya upatikanaji, unafuu na uwepo wa huduma za afya ya macho?

Appendix 6 : Approval For Ethical Clearance

**MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR OF POSTGRADUATE STUDIES**

P.O. Box 65001
DAR ES SALAAM
TANZANIA
Web: www.muhas.ac.tz



Tel G/Line: +255-22-2150302/6 Ext. 1015
Direct Line: +255-22-2151378
Telefax: +255-22-2150465
E-mail: dpps@muhas.ac.tz

Ref. No. DA.287/298/01A/ 16th July, 2019

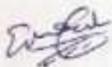
Ms. Rebecca Elias Kasika
MPH-Executive Track
MUHAS

**RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED:
"ACCESSIBILITY AND UTILIZATION OF EYE HEALTH SERVICES IN
TERTIARY HOSPITALS IN DAR ES SALAAM, TANZANIA"**

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from **15th July, 2019 to 14th July, 2020**. In case you do not complete data analysis and dissertation report writing by **14th July, 2020**, you will have to apply for renewal of ethical clearance prior to the expiry date.



Dr. Emmanuel Balandya
ACTING: DIRECTOR OF POSTGRADUATE STUDIES

cc: Director of Research and Publications
cc: Dean, School of Public Health and Social Sciences, MUHAS

Appendix 7: Permission to collect data at MNH

MUHIMBILI NATIONAL HOSPITAL

Cables: "MUHIMBILI"
 Telephones: +255-22-2151367-9
 FAX: +255-22-2150534
 Web: www.mnh.or.tz



Postal Address:
 P.O. Box 65000
 DAR ES SALAAM
 Tanzania

In reply please quote:

MNH/TRCU/IRB/Permission/ 2019/119

22nd July, 2019

✓ Head of Department
 Ophthalmology
 Muhimbili National Hospital

RE: PERMISSION TO COLLECT DATA AT MNH.

Name of Student	Rebecca Elias Kasika
Title	"ACCESSIBILITY AND UTILIZATION OF EYE HEALTH SERVICES IN TERTIARY HOSPITALS IN DAR ES SALAAM TANZANIA".
Institution	Muhimbili University of Health and Allied Sciences
Supervisor	Dr. Gloria Sakwari Dr. Sanyiwa
Period	22 nd July 2019 to 30 th December, 2019

Approval has been granted to the above mentioned student to collect data at MNH.

Named MNH based supervisor must ensure that the student abide to the ethical principles and other conditions of the research approval.

Sincerely,

Dr. Faraja Chiwanga

Head of Teaching, Research and Consultancy Unit

c. c DSS
 c.c Dr. Sanyiwa
 c.c Rebecca Elias Kasika



Appendix 8: Permission to conduct research at CCBRT



Rebecca Elias Kasika
 Muhimbili University of Health and Allied Science
 P. Box 65001
 Dar es Salaam Tanzania

19th July 2019

Ref: CCBRT/HR/191907

Dear Rebecca,

RE: REQUEST TO CONDUCT PART OF RESEARCH AT CCBRT REF NO HD/MUH/T.427/2017

Warm regards from CCBRT!

With this letter we like to confirm receipt of your request to conduct interviews for your research on *Accessibility and utilization of Eye Health Services in Tertiary Hospitals in Dar es Salaam Tanzania* as part of your studies in MUHAS.

CCBRT has reviewed all the submitted documents and hereby accepts your request to conduct the interviews as planned. Please liaise with the Head of our Eye Department – Dr. Cyprian Ntomoka - on the practical arrangements as we would like to minimise the disturbances for our normal services.

Upon arrival at CCBRT you are requested to sign a student agreement at our HR department. You are requested to provide a copy of your (student) ID. You will be provided with a CCBRT name badge.

We understand that there are no financial obligations on our side and you will take care of your own arrangements for transport, food and accommodation. In case you will provide a token to the interviewees for their participation, we would like to be informed up front.

On Behalf of CCBRT,

Bedan Gichanga
 Chief Medical Officer

Cc: - Student
 - HOD Eye