KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING TASK SHIFTING OF EYE CARE SERVICES IN KENYA

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DECLARATION

DECLARATION:

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Signed: ..... Date: 11th June 2020

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Approval:

This research thesis has been reviewed and submitted for examination with my approval as University Supervisor.

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ABSTRACT

Task shifting is a practice whereby tasks are delegated, where possible, to staff with shorter trainings and fewer qualifications, often to address human resource shortages. Kenya, like many Sub Sahara African countries, has a shortage of Ophthalmologists, with only about 132 serving a population of almost 48 million. The main objective of this study was to establish the knowledge, attitude and practices of Ophthalmologists and Non-physician Cataract Surgeons (NPCS) in Kenya, regarding task shifting of eye care services. Four subsidiary objectives that guided this study were: to determine the knowledge of Ophthalmologists and NPCS in Kenya regarding task shifting of eye care services, to determine the attitude of Ophthalmologists and NPCS in Kenya regarding task shifting of eye care services, to determine the practices of Ophthalmologists and NPCS in Kenya regarding task shifting of eye care services and to determine the role of task shifting, its merits, demerits, critical success factors as well as duration over which task shifting should be utilized in Kenya. The Theoretical framework used in this study was Principal-Agent Theory. For this study a mixed-methods approach was employed, involving a survey and key informant interviews. A pre-tested, structured online questionnaire was sent to 267 prospective participants via email or whatsApp. A response rate of 60.3% was achieved, with 161 out of 267 prospective participants returning the questionnaire. A total of 32 key informant interviews were conducted via telephone with purposively selected participants from both groups. Quantitative data was analyzed using SPSS version 23 to generate proportions, frequencies, and percentages. Results were presented in form of graphs, pie-charts and tables. For the qualitative study, interview recordings were transcribed into a text program following which the qualitative data was analyzed using Nvivo version 11. The findings of the quantitative and qualitative methods were integrated during the interpretation/ discussion phase of the study, following a sequential explanatory model. Majority of the participants understood what task shifting is; deemed it as necessary and affirmed that they delegated some tasks to other cadres in the course of their day to day Ophthalmic practice. Medical task shifting was acceptable to majority of the respondents, as was surgical task shifting. There was concern about Optical task shifting owing mainly to erroneous prescription of spectacles by some NPCS. Majority of the workplaces did not have Policies and Guidelines to inform task shifting practices. Almost all the key informants agreed that task shifting had a role in Ophthalmology in Kenya. A number of benefits were cited by participants, including cost savings, improved access to care, equitable distribution of eye health workers, improved quality of care amongst others. Several challenges were also mentioned by participants, including: unregulated task shifting environment, unclear scope of practice, lack of a legal framework for task shifting amongst others. Participants in this study knew about task shifting, deemed it as necessary and thought it should be practiced for as long as there's a shortage of Ophthalmologists in the country. Several benefits were brought forth by the participants, but there were also several significant challenges that ought to be addressed by the decision makers, going forward. Attention should be paid to training and deploying enough Ophthalmologists to cover the whole republic in the long term.

DEDICATION

I dedicate this work to my beloved wife Esther, and to our children Bradley and Kayla.

"Knowledge is like a sphere, the more it expands, the more it touches the unknown."

Albert Einstein

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First, may I thank the Almighty God for the gift of life, and for enabling me to undergo the MBA Healthcare Management training at Strathmore University Business School. The journey has indeed been transformational. My heartfelt gratitude goes out to my beloved wife Esther Nabalayo and to our children Bradley and Kayla, for their understanding and support during the conduct of this study. I'm thankful to my study supervisor Dr. Pratap Kumar and the SBS faculty for their invaluable input into this project. To Esther Namisi, my very able Research Assistant, thank you very much for the good work. I appreciate my MBA classmates and professional colleagues in Ophthalmology, for their invaluable input and constructive criticism of this work; your participation in both strands of the study is truly appreciated. To my role model Dr. Michael Gichangi, Head of Ophthalmic Services Unit, thank you for introducing me to the world of Management. May I also thank Dr. Frederick Korir and Dr. Millicent Bore (Ophthalmological Society of Kenya) and Mr. George Ohito (Ophthalmic Clinical Officers Association of Kenya), for kindly providing member contacts. I'm grateful to the CEO Moi Teaching and Referral Hospital Dr. Wilson Aruasa and to the HOD Ophthalmology Dr. James Bett, for their support and encouragement. To the Sabatia Eye Hospital Family, thank you for inspiring me to undertake this training. It may not be possible to mention by name all the wonderful people who contributed in one way or the other, to the implementation of this project. I will forever remain indebted to you. Please accept my sincere gratitude for all your help. May God bless you all.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES:

LIST OF ACRONYMS AND ABBREVIATIONS:

AMREF: African Medical Research Foundation (now Amref Health Africa)

ARMD: Age Related Macular Edema

CHW: Community Health Worker

HIV: Human Immunodeficiency Virus

HRH: Human Resource for Health

HSS: Health Systems Strengthening

IAPB: International Agency for the Prevention of Blindness

KNH: Kenyatta National Hospital

LSHTM: London School of Hygiene and Tropical Medicine

M.Med: Master of Medicine

MD: Medical Doctor

MOH: Ministry of Health

NACOSTI: National Commission for Science, Technology and Innovation

NCD: Non Communicable Diseases

NPCS: Non Physician Cataract Surgeon

NTD: Neglected Tropical Diseases

OA: Ophthalmic Assistant

OCO/CS: Ophthalmic Clinical Officer/ Cataract Surgeon

ON: Ophthalmic Nurse

OSU: Ophthalmic Services Unit

PHC: Primary Health Care

PhD: Doctor of Philosophy

PRISMA: Preferred Reporting Items for Systematic reviews and Meta-Analyses

SPSS: Statistical Package for Social Sciences

SSA: Sub-Saharan Africa

SU-IERC: Strathmore University Institutional Ethics Review Committee

TS: Task Shifting

WHO: World Health Organization

WMA: World Medical Association

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The World Health Organization (WHO) defines task shifting as the process whereby specific tasks are moved, where appropriate, to health workers with shorter training and fewer qualifications (World Health Organization, 2008). This practice of task redistribution has been associated with efficient utilization of available human resources, leading to improved service delivery, (Bergstrom. 2015). It has also been referred to as delegation, task sharing amongst other terms. Even though task shifting is a relatively new phrase, many countries have had a long standing experience with this practice. Examples include the Barefoot Doctors of China, (Xu, 2014), Surgical Technicians (*Technicos de cirurgia)* of Mozambique (Chu, 2009), Clinical Officers of Kenya and Assistant Medical Officers of Tanzania amongst others. In some countries such as Uganda, Pharmaceutical technicians (Dispensers) perform tasks that would otherwise have been performed by Pharmacists; this is due to the shortage of Pharmacists in such countries (Dambisya, 2012).

Even though this approach has been used mainly by the low and middle income countries, high income countries like the United Kingdom have utilized Nurse Practitioners to prescribe routine medicines (World Health Organization, 2007). In the Kenyan eye health system, Ophthalmic Clinical Officer/ Cataract surgeons have contributed significantly to service delivery (Palmer, 2014). Other cadres such as Ophthalmic Nurses and Ophthalmic Assistants are recognized by the Kenyan Eye Health System (Ministry of Health, 2012). This study sought to establish the knowledge, attitude and practices of Kenyan Ophthalmologists and Ophthalmic Clinical Officer/ Cataract Surgeons regarding task shifting.

Human Resource for Health is often cited as the cornerstone of healthcare service delivery. This is because of the vital role the health workforce plays in the delivery of health services. World Health Organisation, (2006, p2), contended that; “At the heart of each and every health system, the workforce is central to advancing health.” Shortage of

Human Resource for Health is recognized as a major problem in Sub-Sahara Africa (SSA), which has a quarter of the global burden of disease, but only 3 percent of the world's health workers (WHO, 2013). Additionally, the shortage of trained health workers has been reported to be greatest among populations that are most deprived (WHO, 2010; Gessessew, A., 2011). In 2010, Africa was estimated to have 4.8 million blind people. A further 16.6 million had severe to moderate visual impairment (International Agency for the Prevention of Blindness, 2014); Naidoo and Gichuhi, 2014). Kenya, like many SSA countries, is confronted with shortages of human resource for Eye health (Ministry of Health, 2012; McCord, 2009).

The WHO, in 2006, adopted a threshold of 2.28 skilled health workers per 1000 people. Falling below that prescribed threshold qualifies a country to be called a human resource for health (HRH) crisis country, according to WHO. As at 2010, Kenya's ratio of Physicians (Medical Doctors) to population was reported to be 0.18 MD/1000. In 2014, the ratio was 0.20/1000. This clearly represents low Physician density (World Bank, 2014). Further, the WHO reported that, as at 2011, 37 out of the 57 HRH crisis countries were in Sub-Saharan Africa. Additionally, even countries with seemingly high densities of health workers had Human Resource for Health mal-distribution. This disparity applied to rural and urban areas as well as between public and private sectors.

Task shifting has been cited as one of the strategies that some Sub-Sahara Africa countries are using to address the health workforce shortage (Fieno, 2016). This applies to eye health as well. The International Agency for the Prevention of Blindness (IAPB) recognizes that there is a severe shortage of eye health workers in Sub-Sahara Africa (IAPB, 2014). This is likely to worsen as population growth outpaces that of the number of eye health providers. An IAPB Policy paper recommends several interventions including increased investment in eye health, integration of eye health workforce provision into strategies that plan for and manage human resource for health, as well as health systems that are stronger and more equitable. The Policy paper further recommends establishment and implementation of strategies that are appropriate, including training, retention as well as task shifting (IAPB, 2014).

Another factor contributing to worsening of the eye health workforce crisis is longer life expectancy. Increasingly more people live with age-related eye diseases such as Cataracts and Age Related Macular Edema (ARMD). Additionally, there has been an increased prevalence of Non-Communicable Diseases (NCDs) such as Diabetes and Hypertension, both of which may lead to blindness. Some Neglected Tropical Diseases (NTDs) such as Trachoma lead to blindness if not well managed. The targeted elimination of this blinding disease by 2022 requires concerted efforts by eye care workers.

As at 2012, Kenya had only 87 Ophthalmologists serving a population of almost 40 million. Forty one of these Ophthalmologists (47%) worked in Nairobi Province. This represented a severe shortage of Ophthalmologists as well as mal-distribution. Other cadres such as Ophthalmic Clinical Officer/ Cataract Surgeons, also called Non-Physician Cataract Surgeons (NPCS), Ophthalmic Nurses, Optometrists and Ophthalmic Assistants assist with the huge eye care workload (Government of Kenya, 2016).

A number of countries have recorded success in their health sector owing to task shifting. Ethiopia, for instance, has been able to improve several of its health indicators due to task shifting (Banteyerga, Akiliku, Conteh, & McKee, 2011). Amongst other strategies contributing to Ethiopia's success includes training of 30,000 women as health extension workers by 2009. Through the Health Extension Programme started in 2003, these women delivered several prevention interventions including distribution of bed nets, vitamin A supplementation, basic obstetric and neonatal care as well as management of childhood diseases. The result of task shifting combined with other strategies has been significant health gains for Ethiopia, in comparison with other countries in the region. (London School of Hygiene and Tropical Medicine (LSHTM), 2012; Balabanova, *et al*., 2013).

Bangladesh has also benefited immensely from task shifting. It has recorded unprecedented reduction of maternal mortality rate and infant mortality rate, amongst other health gains, by training and deploying thousands of health assistants. Task shifting to these women working as health assistants includes delivery of medicines, reporting of

early signs of diseases, passing of family planning messages amongst others. Task shifting has led to what is referred to as the "Bangladesh Miracle", implying achievement of Health Sector Success before Economic Prosperity (Koehlmoos, 2011; Rosling, 2007).

1.2 Statement of the Problem

Globally, an estimated 2.2 billion people have vision impairment or blindness (WHO, 2019). In 2012, it was estimated that 285 million people were visually impaired (WHO, 2012). In addition to this, there are not enough eye health workers. This shortage is worst in Sub-Sahara Africa with only 3% of the world's healthcare workers, despite shouldering a quarter of the Global Burden of Disease. Kenya, like many Sub-Sahara Africa countries, has a shortage of Ophthalmologists, with only about 132 serving a population of almost 48 million. This number is insufficient. Additionally, most of the Ophthalmologists work in the cities and major towns, leaving the rural areas where most Kenyans live underserved; this represents mal-distribution (IAPB, 2014). Task shifting is known to have been used successfully in other areas of medicine such as HIV/AIDS care, amongst others. In Kenya currently there are about 135 Non Physician Cataract Surgeons providing some aspects of eye health services. Task shifting strategy has been promoted by the World Health Organization to help resolve the eye health workforce shortage. Most of the studies done focus on the perspectives of healthcare managers, without due regard to the perceptions of the cadre of healthcare practitioners from whom tasks are shifted. Few studies report on the perspectives of those to whom tasks are shifted (Rustagi, 2015). In eye health service provision, it is not known how the people who have lost some tasks (Ophthalmologists) and the recipients of such delegated tasks (NPCS) feel about this practice. A thorough understanding of their perspectives may make the implementation of task shifting more effective in the provision of eye health services. It is in light of this statement that the study sought to establish the knowledge, attitude and practices of Ophthalmologists and NPCS in Kenya, concerning task shifting of eye care services.

1.3 Research Objectives

1.3.1 Main Objective

To determine the knowledge, attitude and practices of Ophthalmologists and NPCS in Kenya concerning task shifting of eye care services.

1.3.2 Specific objectives:

1. To determine the knowledge of Ophthalmologists and NPCS in Kenya regarding task shifting of eye care services.
2. To determine the attitude of Ophthalmologists and NPCS in Kenya regarding task shifting of eye care services.
3. To determine the practices of Ophthalmologists and NPCS in Kenya regarding task shifting of eye care services.
4. To determine the role of task shifting, its merits, demerits, critical success factors as well as duration over which task shifting should be utilized in Kenya.

1.3.3 Research Questions

1. What knowledge do Ophthalmologists and NPCS in Kenya have concerning task shifting?
2. What are the attitudes of Ophthalmologists and NPCS in Kenya concerning task shifting in the delivery of eye care services?
3. What are the practices of Ophthalmologists and NPCS in Kenya concerning task shifting of eye care services?
4. What is the role of task shifting, its merits, demerits, critical success factors as well as duration over which task shifting should be utilized in Kenya.

1.4 Scope of the Study

This study was conducted in Kenya. It involved administering an online structured questionnaire to all consenting participants. Additionally, key-informant interviews were conducted with purposively selected participants. The study participants included Ophthalmologists and NPCS practicing in Kenya in the year 2019. The quantitative study was set to determine their knowledge, attitude and practices regarding task shifting of eye care services in Kenya. The qualitative examined the role of task shifting, its merits,

demerits, critical success factors as well as duration over which task shifting should be utilized in Kenya.

1.5 Significance of the Study

The study intended to contribute to the body of knowledge on task shifting/ task sharing of health care services. It sought to elicit the perspectives of a cadre from whom tasks are shifted (Ophthalmologists) and compare these with a cadre to whom tasks are shifted (NPCS). This may inform inter-cadre collaboration which may be necessary in ensuring the success of task sharing strategies to address the human resource for eye health challenge. The study intended to contribute towards task sharing policy formulation, reviews and practical implementation of task sharing in eye care service delivery.

1.6 Limitations of the Study

Data was collected in the months of April and May 2020, at a time when the world was pre-occupied with fighting the COVID-19 pandemic. This may have affected the questionnaire return rate to some degree. Familiarity or otherwise, with the online survey tools may also have affected participation by some of the prospective participants. Despite an initial technical hitch with the online questionnaire, a response rate of 60.3% was attained through enhanced follow up and communication with the participants.

For the qualitative study, limited time, financial resources and the social distancing and travel restrictions in place during the data collection period meant no physical interviews could be held hence all interviews were conducted via phone.

1.7 Operational Definition of Terms

Attitude: In this study attitude meant "all of a person's inclinations, prejudices, ideas, fears, and convictions about any specific topic; a settled way of thinking or feeling about the topic of interest." (https://www.google.com).

Key-informant interviews: These are "qualitative in-depth interviews with people who have first-hand knowledge or particularly informed perspectives about a phenomenon or topic of interest." (healthpolicy.ucla.edu).

Knowledge: In this study knowledge referred to "facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject." (https://google.com/sea).

Mixed-methods study: It is the type of research in which a researcher combines elements of qualitative and quantitative research approaches for the purposes of breadth and depth of understanding and corroboration. (Cresswell, J.W., 2013).

Non-physician cataract surgeon: This refers to health workers who, by virtue of their training, have fewer clinical skills than physicians but more than nurses. They are mainly trained at Higher National Diploma level to manage simple eye ailments and perform cataract surgery. (www.researchgate.net).

Ophthalmic services unit: A unit at the Ministry of health, mandated to coordinate Eye health matters in the Republic of Kenya.

Ophthalmologist: This refers to a specialist physician in the branch of Medicine concerned with the study and treatment of disorders and diseases of the eye.

Practice: It refers to the "actual application or use of an idea, method or belief." (www.merriam-webster.com).

Task-sharing: Refers to delegation of tasks across cadres to improve efficiency in service delivery. (World Health Organization, 2008).

Task-shifting: In this study task shifting refers to a process whereby specific tasks are moved, where possible, to health workers with shorter trainings and fewer qualifications. (World Health Organization, 2008).

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Review of related literature refers to a critical appraisal of the status of knowledge pertaining to a topic of interest. Such review highlights past studies that relate closely to the subject under investigation (Mc Millan and Schumacher, 2001). In conducting literature review, attention is paid to demonstrating the current knowledge about a given phenomenon as well as highlighting the existing knowledge gaps. In this study, literature review incorporated information needed in answering the research questions outlined in chapter one. The review focused on theoretical framework, empirical literature review on knowledge, attitude and practices regarding task shifting, conceptualization of variables and knowledge gap summary.

2.2 Theoretical Framework

Principal-Agent Theory

This study was anchored on the Principal-Agent theory. Developed in the 1970s by Michael Jensen and William Meckling, the agency theory is often utilized in explaining and resolving matters relating to the relationship between business principals and their agents (Holmstrom and Milgrom, 1991).

According to Feltham, Gerald and Xie. (1994), Principal-Agent theory was first applied in sharecropping, with the land owner as the principal and the farmer being the agent. It may also apply to a scenario where a company's shareholders are considered to be the principal(s) and their Chief Executive Officer the agent. The theory may be used to analyze a chain of command including a principal, supervisor and agent. It may also include one principal and several agents, or a combination of steps constituting an institutional tree. In this theory, the pivotal idea revolves around the principal being too busy to perform a given assignment. He therefore appoints an agent to perform the duty on his behalf. The principal, being too busy, is often presumed not to monitor the agent properly.

In the context of this study, the Ophthalmologist (principal) may delegate to a Non-Physician Cataract Surgeon (agent) to perform some tasks, for example cataract surgery, on behalf of the Ophthalmologist. It follows that the NPCS should be accountable to the Ophthalmologist, hence the necessity for monitoring and support supervision.

Information asymmetry is represented by the different levels of training of the two cadres, the Ophthalmologists having undergone at least a Masters in Medicine degree training whereas most of the NPCS have at least a Higher National Diploma in Ophthalmology. The NPCS are thus expected to consult with their Ophthalmologist colleagues when there's need to do so, particularly for difficult cases. A moral hazard may ensue if the NPCS, in performing a delegated task, has a different objective compared to that of the Ophthalmologist.

An agency problem may be said to exist if the NPCS have different objectives in performing tasks delegated to them from the Ophthalmologists. To reduce the chances of agency loss due to the agency problem occurring, agency costs may need to be incurred, such as training costs, monitoring costs, support supervision costs as well as remuneration of the cadres involved in task shifting.

The patient-provider relationship in a task shifting model can also be explained using the agency theory. The patient (principal) pays the Ophthalmologist or NPCS (the agent), to provide eye care services. In so doing, it is possible that the provider, being an imperfect agent, may have a different objective (of maximizing their profits) from that of the patient (of getting healed from their disease). The principal-agent theory can therefore be aptly applied in explaining of various aspects of task shifting as applied to eye care service delivery as shown in figure 2.1:

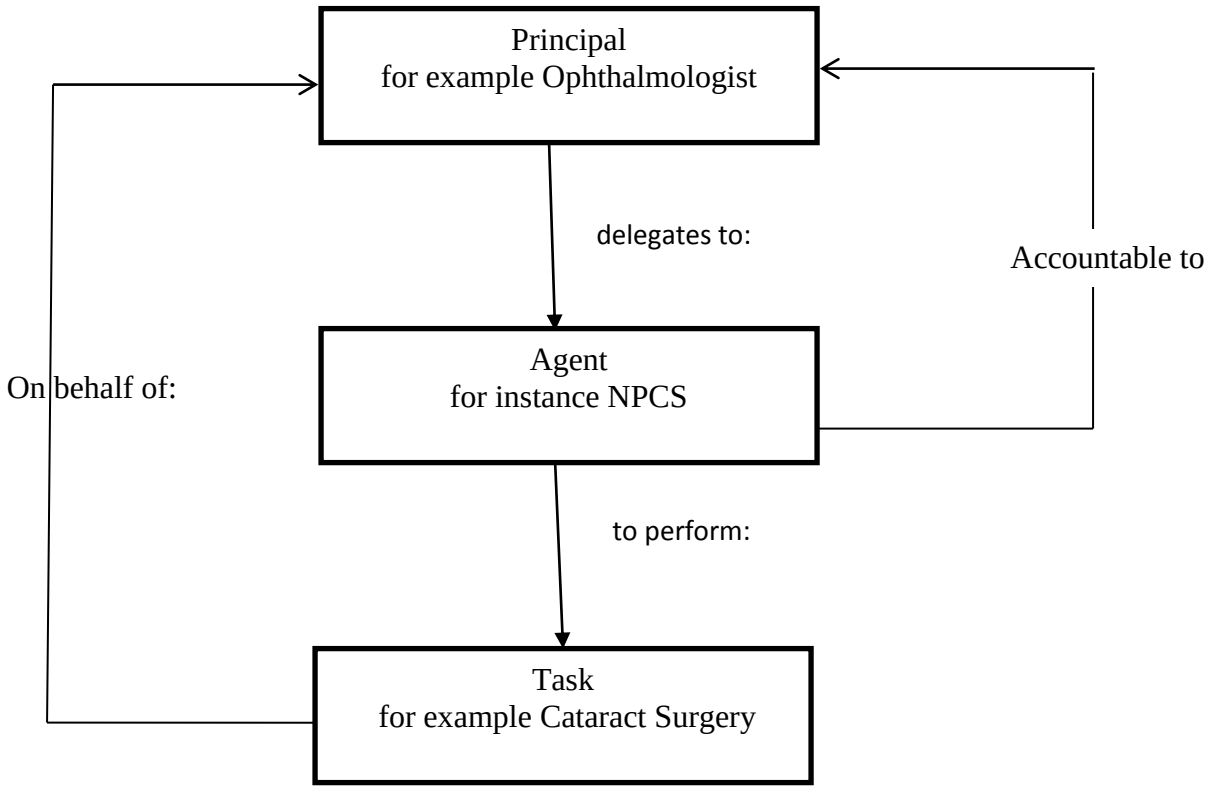


Fig. 2.1: Principal-Agent theory as applied to eye health.
Source: researcher (2020).

2.3 Empirical Literature Review

2.3.1 Knowledge of Task Shifting

Over the last decade, several studies have reported on various aspects of task shifting of eye care services in Sub-Saharan Africa (SSA). Hale, Lewallen & Courtright (2012), in a desk review, examined several factors, including: how extensively NPCS are used in Africa, how well this cadre works to ensure provision of quality eye care, as well as factors that may determine this cadre's effectiveness. Methods used in this study included a review of literature on non-physician cataract surgeons, from various sources. A total of 98 articles and reports were reviewed in full text. Fifty percent of the 28 National Eye Coordinators responding to a survey about Cataract surgeons affirmed that NPCS were employed in their countries. Of the 256 NPCS reported, most (73%) worked in Kenya,

Tanzania and Ethiopia. Additionally, 73% of these NPCS worked in facilities that also had Ophthalmologists while 27% worked alone.

Regarding productivity, Courtright, *et al.* (2007), in a review that looked at Cataract Surgeries in eastern Africa, reported that NPCS performed 77,120 surgeries between 2000 and 2004. There are not many studies reporting on outcomes of surgeries performed by NPCS as compared to those performed by Ophthalmologists. Whitfield (1981), in a prospective study, compared 100 cataract extractions done by Ophthalmologists and Clinical Officers respectively. He concluded that, "though some complications were slightly higher for the Clinical Officers, their surgical outcomes were comparable to the Ophthalmologists." Yorston, *et al.* (2002) in a prospective trial monitoring cataract surgical outcomes, reported no significant differences between outcomes obtained by Ophthalmologists and NPCS.

From the decision-makers perspective, Eliah *et al.* (2014), in a study on task shifting for Cataract Surgery in Eastern Africa, examined the productivity (annual cataract surgery rate) and attrition of Non-Physician Cataract Surgeons (NPCS) in Kenya, Malawi and Tanzania. This survey involving 135 NPCS used a pre-tested questionnaire to collect data on training, support as well as productivity of NPCS. Telephone interviews were used to collect follow-up data annually. Data was analyzed using STATA statistical software package (StataCorp LLC 4905 Lakeway Drive College Station, TX 77845. United States). They found, amongst other things, that NPCS are likely to be productive in a set up where they have three or more nurses as assistants. Amongst their recommendations was the need to train and deploy the right numbers of support staff to work with the surgeons, in order to enhance their productivity.

The study concluded that high quality training, though essential, was not sufficient to meet a population's eye surgery needs. Other factors were needed such as supporting institutions, support staff, functional equipment as well as programs for recruiting and transporting patients. The study also concluded that "personnel with skills to supervise Non-Physician Cataract Surgeons must be trained and supported to carry out

supervision." This cadre includes Ophthalmologists. Drawing important lessons from strategies to tackle the increasing burden of HIV/AIDS in Africa, task shifting approach has been suggested as a way of freeing up a percentage of the time of the limited professional workforce so that they can take on more complex cases (Institute of Medicine, 2011).

2.3.2 Task Shifting for Primary Eye Care

In the Perspectives on Primary Eye Care (PEC) report from the 8th General Assembly of the IAPB, (2008), formal task shifting has been examined. This is in regard to primary eye care service provision by general healthcare workers at the basic level. In that report, only approximately 30% of Africans access specialized eye health services. This implies that in the rest of the areas, eye care is provided by frontline health workers who may not be sufficiently trained to do so. This assumption is supported by a review from Rwanda which observes that general health workers without special training in eye health offered under the official Primary Eye Care program, were also providing eye care to patients (Courtright, *et al*., 2010).

In an East African Task Shifting brief of March 2011, a baseline survey done in two districts in Malawi found that, of the 78% of the health care workers providing diagnosis and treatment of eye ailments, 48% of them lacked formal training in primary eye care. These were mainly patient attendants. It was reported that, for several years, Kenya, Tanzania, Malawi and South Africa had been integrating Primary Eye Care into the general Primary Health Care workers' role. It was unclear whether this was included in the training curricula or in the official job descriptions.

Malawi has utilized task shifting in promoting enhanced diagnosis, treatment as well as referral at the health centre level. To achieve this, Primary Eye Care Training curricula for Nurses and Medical Assistants are utilized. According to a research brief by the East African task shifting AHSI team, these workers, in general, have poor skills. For instance, only 56% could accurately identify a white cataract. In addition, these workers attend to 5 patients per year on average; this is considered insufficient to help maintain their skills.

About twenty years ago, the Tanzanian government embedded a formal primary eye care training component into health care workers' training. This included Nurses, Clinical Officers and Medical Doctors. A study done in one district of Tanzania in 2010 assessing the Primary Eye Care knowledge, skill and productivity of 49 general health workers found that they had poor general knowledge. Workers' ability to diagnose and manage four common eye conditions and correctly measure visual acuity was tested. An average score of 6.2 out of 12 was obtained. In this study, the ability to correctly identify cataracts by these health workers was reported as 67.3%, only slightly higher than that of traditional health workers in a Malawian study. Only 41% of the health workers had been trained in Primary Eye Care even though all health workers agreed that they provided eye care. Of all the workers, only two recalled being trained on visual acuity assessment.

Curiously, Primary Eye Care training of the health workers did not translate to higher test scores. More recent graduates registered higher test scores. Scores were also higher amongst Clinical Officers compared to Nurses as was among Men compared to Women. Regarding equipment, visual acuity charts and examination torches were unavailable in all of the 36 health centres. Poor test results were blamed on several factors, including inadequate supervision, lack of equipment such as eye charts, poor training as well as low patient volumes (Byamukama & Courtright, 2010). Based on these findings, the authors recommended reassessment of training needs, skills mix and skills-based supervision.

An Ethiopian study done in 2011 examined Primary Eye Care knowledge and skills of Health Extension Workers. Such workers were female government health staff with a year's training whose aim was preventing common diseases. It was reported that 48.6% lacked training in eye care. The remainder had received pre-service training, in-service training from an NGO or had learnt from workmates. The level of knowledge was generally poor. Cataract and trachoma as causes of blindness were only identified by 37% of the respondents. Most of the workers proposed referral of cataract patients even though over half of them didn't understand the diagnosis. Despite trachoma signs and symptoms being correctly identified by 89%, only10 were able to identify strategies to control this disease.

The authors concluded that "Health Extension Workers have some level of useful awareness about common blinding eye diseases such as trachoma, cataract, and childhood blindness but not much about refractive error and glaucoma. However, their knowledge of prevention of blindness was limited to hygiene education." The Health Extension Workers recognized that, in their communities, blindness was a problem. They expressed willingness to participate in blindness prevention (Hailu,Y., *et al*., 2009). A formal integration of Primary Eye Care education into the Health Extension Workers' training was recommended by the authors.

2.3.3 Reasons Advanced for Task Shifting

The insufficiency of adequately trained health workers is a global problem. Low and middle income countries suffer the most, even though high income countries are not spared either. The acuteness of this problem is evidenced by low staffing levels, in some instances 50% or less, for some cadres of health workers, in relation to the established positions, particularly in hard-to-reach and stay rural areas (Wambi, 2009).

Task shifting has the potential to result in cost savings as the lower cadres are often paid less than the professional staff. In a study reviewing recent evidence of health workforce skill - mix and task shifting in low income countries, Fulton *et al.* (2011) found that surgically trained Assistant Medical Officers, working in district hospitals, had similar patient outcomes at a much lower cost compared to the Physician Obstetricians and Gynecologists. This position is supported by Seidman and Atun (2017) who, in a systematic review of evidence from low-income and middle-income countries, posit that task shifting yields cost savings and improves efficiency for health systems. In this study, Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines were used to search Pubmed, Embase, Cumulative Index of Nursing and Allied Health Literature (CINAHL) as well as the Health Economic Evaluation Database. Peer reviewed articles demonstrating cost impact of a task shifting program in a low and middle-income country (LMIC) were included. Of 794 articles, 34 qualified for inclusion in the study. The authors report finding significant evidence for attaining cost savings as well as improvement in efficiency from task shifting activities related to HIV/AIDS and

Tuberculosis care. Cost savings is debatable as task shifting may be associated with new costs linked to training and remuneration of new cadres as well as incentives for the professional staff who are expected to assume additional training, supervisory and support roles, especially where assistive cadres are utilized (World Medical Association, 2019).

Task shifting facilitates rationalization or redistribution of Human resource for health as the lower cadres are more likely to work and be retained in the underserved, often rural areas. Such up-skilled cadres are also less likely to emigrate internationally owing to lack of complementary recognition. Dovlo (2004), in a desk review, found task shifting to be important in Health Systems in Africa owing to the cost effectiveness of utilizing substitute health workers, as well as their relative retention within countries and rural communities. Task shifting therefore helps in achieving some degree of geographical equity in eye care service delivery. It may, if well administered, lead to higher quality of service delivery. A WHO report (2006) on task shifting recommends that task shifting should be aimed at overall improvement in quality of service delivery.

McCord and colleagues (2009), in a retrospective study, reviewed medical records of patients who required emergency Obstetrical operations. Of these, 945 surgeries were done by an Assistant Medical Officer (AMO) and 313 by a Medical Officer. Their assessment of the quality of emergency Obstetrical Surgery in Tanzania district hospitals showed that, for major Obstetric operations performed by AMOs and Medical Officers, there existed no statistically significant differences in the post-operative outcomes, risk indicators and quality of care indicators for the two groups. Task shifting has also been said to create local jobs for community health workers. Some writers look at task shifting as a way of job enrichment, which is supposed to lead to job satisfaction (intrinsic satisfaction) as well as monetary and fringe benefits or extrinsic satisfaction (Graham, 1998).

2.3.4 Demerits of Task Shifting:

Some authors on this subject have argued that task shifting is not necessary and could lead to poor service delivery. In a qualitative scoping study on task shifting conducted by

Baine and Kasangaki (2014) in Uganda, proponents of task shifting reasoned that some tasks belonging to trained professional health workers were already being performed by lower cadres. They opined that such lower cadre workers required support supervision as well as a supporting policy. Opponents of task shifting were of the view that the lower cadre health workers were incompetent and overworked. Additionally, they viewed task shifting as being more expensive compared to recruitment of fully trained health workers. This view was shared by majority of the policy makers and health managers who took part in the study. It is noteworthy that this qualitative study involved a review of published and grey literature, as well as key informant interviews of stakeholders responsible for health policy and decision making in Uganda. Task shifting in this context was practiced informally as Uganda did not have Task shifting Policy and Guidelines.

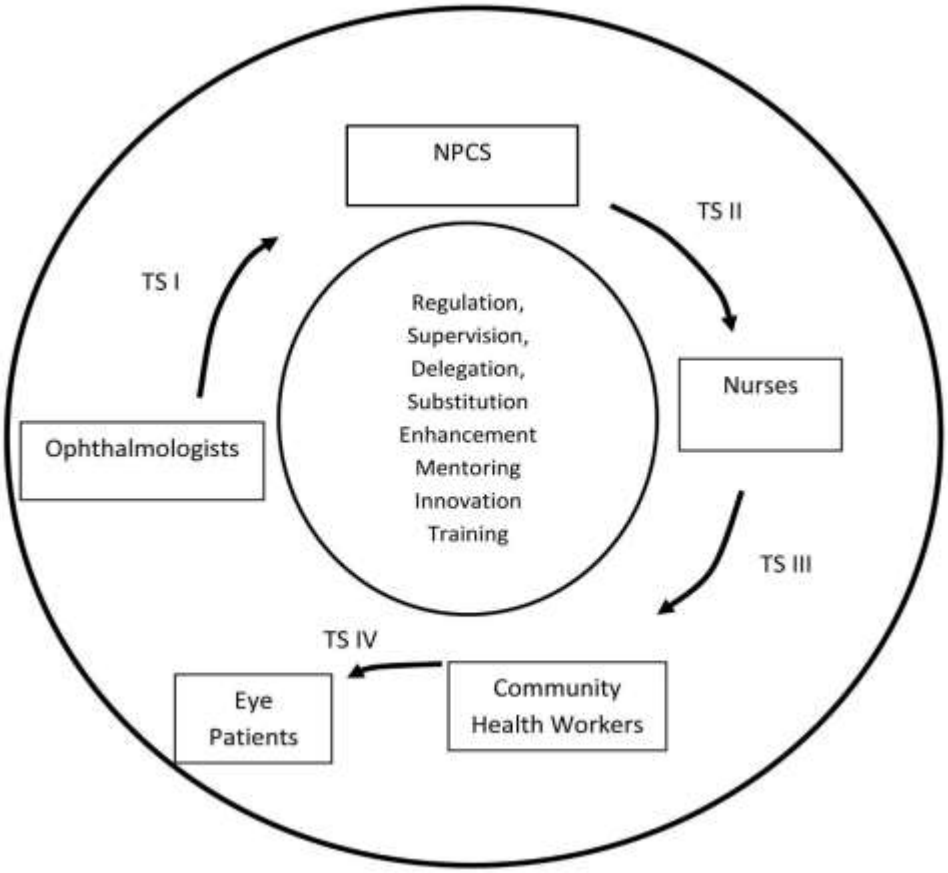
There is lack of regulatory frameworks as well as agreements on standards in many countries. Task shifting, if poorly implemented, with no review of job titles and rewards despite expanded roles, can be very frustrating to the recipients of such new responsibilities. This is likely to be compounded by lack of career progression. In a qualitative study utilizing individual interviews, group interviews as well as focus group discussions with the Civil Service health workers in Mozambique and Zambia, improvised task shifting attracted mainly negative reviews from participating health workers. Staff deficits and poor work conditions were associated with service unavailability in certain areas, increased workload, quality decline, conflicts between patients and provider, risks to patients, staff dissatisfaction as well as hazards for health workers and managers (Ferrinho, 2012; World Health Organisation, 2006).

2.3.5 Pre-requisites for Task Shifting:

The WHO, in its Treat, Train and Retain Plan on task shifting, has made several Global recommendations and Guidelines. These include recommendations on adoption of task shifting as a public health initiative; creation of an enabling regulatory environment for its implementation; ensuring quality of care; ensuring sustainability as well as recommendations on how the clinical care services should be organized. These recommendations are made in the context of improving access to HIV services (World

Health Organisation, 2008). The 22 recommendations are however, applicable to other fields of Medicine.

Good leadership and management, support supervision as well as political and financial commitment have been cited as characteristics of programs that succeed in their task shifting strategy (Lehmann, *et al*, 2009). Task shifting can be performed at various levels as indicated in Figure 2.2, adapted from a WHO report:



Key:

NPCS = Non-Physician Cataract Surgeon.

TS I, II, III, IV = Task Shifting levels I, II, III & IV.

Fig. 2.2: Task Shifting for Eye care. Model adapted from WHO: *Task shifting to tackle health worker shortage* (World Health Organisation, 2007)**.**

Task shifting may entail different approaches, including substitution of tasks among professionals, delegation of tasks to staff who have undergone less training, creation of a

new cadre of health workers, delegation of specific tasks to non-professional staff or at times a combination of these (WHO, 2008). In eye care, Sub-specialty trained Ophthalmologists may share tasks with General Ophthalmologists, who may in turn delegate some tasks to Non-Physician Cataract Surgeons, Ophthalmic Nurses, Ophthalmic Assistants or Community Health workers as appropriate.

The aim of task shifting is often to expand the human resource pool more rapidly in order to address a population's growing health needs, especially in countries with healthcare human resource shortages. In India, the Aravind eye care model has employed this strategy in the provision of eye health services, with impressive results. This resulted from the realization that over 80% of the tasks its Ophthalmologists performed were routine and repetitive, despite the fact that this resource was scarce and expensive. Inspired by Mc Donald's fast food chain, Aravind was able to re-engineer its business process to offer high volume, high quality, affordable eye care services to multitudes (Ravilla, 2014).

Task shifting represents a paradigm shift from conventional service delivery models that rely on highly trained, specialized and costly health professionals to a public health approach, using standardized, simpler and decentralized systems. This is aimed at maximizing the role of primary health care and community-led care.

2.3.6 Lessons Learnt from Countries that Practice Task-Shifting

Some high income countries such as the UK have had some practical experience with task shifting. They have used Nurse practitioners who prescribe routine medication. These have been instrumental in expansion of services as well as improvement of clinical outcomes for patients.

USA and Australia have a history of shifting some tasks from professional to non-professional community members, especially in the management of chronic conditions including Asthma, Diabetes mellitus and HIV. Low and middle income countries such as Ethiopia, Bangladesh and Mozambique have benefited immensely from task shifting. Some forms of task shifting such as the use of general nurses as trichiasis surgeons have

been characterized by high attrition rates as well as low surgical productivity (Gichangi *et al*, 2015).

2.3.7 Attitudes towards Task Shifting

Andriamanjato *et al.* (2014) in a prospective study assessing sensitivity and specificity of common signs and symptoms to predict conditions requiring referral to specialist eye personnel found that "sensitivities of individual symptoms and signs to detect sight threatening pathology ranged from 6.0% to 55.1% while the specificities ranged from 8.6 to 98.9%." The use of a combination of symptoms or signs increased sensitivity to 80.8% but specificity was 53.2%. The study concluded that "the sensitivity and specificity of commonly used symptoms and signs was too low to be useful in guiding Primary Healthcare workers to accurately identify and refer patients with eye complaints." This raised the question of whether the task shifting strategy can contribute to reducing visual loss or to providing acceptable quality service. It is noteworthy that this study involved Primary Health Care workers and not trained, dedicated eye care workers.

Okyere, Mwanri, & Ward, (2017), in a qualitative study involving 68 in-depth interviews with health workers in health centres and four in-depth interviews with facility in-charges and administrators found that the staff are occasionally involved in tasks beyond their job description and level of training; sufficient training was often not provided before assigning extra tasks; some of the workers saw an opportunity to acquire new skills from the additional work they undertook whereas the other workers perceived the additional work as overburdening and stressful. They concluded that task shifting is likely to be successful where procedures are well defined and there's well-coordinated and organized teamwork. This study employed phenomenological research design in description of the meaning as well as importance of health workers' and managers' experiences and perceptions regarding task shifting.

In Cambodia, in a cross-sectional mixed methods study comprising a survey and in-depth interviews, Shah, *et al*. (2018) sought to identify the current roles of eye and health care

workers in provision of eye care services as well as to investigate their potential roles in screening and detection of diabetic retinopathy through task sharing. In this study, three Ophthalmologists, with the support of Ophthalmic nurses, examined a total of 105,178 patients and operated on 14,030 eyes from 2009 to 2012. They found that the high demand for eye care services coupled with scarcity of Ophthalmologists favoured task sharing. They concluded that task sharing and team work for eye care was functional, and that the study participants favoured the potential role of Ophthalmic nurses in screening for diabetic retinopathy in a task sharing approach. It is noteworthy that they used purposive sampling of medical and non-medical stakeholders to capture diverse views.

Courtright, Mathenge & Kello, *et al.* (2016) aver that, considering the changing dynamics of eye diseases in Sub-Saharan Africa (need for specialized treatment of glaucoma and diabetic eye disease) and patient needs (demand for early, high quality cataract surgery) as well as the complexity of eye care service delivery, it does not make sense promoting the widespread use of NPCS. They opine that, in well-run, Ophthalmologist-led systems with many patients, NPCS may help free Ophthalmologists' time so they can attend to more complex eye problems. They conclude that "Sub-Saharan Africa does not need nor deserve substandard eye care."

Ophthalmologists are the highest trained cadre of eye care workers in Kenya. For a task shifting/ sharing strategy to be successful, Ophthalmologists will need to be involved more in training, assigning tasks as well as support supervision to middle-level and lower cadres of eye care workers. Other studies cite the health professionals' perceptions as being important to the success of task shifting (Cumbi, 2007).

The previous studies do not examine the attitude and practices of Ophthalmologists regarding task shifting. The World Medical Association (WMA), through their WMA Resolution on task shifting from the Medical Profession, expressed concern that task shifting is often an initiative of health authorities, devoid of consultation with physicians and their professional representative associations (World Medical Association, 2019).

Some studies report an initial hesitancy and even opposition among doctors to accept surgical task shifting (Bergstrom, 2015). Such concerns need to be addressed if task shifting is to be successful.

2.3.8 Practice of Task Shifting

Practice, according to the Merriam-Webster dictionary, refers to the actual application or use of an idea, method or belief. From previous studies, apart from a few examples, it is not clear what other forms task shifting takes; which tasks are shifted; to which cadres of eye care workers as well as to what magnitude (Mbanga, 2001). In a review of literature, Hale, Lewallen & Courtright (2012) mention three main areas where task shifting has been utilized in eye care. These include use of non-physician cataract surgeons for cataract surgery; trichiasis surgeons for trachoma surgery and primary healthcare workers for Primary Eye Care.

In a qualitative study investigating the experiences of 20 primary health workers trained in primary eye care as well as eight key informants working within specialist eye health services in two Tanzanian districts, Jolley, Mafwiri, Hunter, *et al*. (2017) found that, despite the primary health workers feeling confident in their own eye care skills, most of them felt constrained in the services they could provide. This was due to insufficient resources needed for diagnosis and treatment as well as lack of systematic supportive supervision for the work they did. Though specialist Ophthalmic staff were aware of these facts, they felt it was beyond their scope to correct the situation. They concluded that, despite the usefulness of training of primary health workers, this was not sufficient to address the burden of eye disease witnessed in rural Tanzania.

Courtright, *et al.* (2016), in a review of available literature, opine that Human Resource for Eye Health policies that are adopted now concerning various cadres should be examined in light of future eye health needs, especially considering the changing disease dynamics such as increased prevalence of diabetic retinopathy; patient needs such as higher quality cataract surgery delivered before blindness sets in as well as increasing complexity of eye care service delivery.

This study sought to determine the knowledge of Ophthalmologists and Non-Physician Cataract Surgeons in Kenya concerning task shifting. It also sought to determine the respondents' attitudes and practices pertaining to task shifting. It sought to find out the role of task shifting, what tasks they are comfortable shifting to another cadre, what tasks they are uncomfortable shifting and possible reasons; benefits that would accrue from task shifting as well as challenges attributable to task shifting. Additionally, the study sought to establish views on what needed to be done to ensure success of the task shifting strategy as well as how long task shifting of eye health services ought to be implemented in the republic.

2.4 Knowledge Gap

In reviewing literature, gaps in knowledge could be in content or methodology. The studies reviewed in this chapter, including several desk reviews, some prospective trials, a few retrospective studies, systematic reviews of available evidence, surveys, key informant interviews and focus group discussions have shed light on various aspects of task shifting in different fields of Medicine. There was scanty information to show how cadres who lose some eye care tasks and those to whom such tasks are delegated felt about this agency-type work relationship. This study, utilizing a mixed methods approach sought to provide information that will be useful in understanding how these cadres feel about this agency-type strategy.

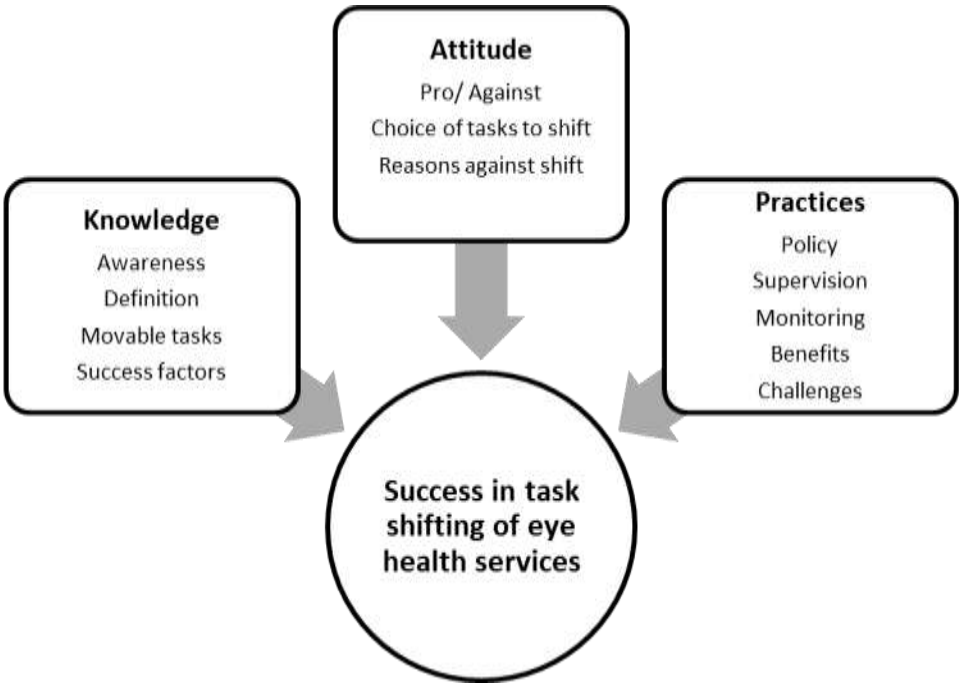
2.5 Conceptualization of Variables

Conceptual Framework

Study Variables:

The independent variables included Knowledge, Attitudes and Practices pertaining to task shifting. The dependent variable was success in task shifting of eye care services. This is shown in figure 2.3:

Independent Variables: Knowledge, Attitude and Practices.



Dependent Variable: Success in task shifting of eye health services.

Fig. 2.3: Conceptual Framework.

Source: Researcher (2020).

This illustration was used to show the possible relationship between the independent and dependent variables in this study. It attempted to highlight the factors that may influence task shifting as a strategy. Such factors may include knowledge about task shifting as well as attitudes towards task shifting of eye care services. Knowledge about task shifting may enable its adoption to address human resource for eye health challenges. Attitudes are thought to have an influence on the implementation and success of strategies such as task shifting. Gender, age, educational level as well as sub-specialty status may also influence the practice of task shifting. The prevailing practices may themselves influence how successful a task shifting strategy becomes.

2.6 Chapter Summary:

In this chapter, relevant literature was reviewed with an aim to provide answers to the research questions. The chapter presents the requisite theoretical framework, based on the principal-agent theory, onto which the study was anchored. It clarifies the study variables and sheds light on the knowledge gap that the study tried to address.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In this chapter, the research design and methodology used in establishing answers to the research questions are presented. The chosen research design is described in detail. The chapter also presents a discussion of the study population, sample and sampling techniques. Additionally, the data collection procedures are elucidated; this includes a description of the study instruments, procedures as well as data analysis. Finally, the chapter presents a discussion of the reliability and validity of the study instruments and ethical considerations taken into account during the conduct of the study.

3.2 Research Design:

The study utilized mixed methodology. This entailed the use of both quantitative and qualitative strands, in a sequential explanatory model. Employing a mixed methods approach presented a detailed and rich database to the researcher; this was useful for further investigation and writing. The researcher used a cross-sectional survey to gather quantitative data. This was followed by key informant interviews which yielded qualitative data. Mixing of the results was done during the interpretation and discussion phase of the study.

3.3 Study Site:

This study was done within the Republic of Kenya. (Appendix VI, Map of Kenya).

3.4 Population of the Study

According to Ogula, (2005), the term population is used to refer to a group of people, objects or institutions which have in common certain characteristics. In this study, the target population comprised Ophthalmologists and Non Physician Cataract Surgeons working in Kenya during the study period. The number of Ophthalmologists working in Kenya during the year 2019 was 132. That of the Non Physician Cataract Surgeons was 135. The total number of prospective participants was thus 267.

3.5 Sample and Sampling Techniques

Mugenda and Mugenda (2013) define a sample as "a smaller group or sub-group obtained from the accessible population." This sub-group from the entire population is often carefully selected to achieve representativeness of the entire population, in reference to certain characteristics. Each member of the sample may be called respondent, subject, interviewee amongst other terms. Sampling is defined as a process, procedure or technique of selecting a sub-group from a population. This smaller group is selected to participate in the study so as to be representative of the population (Ogula, 2005).

The researcher carried out a census on the target population of 267 prospective participants, comprising 132 Ophthalmologists and 135 NPCS. As pronounced by Herzog, Scheuren and Winkler (2010), a census is a study that obtains data from every member of a population. A census is only practical where the target population is small and there is a high probability of getting more information by targeting the entire population.

3.5.1 Inclusion Criteria

All consenting Ophthalmologists and Non Physician Cataract Surgeons practicing in Kenya during the year 2019 were included.

3.5.2 Exclusion Criteria

All non-consenting Ophthalmologists and Non Physician Cataract Surgeons were excluded.

3.6 Data Collection Methods

According to Altrichter, Feldman, Posch and Somekh (2008), the surest way of minimizing threat to validity, both internal and external, comprises utilization of methodological triangulation or the use of several research instruments. These authors believe that a more balanced and detailed picture of the phenomenon under study is obtained via triangulation. Similarly, Cohen and Manion (2000) opine that by studying human behavior from several perspectives, the richness and complexity of such behavior is better understood.

3.6.1 Data Collection Tools

This study utilized two research instruments; a questionnaire and a structured interview guide. The selection of these tools took cognizance of the nature of data to be collected, available time and study questions. For the quantitative strand of the study, a pre-tested structured questionnaire was used to collect data. An interview schedule was utilized for the qualitative strand. A research assistant was trained to help with the research. The online questionnaire was designed to ensure completeness of data collected before submission. All filled questionnaires were checked by the principal investigator for completeness.

3.6.2 Data Collection Procedure

An official list of Ophthalmologists and Non Physician Cataract Surgeons (NPCS) practicing in Kenya in the year 2019 was obtained from the Ministry of Health, Ophthalmic Services Unit (OSU). The mailing addresses and telephone numbers of the Ophthalmologists and NPCS who met the inclusion criteria were sought from OSU. Any missing contact details were extracted from additional registers obtained from the Ophthalmological Society of Kenya (OSK) and the Ophthalmic Clinical Officers Association of Kenya (OCOA). A link to a pre-tested, structured questionnaire was emailed or shared via whatsApp to all the Ophthalmologists and NPCS. A follow up email reminder was sent or telephone call made, or whatsApp reminder sent to those who did not respond immediately (within two weeks). For the qualitative data, key-informant interviews were conducted via telephone with purposively selected participants. For each interview, permission to record was obtained from the prospective participant, before commencing the recording. Notes were taken during the interviews. The interview recordings were transcribed into a text program. Analysis was done using NVivo software version 11. Data collection was done from 1st April to 3rd May 2020.

A sequential explanatory model was used during data collection. In this model, the quantitative strand is done first. Subsequently, the qualitative phase is done (Creswell, 2013). In such studies, the qualitative findings aid in contextualization of the quantitative data (Creswell, Plano-Clark, Gutmann and Hanson, 2003). According to Taylor and Trumbull, (2005), findings can be enhanced and enriched by qualitative data. This can

help generate new knowledge (Stange, 2006). In this study, 161 respondents participated in the online survey, followed by 32 key informant interviews with purposively selected participants from both cadres. The findings of the quantitative and qualitative strands were integrated during the interpretation/discussion phase of the study.

3.7 Research Quality Aspects: Reliability, Validity, and Objectivity of the study

In this study, quality was based on reliability, internal validity and external validity. Internal validity was inherent to the study and comprised Construct, Content and Face validity of the study instruments. Regarding generalizability of study results, the extent to which such results can be generalized is termed external validity (Saunders *et al.*, 2012). All eligible respondents had an equal opportunity of participating in the study to ensure the research findings are dependable.

3.7.1 Reliability of the Instrument

The study questionnaire was tested for reliability, which denotes the degree to which consistent results are produced by the study instruments, following repeated trials (Fairchild, 2002). In its simplest form, reliability refers to repeatability. The online questionnaire was first administered to a pilot group of 20 respondents who did not take part in the main study. In testing the reliability of the instrument, Cronbach's alpha was calculated and found to be 0.822. According to Field (2005), a Cronbach's alpha greater than 0.7 implies reliability of the instrument as a good measurement tool. The study questionnaire was therefore used to collect data from prospective participants.

3.7.2 Validity of the instrument

The term validity refers to the extent to which an instrument or a test measures that which it claims to measure. Construct validity examines if indeed the instrument measures the concept that it purports to measure. The questionnaire was reviewed for relevance of questions asked to ensure Construct validity. Content validity assesses an instrument's representativeness of all aspects of the construct. The questionnaire was examined to ensure that each specific objective was addressed by relevant questions. Face validity refers to the *prima facie* suitability of the contents of a study instrument. This validity test demonstrated to what extent the measures used correctly represented the study concept. Criterion validity which is a measure of concurrence examines whether results obtained

through a test correspond to a different test of the same thing (Middleton, 2019). This study did not claim Criterion validity.

For the Qualitative study, to ensure authenticity, credibility and fairness, all Key-informant interviews were recorded. Detailed notes were taken to enhance record keeping. These are kept for purposes of verification (referential adequacy). The recordings were transcribed and analyzed, following which verification was done by sharing the analysis and interpretations with the respondents for their concurrence (member checks). In writing the research report, the researchers endeavored to provide an accurate description of the research process in an attempt to enhance transferential validity/ transferability (Green, 2005).

3.8 Data Cleaning, Analysis and Presentation

The data collected was cleaned and coded in accordance with the objectives of the study as soon as the filled questionnaires were received. Completeness and logic of the answers; relevance as well as consistency of the responses with the set of objectives were verified. The online questionnaire was designed so as to minimize omissions and errors before submission. Qualitative data was analysed using Nvivo version 11. The responses obtained from the key informant interviews were coded. This was done by assigning them to categories and themes, in keeping with similar items in the questionnaire. Such responses were thereafter interpreted, taking cognisance of the consistency of facts, as well as logical themes. For the quantitative strand, Statistical Package for Social Sciences (SPSS version 23) was used to generate descriptive statistics for each objective. Such descriptive statistics included frequencies and percentages. Results were then presented in the form of tables, graphs and charts.

3.9 Ethical Considerations:

Ethical approval was obtained from the Strathmore University Institutional Ethics Review Committee (SU-IERC). A study permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI). Permission to conduct the study was also obtained from the Ophthalmic Services Unit, Ministry of

Health. The identity of the respondents was kept confidential during data collection and subsequent data management. Respondents were furnished with study information and assured that the study was only for academic purposes. Informed Consent was sought before the questionnaires were administered. All responses were treated confidentially. The respondents were assured that no harm would arise from participating in the study, and that they were free to withdraw from the study at any point in time, if they felt uncomfortable. Even though no direct benefits accrued to the respondents for participating in the study, they were encouraged to participate as the study was likely to add to the body of knowledge on task shifting. The filled questionnaires and interview recordings were only accessible to the investigators and the statistician. The questionnaires and interview recordings, transcriptions and analysis records will be maintained for 10 years following which they shall be destroyed.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.0 INTRODUCTION

This chapter discusses the analysis, presentation and interpretation of data collected on knowledge, attitude and practices regarding task shifting of eye care services in Kenya.
In the first part of the chapter, a report of the data according to the questionnaire responses coded by the researcher using the SPSS computer package is done. The data was collected from Ophthalmologists and NPCS working in Kenya.

The second part of the chapter is an analysis of the study findings as captured from the questionnaires and key informant interviews. The analysis was done conforming to the requirements of the qualitative and quantitative research paradigms. Qualitative data was analysed using Nvivo version 11. The responses were interpreted taking into account consistency of the facts, following which logical themes were adduced to them.

4.1 Response Rate

The composition of items in the main body of the two instruments used for data collection in this study varied widely. These items were derived from the four sub-sections of the problem selected for the study namely, the knowledge of Ophthalmologists and NPCS, the attitude of Ophthalmologists and NPCS, the practices of Ophthalmologists and NPCS regarding task shifting of eye care services and the role of task shifting, its merits, demerits, critical success factors as well as duration over which task shifting should be utilized in Kenya. In total, there were 267 prospective participants for the online questionnaire and 32 participants for the key informant interviews.

The study tools were designed and developed to collect the required information on four sub-themes of the study as stated above. Out of a possible 267 questionnaires, 161 were filled, giving a response rate of 60.3%. The response rate for the key informant interviews was 100%. The response rate for both instruments was considered high

enough, especially for the online study because as observed by Kerlinger (2006), a return rate of more than 60% is considered high enough in a survey study.

4.1.1 Demographic Data of the Participants

Before embarking on the main objectives of the study, it was important to understand the demographic characteristics of the respondents. Apart from providing credibility to the study findings, the demographic data also highlights important characteristics of the study sample with regard to specific common variables including cadre, sex, age, academic qualifications and current work place. These findings are presented in figures 4.1 to 4.5.

4.1.2 Distribution of Participants by Cadre

The study gathered data on participants' cadre which is summarized in figure 4.1.

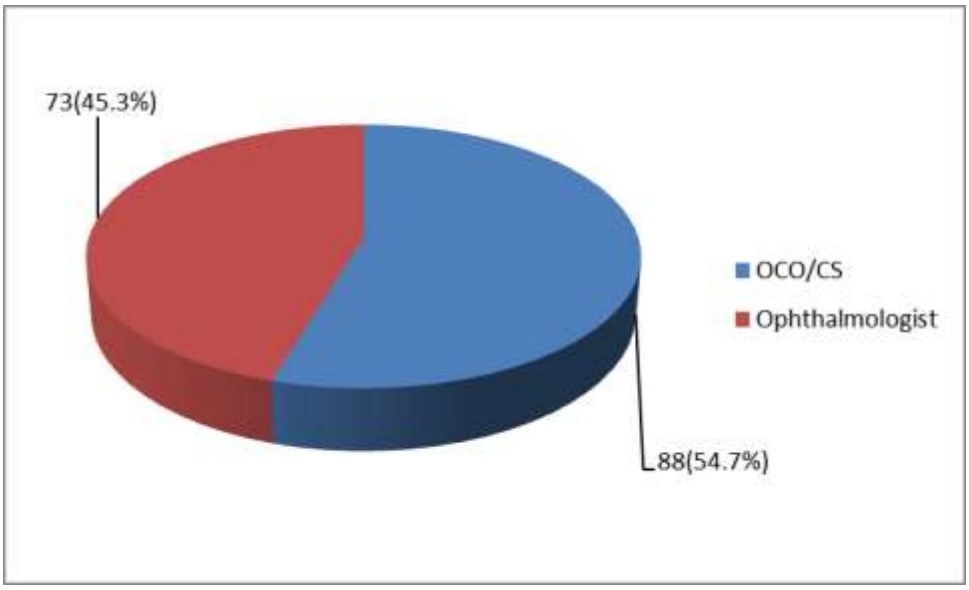


Figure 4.1: Participant Distribution by Cadre: (n=161)

From the data presented in figure 4.1, it clearly indicates that 88(54.7%) were Cataract surgeons while 73(45.3%) were Ophthalmologists. The results imply that most of the study participants were Cataract surgeons.

4.1.3 Sex Distribution of Participants

The study collected data on the sex distribution of the participants which is summarized in figure 4.2.

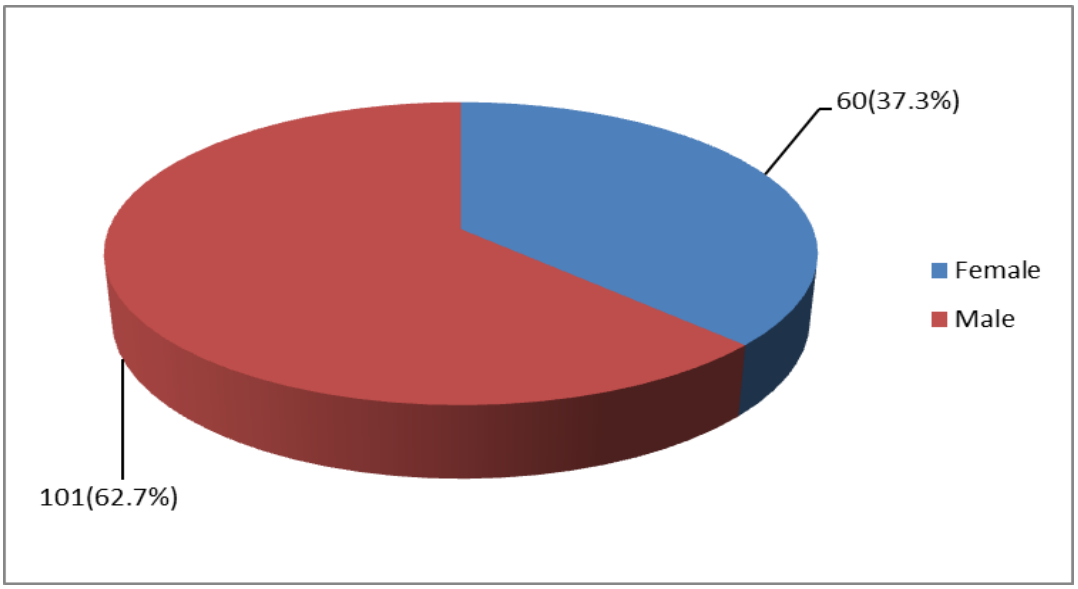


Figure 4.2: Sex Distribution: (n=161)

The majority of respondents as indicated in figure 4.2 were males 101(62.7%) while 60(37.3%) were females.

4.1.4 Distribution of participants by Age

Figure 4. 3 shows age ranges of the study participants.

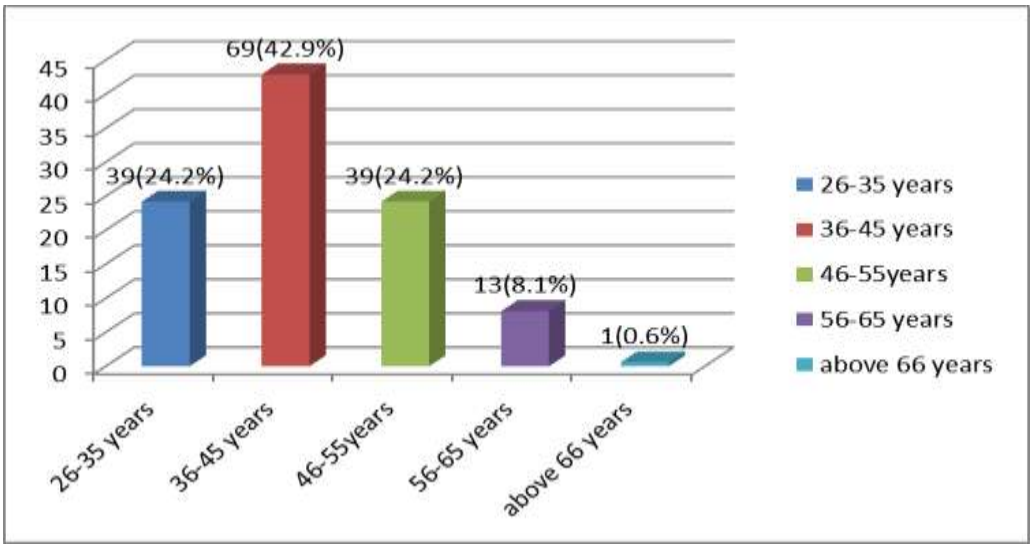


Figure 4.3: Distribution of Participants by Age: (n=161)

From the findings presented in figure 4.3, majority of the participants 69(42.9%) were within the age bracket of 36-45 years, 39(24.2%) of the participants were within the age bracket of 26-35 years, 39(24.2%) of the participants were within the age bracket of 46-

55 years, 13(8.1%) participants between 56-65 years while only one participant 1(0.6%) was above 66 years.

4.1.5 Academic qualifications of participants (n=161)

The study also gathered data on respondent's professional qualifications which is presented in figure 4.4.

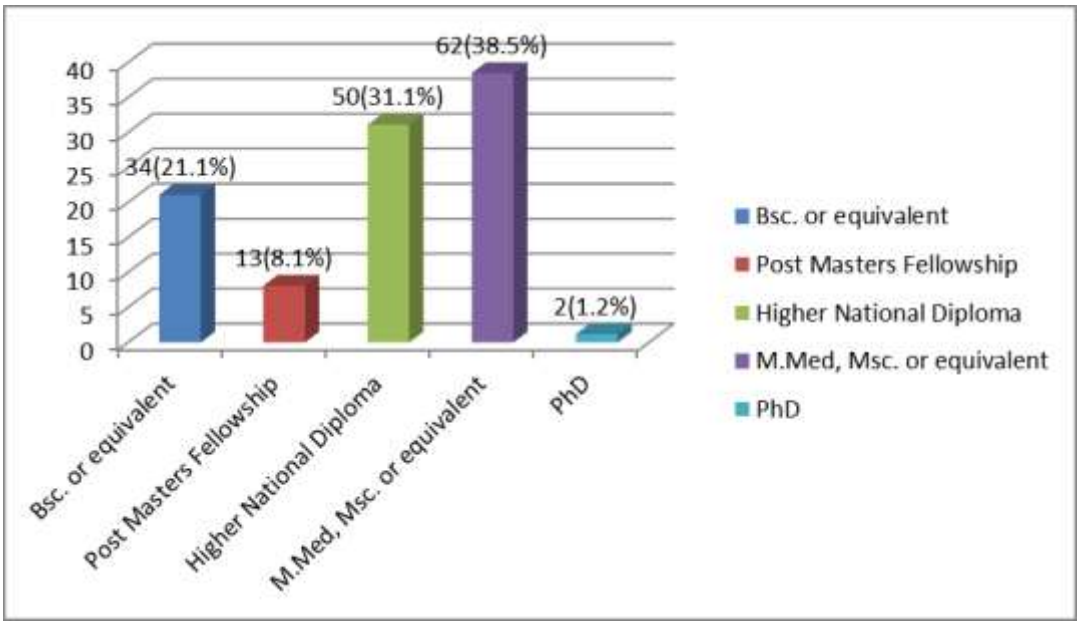


Figure 4.4: Academic Qualifications of Participants: (n=161)

Regarding the academic qualifications of the participants, the analysis demonstrates that 50(31.10%) of the participants were Higher National Diploma holders, 34(21.10%) were Bsc. or equivalent holders, 62(38.50%) of the participants were M.Med, Msc. or equivalent holders, 13(8.10%) were post Masters fellowship holders while 2(1.20%) were PhD holders. The results reveal that most of the participants were M.Med, Msc. or equivalent holders. These results indicate that the study participants possessed the relevant qualifications that would enable them effectively carry out their duties. This is in agreement with a study by Ogunu (2005) in Nigeria, which found that educational staff possessing higher academic credentials exhibited higher confidence at the workplace. Similarly, they were more likely to access quality information, in addition to exhibiting adaptability to dynamic conditions, compared to staff with lower qualifications.

4.1.6 Work Experience (in years) as an Ophthalmologist/ OCO/CS

Apart from academic qualifications, work experience of Ophthalmologists/OCO/CS is equally important. The data on work experience of these categories of participants is reported in table 4.1.

Table 4.1: Work Experience (in years) as an Ophthalmologist/ OCO/CS: (n=161)

	Frequency	Percent
0-5 years	53	32.9
6-10years	54	33.5
11-15years	13	8.1
16-20years	19	11.8
21-25 years	11	6.8
26-30 years	7	4.3
above 31years	4	2.5
Total	**161**	**100.0**

Results in Table 4.1 show that most of the participants 54(33.5%) had worked for between 6-10years, 53(32.9%) worked for between 0-5years, 19(11.8%) worked for between 16-20 years, 13(8.1%) had worked for between 11-15years, 11(6.8%) had worked for between 21-25 years, 7(4.3%) had worked for between 26-30 years while 4(2.5%) had worked for above 31 years. Work experience of the Ophthalmologists and the OCO/CS was important since those who had worked for long were assumed to be equipped with skills necessary for addressing the eye care challenges.

4.1.7 Current Workplace

The study also collected information on the current workplace of the participants. Results are displayed in figure 4.5.

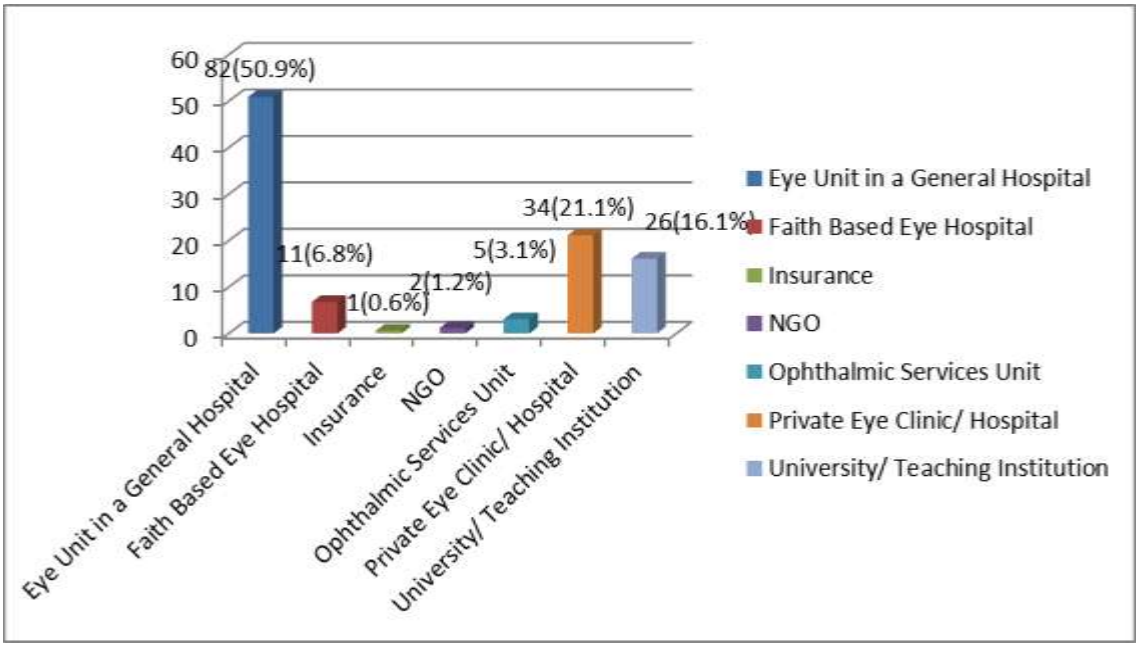


Figure 4.5: Current Workplace of Participants: (n=161)

On the current work place of the subjects, the analysis demonstrates that majority 82(50.9%) of the participants worked in an Eye unit in a General hospital, 34(21.1%) worked in a Private eye clinic, 26(16.1%) worked in a University/Teaching institution, 11(6.8%) worked in Faith based eye hospitals, 5(3.1%) worked in the Ophthalmic Services Unit, 2(1.2%) worked in an NGO and private Eye clinic while one 1(0.6%) worked in the Insurance industry. Regarding other cadres in existence where they worked, 63.4% of the NPCS worked in a set up where there was an Ophthalmologist while the rest 36.6% worked alone or with other lower cadres.

4.2 Knowledge of Ophthalmologists and Non Physician Cataract Surgeons in Kenya Regarding Task Shifting of Eye Care Services

Objective one was to determine the knowledge of Ophthalmologists and NPCS in Kenya regarding task shifting of eye care services. Results are presented in table 4.2.

Table 4.2: Regarding Knowledge about Task Shifting (n=161)

	Strongly disagree		Disagree		Don't Know		Agree		Strongly agree	
	Fre	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**
Heard about / know about task shifting of eye care services.	7	4.3	13	8.1	36	22.4	35	21.7	70	43.5
Task shifting is a process where specific tasks are moved, to health workers with shorter trainings and fewer qualifications.	10	6.2	6	3.7	25	15.5	39	24.2	81	50.3

*Fre = Frequency.

The study sought to enquire from the participants if they had heard about or knew about task shifting of eye care services. From table 4.2 majority of the participants 105(65.2%) agreed that they knew about task shifting, 36(22.4%) were undecided while 20(12.4%) disagreed that they had heard about/ knew about task shifting of eye care services. On enquiring from the participants if they were aware that task shifting is a process where specific tasks are moved where possible to health workers with shorter trainings and fewer qualifications, 120(74.5%) agreed, 25(15.5%) were undecided while 10(6.2%) disagreed. From the results majority of the participants had knowledge about task shifting.

4.2.1 Tasks that may be shifted in Eye Care Service Delivery

Regarding the tasks that may be shifted in eye care service delivery in Kenya, several items were designed and included in the online questionnaire. The information sought yielded the results shown in table 4.3.

Table 4.3: Tasks that may be shifted in Eye Care Service Delivery (n=161)

	Strongly disagree		Disagree		Don't Know		Agree		Strongly agree	
	Fre	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**
Eye care tasks like small incision cataract surgery may be shifted to OCO/CS.	7	4.3	9	5.6	16	9.9	19	11.8	110	68.3
Eye care tasks like visual acuity assessment may be shifted to Ophthalmic nurses.	6	3.7	3	1.9	14	8.7	19	11.8	119	73.9
Eye care tasks like refraction and spectacle prescription may be shifted to OCO/CS.	17	10.6	15	9.3	32	19.9	31	19.3	66	41.0
Eye care tasks such as screening for diabetic retinopathy may be shifted to OCO/CS.	14	8.7	9	5.6	22	13.7	28	17.4	88	54.7

*Fre = Frequency.

The analysis of the data collected on this item "eye care tasks including small incision cataract surgery may be shifted to OCO/CS" indicates that 129(80.1%) agreed, 16(9.9%) disagreed while a similar proportion of 16(9.9%) of the participants were undecided.

On analyzing item 4 that states that " eye care tasks like visual acuity assessment may be shifted to Ophthalmic nurses" it was found that majority of the respondents 138(85.7%) agreed, 14(8.7%) were undecided while only 9(5.6%) disagreed.

Analysis of item 5 on shifting of eye care tasks like refraction and spectacle prescription to OCO/CS shows that 97(60.2%) agreed that such tasks can be shifted OCO/CS, 32(19.9%) were undecided, while 32(19.9%) disagreed.

Item 6 sought to establish if eye care tasks such as screening for diabetic retinopathy may be shifted to OCO/CS. Majority of the participants 116(72.0%) agreed that it can be shifted, 23(14.3%) disagreed while 22(13.7%) were undecided. These results were echoed by the key informant interview participants agreeing with the same. Participant 18 retorted:

"...Some parts of patient tasks can be shifted. Like taking vision, eye pressure measurement and trachoma surgeries can be done by lower cadre, with training. We also have in the West eye injections being given by Ophthalmic nurses. This is not done here in Kenya. Even checking for diabetic retinopathy using the retinal camera doesn't need the Ophthalmologist as a trained technician can do that."

Participant 8 concurred:

"Eye irrigation, visual acuity examination and also examination of the eye pressure. They aren't technical and you just need a few days to train whoever you are training."

Participant 12 added:

"A good example is the screening of the diabetic patients. Any of them is likely to develop an eye related disease. Let's say we train people in the Diabetic Clinic so that they are able to take care of some eye tasks in the Department instead of sending them to the Eye Clinic. By so doing, they screen more patients and reduce work load."

4.3 Attitude of Ophthalmologists and Non Physician Cataract Surgeons Regarding Task Shifting of eye Care Services.

Objective two was to determine the attitude of Ophthalmologists and NPCS in Kenya regarding task shifting of eye care services. Several items were analyzed in assessing the attitudes towards task shifting at the work place. These included whether task shifting was necessary, if they shifted tasks and if it had been useful to their Ophthalmic practice.

Additionally, the investigators assessed the attitude towards tasks that may be shifted, and possible reasons why participants may not be willing to shift some tasks to other cadres. Results are shown in table 4.4, 4.5 and 4.6.

Table 4.4: Regarding Task Shifting at the Workplace (n=161)

	Strongly disagree		**Disagree**		**Don't Know**		**Agree**		**Strongly agree**	
	Fre	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**
Task shifting of eye care services is necessary.	6	3.7	5	3.1	19	11.8	31	19.3	100	62.1
I do shift some eye care tasks to other cadres of eye care workers.	5	3.1	8	5.0	20	12.4	37	23.0	91	56.5
Task shifting has been useful to my Ophthalmic practice.	6	3.7	10	6.2	18	11.2	32	19.9	95	59.0

*Fre = Frequency.

Analysis of data collected on the item "task shifting of eye care services is necessary" shows that 131(81.4%) of the participants agreed that it was necessary to shift eye care tasks, 19(11.8%) participants were undecided while 11(6.8%) disagreed.

Another item on attitude involved asking participants if they did shift some eye care tasks to other cadres of eye care workers. Results in table 5 reveal that majority of the participants 128(79.5%) agreed that they shifted their task to lower cadres, 20(12.4%) were undecided while 13(8.1%) didn't shift tasks to lower cadres. Additionally, the study sought to establish if task shifting had been useful to the participants' Ophthalmic practice. From table 5 it is observed that 127(78.9%) agreed that task shifting had been useful to their Ophthalmic practice, 18(11.2%) were undecided while 16(9.9%) said that

task shifting hadn't been useful to their Ophthalmic practice. This was corroborated by results from the interviews with Participant 9 echoing:

"….Better eye care and like my facility; you know my facility is under the University and other groups are using it. So, the first benefit is serving patients in the shortest time possible. Like today, I'm working alone with someone who has done on job training. Another benefit I have seen is that there are some staff who have done on job training but after one year they upgrade and have an interest in eye care."

Table 4.5: Attitude Regarding Eye Care Tasks that May Be Shifted (n=161)

	Strongly disagree		**Disagree**		**Don't Know**		**Agree**		**Strongly agree**	
	Fre	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**
Medical tasks such as treatment of allergic conjunctivitis may be shifted to OCO/CS.	9	5.6	7	4.3	16	9.9	24	14.9	105	65.2
Surgical tasks such as small incision cataract surgery may be shifted to OCO/CS.	8	5.0	10	6.2	20	12.4	20	12.4	103	64.0
Optical (refractive error correction) tasks may be shifted to OCO/CS.	10	6.2	13	8.1	30	18.6	32	19.9	76	47.2
Social tasks (patient education & counseling) may be shifted to Ophthalmic nurses.	5	3.1	3	1.9	10	6.2	25	15.5	118	73.3
Teaching of Eye health workers may be shifted to OCO/CS.	16	9.9	12	7.5	31	19.3	27	16.8	75	46.6
Management tasks may be shifted to OCO/CS.	24	14.9	15	9.3	29	18.0	26	16.1	67	41.6

Results on table 4.5 above show that most of the participants 129 (80.1%) agreed that medical tasks such as treatment of allergic conjunctivitis may be shifted to OCO/CS, 16 (9.9%) disagreed while 16 (9.9%) were undecided. On enquiring if surgical tasks such as small incision cataract surgery may be shifted to OCO/CS, 123(76.4%) of the participants agreed that such tasks may be shifted to OCO/CS, 20(12.4%) were undecided while 18(11.2%) disagreed. Further analysis of an item on shifting of Optical (refractive error correction) tasks to OCO/CS revealed that 108(67.1%) agreed that it can be shifted, 30(18.6%) were undecided on it while only 23(14.3%) of the participants disagreed that such tasks can be shifted to lower cadres. Regarding whether social tasks (patient education & counseling) may be shifted to Ophthalmic nurses, the following results were obtained: majority 143(88.8%) of the participants agreed that such tasks may be shifted to Ophthalmic nurses, 10(6.2%) were undecided while 8(5.0%) disagreed. Regarding attitude of participants towards shifting of teaching of eye health workers to OCO/CS, majority of the participants 102(63.4%) agreed to it, 31(19.3%) were undecided while 28(17.4%) disagreed that teaching of Eye health workers may be shifted to OCO/CS. Task shifting of management tasks to OCO/CS was analyzed. From the results on table 4.5, 93(57.8%) agreed that management tasks may be shifted to OCO/CS, 39(24.2%) disagreed while 29(18.0%) were undecided on whether or not to shift management tasks to OCS/CS.

Table 4.6: Reasons Regarding Tasks I would not Shift to other Cadres (n=161)

	Strongly disagree		Disagree		Don't Know		Agree		Strongly agree	
	Fre	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**
No felt need for task shifting.	44	27.3	29	18.0	27	16.8	23	14.3	38	23.6
Perceived incompetence of the other cadres.	37	23.0	14	8.7	37	23.0	36	22.4	37	23.0
Poor patient management outcomes from other cadres.	36	22.4	13	8.1	41	25.5	36	22.4	35	21.7
Unsure of the training of the other cadres.	33	20.5	17	10.6	36	22.4	30	18.6	45	28.0
Risk of litigation arising from task shifting.	24	14.9	19	11.8	32	19.9	30	18.6	56	34.8
No legal framework to supervise other cadres.	28	17.4	11	6.8	23	14.3	29	18.0	70	43.5

*Fre = Frequency.

On average 73 (45.3%) of the participants as shown in table 4.6 disagreed with the statement that "no felt need" was a reason for them not to shift tasks, 61(37.9%) agreed while 27(16.8%) were undecided. Regarding "perceived incompetence of the other cadres", 73(45.3%) agreed they would not shift tasks due to incompetence of other cadres, 51(31.7%) disagreed while 37(23.0%) were undecided.

Another item that was analyzed on why one would not shift tasks was poor patient management outcomes from other cadres. Results on table 4.6 show that 71(44.1%) agreed, 49(30.4%) disagreed while 41(25.5%) were undecided. Participants were also asked if being unsure of the training of the other cadres would make them not shift some

tasks. From the results, 75(46.6%) agreed that being unsure of the training of other cadres makes one not to shift tasks, 50(31.1%) disagreed while 36(22.4%) were undecided. Regarding risk of litigation arising from task shifting being a reason for not shifting some tasks, 86(53.4%) agreed, 43(26.7%) disagreed while 32(19.9%) were undecided. The results also indicated that lack of legal framework to supervise other cadres has been a hindrance to task shifting with majority of the participants 99(61.5%) agreeing to it, 39(24.2%) disagreed while 23(14.3%) were undecided. Results from the key informant interviews showed similar findings. Participant 4 said:

"*I think it depends on the level of training, and also the type of eye disease you are dealing with, complexity and also training and capacity of that particular cadre.*

Participant 9 added: *"Like the tasks that are complicated I won't be comfortable to shift to someone I have just trained; it can be mismanagement of a patient."*

Participant 15 reflected on his experience and said:

"….Without adequate training they can't handle task shifting. Incompetence will make me not to shift tasks to staff that are actually not able to carry out the tasks. Another reason is the policies that surround the eye care service."

Other participants said that not being accountable and production of poor quality work can make one not to shift tasks. Participant 16 reported:

"Accountability reasons and concerns about quality of work will make me not to shift tasks to lower cadres."

Participant 18 would be cautious about shifting tasks to other cadres for the following reasons:

"...If the cadres are already overwhelmed by other jobs; if they aren't motivated; if there will be no monitoring and evaluation."

Participant 14 cited medico-legal issues as the main reason that would prevent him from shifting some tasks. He commented:

"The main reason would be legal issues. For example, as a Clinical Officer I can do cataract surgery well aware that I'm protected by law. You can't delegate cataract surgery to a nurse because the Nursing Act will not allow it."

4.4 Practices of Ophthalmologists and NPCS in Kenya Regarding Task Shifting of Eye Care Services.

Objective three was to determine the practices of Ophthalmologists and NPCS in Kenya regarding task shifting of eye care services. To achieve this objective several items were analyzed and results are shown in table 4.7.

Table 4.7: Task Shifting as Currently Practiced in Kenya (n=161)

	Strongly disagree		Disagree		Don't Know		Agree		Strongly agree	
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%
My workplace implements a Policy on task shifting/ task sharing.	38	23.6	25	15.5	43	26.7	26	16.1	29	18.0
There are Guidelines to facilitate task shifting at my workplace.	75	46.6	24	14.9	32	19.9	21	13.0	9	5.6
I have received training to facilitate/ supervise task shifting at the workplace.	90	55.9	27	16.8	22	13.7	5	3.1	17	10.6
I do delegate some tasks to another cadre.	10	6.2	12	7.5	23	14.3	39	24.2	77	47.8
I do supervise tasks shifted to another cadre.	13	8.1	13	8.1	25	15.5	47	29.2	63	39.1
I do monitor outcomes of tasks shifted.	14	8.7	13	8.1	33	20.5	40	24.8	61	37.9
I am satisfied with outcomes of tasks shifted.	8	5.0	16	9.9	37	23.0	63	39.1	37	23.0
I do take responsibility in case of poor outcomes of tasks shifted.	11	6.8	15	9.3	34	21.1	43	26.7	58	36.0
I do take remedial measures in case of poor outcomes for tasks shifted.	10	6.2	10	6.2	30	18.6	45	28.0	66	41.0
I would wish to have leadership training to enable me supervise other cadres.	6	3.7	4	2.5	18	11.2	36	22.4	97	60.2

*Fre = Frequency.

As observed from table 4.7, analysis of the item on participants' workplaces implementing a Policy on task shifting/ task sharing, shows that 63(39.1%) of the respondents disagreed that they implemented a policy on task shifting/ task sharing , 55(34.2%) agreed that they have a policy, 43(26.7%) were not sure if they had a policy or not. Additionally, the researcher sought to find out if eye care facilities had Guidelines to facilitate task shifting at the workplace. From the results, majority of the participants 99(61.5%) disagreed that they had Guidelines, 32(19.9%) were not sure if they had while 30(18.6%) agreed that they had Guidelines. Regarding participants receiving training to facilitate/ supervise task shifting at the workplace, majority of the participants 117(72.7%) had not received any such training, 22(13.7%) were not sure while 22(13.7%) agreed that they received training. Participants were asked if they delegated some tasks to other cadres. Majority of the Ophthalmologists and NPCS 116(72.0%) agreed that they delegated tasks to other cadres, 23(14.3%) of participants were not sure while 22(13.7%) disagreed that they shifted tasks to another cadre. Most of the participants 110(68.3%) agreed that that they supervised tasks shifted to other cadres, 25(15.5%) were not sure while 26(16.1%) disagreed.

In addition to the above, the study sought to find out if the participants monitored outcomes of tasks that were shifted. From the results in table 4.7 majority of the respondents 101(62.7%) agreed that they monitored outcomes of the tasks that were shifted, 33(20.5%) were not sure if they monitored while 27(16.8%) disagreed. Concerning satisfaction with outcomes of tasks shifted, results show that majority 100(62.1%) agreed, 37(23.0%) were not sure while 24(14.9%) disagreed that they were satisfied with the outcomes of tasks shifted.

Participants were asked if they took responsibility in case of poor outcomes of tasks shifted. This yielded the following results: 101(62.7%) agreed that they took responsibility in case of poor outcomes of tasks shifted, 34(21.1%) were not sure while 26(16.1%) of the participants disagreed.

4.5 Potential Benefits of Task Shifting

Regarding the main benefits of task shifting in the eye health system, the responses from the participants are presented in table 4.8.

Table 4.8: Potential Benefits of Task Shifting (n=161)

	Strongly disagree		disagree		Don't Know		agree		Strongly agree	
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%
Delivery of eye care services at lower cost.	9	5.6	2	1.2	15	9.3	27	16.8	108	67.1
Reaching underserved/ remote populations.	3	1.9	1	.6	11	6.8	25	15.5	121	75.2
Earlier/ prompt recognition of eye problems.	2	1.2	2	1.2	16	9.9	29	18.0	112	69.6
Appropriate/ prompt referrals of eye patients.	3	1.9	0	0	17	10.6	28	17.4	113	70.2
Equitable distribution of eye health services.	5	3.1	7	4.3	19	11.8	29	18.0	101	62.7
Improved quality of service delivery.	7	4.3	11	6.8	27	16.8	39	24.2	77	47.8

*Fre = Frequency.

The analysis of the above items demonstrates a number of benefits that lead to efficiency in eye care service provision. Majority of the respondents 135(83.9%) agreed that delivery of eye care services at a lower cost is a benefit of task shifting, 15(9.3%) were undecided while 11(6.8%) disagreed. The key informant interview participants supported lower costs as a benefit of task shifting. Participant 14 reported:

"One benefit is cost savings, especially where there is a proper skills-mix amongst the cadres."

He opined that such cost savings can then be transferred to the patients in the form of more affordable user fees.

Analysis of the item on reaching underserved/ remote populations by use of task shifting shows that majority of the participants 146(90.7%) agreed that task shifting makes eye care services to reach underserved and remote populations, 11(6.8%) were undecided

while 4(2.5%) disagreed. Key informant interview participants also felt the same. Participant 1 said:

"…*You save time and reach more people. I think services will reach many places as compared to if only an individual was carrying out tasks."*

Participant 16 added:

"A wider Kenyan population will be able to access the eye care services, especially in the rural areas."

On enquiring from the participants if shifting of tasks to other cadres led to earlier/ prompt recognition of eye problems, 141(87.6%) agreed, 16(9.9%) disagreed while 4(2.5%) were undecided. Another benefit of task shifting according to the study participants was having appropriate /prompt referrals of eye patients. From table 8, majority of the participants 141(87.6%) agreed that task shifting led to prompt referrals of eye patients, 17(10.6%) were undecided while 3(1.9%) disagreed. Equitable distribution of eye health services as a benefit was analyzed. From the results, 130(80.7%) agreed to it, 19(11.8%) were undecided while 12(7.5%) disagreed. Regarding improved quality of service delivery, most of the participants 116(72.0%) agreed, 27(16.8%) were undecided while 18(11.2%) disagreed on delivery of quality services. Participant 10 added:

"*Task shifting leads to team work, harmonization of work, efficiency of services, improved service delivery and shared work load."*

4.6 Challenges Attributable to Task Shifting of Eye Care Services in Kenya

The study sought to find out from the Ophthalmologists and NPCS the challenges that are attributable to task shifting of eye care services as currently practiced in Kenya. Results are shown in table 4.9.

Table 4.9: Challenges Attributable to Task Shifting of Eye Care Services as Currently Practiced in Kenya (n=161).

	Strongly disagree		Disagree		Don't Know		Agree		Strongly agree	
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%
Quality of service delivery by the cadres to whom tasks are shifted is a major concern.	12	7.5	20	12.4	31	19.3	44	27.3	54	33.5
Unclear scope of practice is a major concern.	16	9.9	8	5.0	30	18.6	30	18.6	77	47.8
Compensation/ remuneration of cadres to whom tasks are shifted is a major concern.	9	5.6	7	4.3	30	18.6	45	28.0	70	43.5
Lack of adequate legislation is a major concern.	14	8.7	7	4.3	25	15.5	29	18.0	86	53.4
Lack of requisite training of Ophthalmologists in their support supervision role is a major concern.	13	8.1	9	5.6	32	19.9	40	24.8	67	41.6
Lack of a clear scheme of service is a major concern	14	8.7	7	4.3	27	16.8	33	20.5	80	49.7

*Fre = Frequency.

Quality of service delivery by the cadres to whom tasks are shifted being a major concern was analyzed and it yielded these results: 98(60.9%) agreed on it, 32(19.9%) disagreed while 31(19.3%) were undecided. Analysis of the item on unclear scope of practice being a major concern revealed that 107(66.5%) agreed to it, 30(18.6%) were undecided while 24(14.9%) disagreed. Compensation/ remuneration of cadres to whom tasks are shifted being a major concern was also examined and results revealed that majority of the participants 115(71.4%) agreed, 30(18.6%) were undecided while only 16(9.9%) disagreed that compensation/remuneration of cadres to whom tasks are shifted was a major challenge attributable to task shifting. Lack of adequate legislation was found to be one of the challenges with 115(71.4%) agreeing to it, 25(15.5%) of the participants were

undecided while 21(13.0%) disagreed that lack of adequate legislation was one of the challenges that faced task shifting in Kenya.

Still on challenges facing task shifting in Kenya, an item pertaining to lack of requisite training of Ophthalmologists in their support supervision role being a major challenge revealed that 107(66.5%) of the participants agreed, 32(19.9%) were undecided while only 22(13.7%) disagreed that training was a challenge. Another item that was analyzed on challenges was lack of a clear scheme of service and results revealed that majority of the participants 113(70.2%) agreed, 27(16.8%) were undecided while 21(13.0%) disagreed. Participants of the key informant interview brought up several challenges, some supporting the above. Participant 15 said;

"One of the challenges is a negative attitude mostly related to a specific cadre. There's also lack of remuneration. Another challenge is unnecessary competition. If you have competition between different cadres it will prohibit task shifting. Again lack of adequate training; you will want to shift some task but the person you are shifting to has no training, thus being a challenge. Another challenge is the laws that we have don't protect us; we have some laws that prohibit others from doing other tasks. Additionally, we have some cadres that the policy limits their jobs. Lack of proper technology may also limit task shifting."

Participant 16 added;

"There is no willingness to teach the other cadre. In addition, there is lack of resources for training. Some institutions have inter-cadre fights, sustainability issues and lack of accountability."

Participant 17 believed that the major challenge was lack of training:

"The *challenges include lack of training, inadequate services, lack of medical equipment and trained cadres thus reducing performance and quality."*

One participant brought up the issue of lack of monitoring and evaluation as well as lack of supervision. Participant 18 retorted:

"One challenge is that given a new task which they think they are capable of doing, especially when it comes to quality, when there is no monitoring, they are left to perform on their own and that's all, thus not bringing out the work perfectly. Another challenge is that resources are not allocated together with task shifting for them to perform other duties so performing an extra job becomes an overload of work and this affects efficiency of service delivery."

4.7 Role of task shifting and critical success factors of task shifting in Kenya.

The last objective was to find out the role of task shifting and critical success factors of task shifting in Kenya. Findings are discussed below:

Table 4.10: Factors That Need To Be Considered For Task Shifting Of Eye Care Services to Succeed (n=161)

	Strongly disagree		**Disagree**		**Don't know**		**Agree**		**Strongly agree**	
	Fre	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**	**Fre**	**%**
Enactment of legislation governing task shifting of healthcare services.	11	6.8	4	2.5	21	13.0	26	16.1	99	61.5
Training of lower cadres of eye health workers in readiness for additional tasks.	6	3.7	0	0	17	10.6	23	14.3	115	71.4
Training of Ophthalmologists in preparation for their role in task shifting.	9	5.6	2	1.2	24	14.9	30	18.6	96	59.6
Establishment of standards and regulations for additional roles of the lower cadres.	5	3.1	3	1.9	11	6.8	24	14.9	118	73.3

*Fre = Frequency.

The analysis of item 7 citing enactment of legislation governing task shifting of healthcare services revealed that 125(77.6%) agreed that it is a factor that should be put in place for task shifting to succeed, 21(13.0%) were undecided, while 15(9.3%)

disagreed. Further scrutiny of table 4.10 regarding training of lower cadres of eye health workers in readiness for additional tasks revealed that majority of the participants 138(85.7%) agreed, 17(10.6%) were undecided while 6(3.7%) strongly disagreed that it is a factor to consider for task shifting to succeed.

Training of Ophthalmologists in preparation for their role in task shifting was analyzed as a factor. Results indicated that most of the participants 126(78.2%) agreed on it, 24(14.9%) were undecided while only 11(6.8%) disagreed. Establishment of standards and regulations for additional roles of the lower cadres as a factor revealed that most of the participants 142(88.2%) agreed, 11(6.8%) were undecided while 8(5.0%) disagreed. These results concur with those obtained from the interviews.

Participant 13 reported:

"Yes, one has to have the background and be trained. There must be equipment to do the work and infrastructure in terms of space. One has to appreciate cataract surgery and have a working theatre and equipment. Eye care is team work and it's not only one cadre that can make it a success. You cannot deliver alone; the Ophthalmologist will need someone to work with. Eye care is a service that hasn't been explored a lot; so we are still far from saying we cannot shift tasks. Ophthalmologists are concentrated in towns and Cataract surgeons are in the community."

Participant 10 added:

"First is availability of equipment and improved infrastructure. One should ensure that the facility is equipped and you are able to put the cadres there. There should be availability of funds as well as embracing emerging technology; as an institution you should take the cadres for training, actually proper training".

From these results on factors it is implied that for the success of task shifting several considerations should be taken into account, including, among other factors: equipment availability, infrastructure upgrade, enough staff, availability of funds and adoption of emerging technology.

Participant 18 proposed:

"One factor is acceptance by stakeholders; they need to see it as a viable way of doing things. Two is to have motivated staff to take up new tasks. Monitoring and evaluation is important to maintain quality of tasks shifted. The staff need to be interested in taking on an extra task. The staff will ask if they will be paid to do the new task; if they will have tools to do the tasks and if there will be someone to consult in case they get stuck."

The participants were asked if task shifting had a role in the provision of eye care services in Kenya and 31 out of 32 key informant interview participants agreed that it did. They reasoned that because there were always a large number of patients and just a few Consultants Ophthalmologists to serve them, task shifting then was necessary. Some participants also reported that the few available Ophthalmologists were stationed mainly in urban areas hence the rural areas were underserved. It was also mentioned that task shifting had a role in that patients were able to be identified earlier and referred accordingly thus leading to earlier treatment. Another role that was brought forth was that when tasks are shifted eye care services can be rolled down to the community level thus early identification of patients.

Participant 6 highlighted;

> *"Yes it does have a role, for example when you have a lot of patients, you need to give out some basic tasks that will help in assisting the patients; then you assign duties to people who have some knowledge; this is an example whereby you have an eye camp. I think you can give out tasks like visual acuity assessment to someone else."*

Participant 13 added;

"Yes it has a role in that eye care services need to be rolled down to the community level and our patients are able to be identified earlier and referred accordingly and the patient is treated early enough."

Participant 16 and 18 observed respectively;

"Yes it has a role; to ease the burden of the Ophthalmologist so he or she can concentrate on the most important tasks. This can be employed in remote areas where specialist eye care is scarce."

"*… aaah task shifting; yes it does have a role; reason being that the number of eye care workers and the more specialized ones i.e Ophthalmologists are very few in the country; meaning that the work that they are supposed to do is a lot, and can be shifted to the lower cadres as the Ophthalmologists do complicated work; so that it can lead to efficiency of work."*

Participant 19 added:

"Yes it has a role; the reason being that we don't have enough Ophthalmologists and Cataract surgeons in Kenya; so, for the staff to be able to deal with the work load, they should shift minor jobs to lower cadres."

Participant 26 reported:
"Yes, task shifting has a role in provision of eye care services; because not all eye care services can be done by the Ophthalmologists. Therefore, there is a role to distribute some services to other non-technical workers."

Participant 29 retorted:
"Yes it does have a role. Number one because we have very few Ophthalmologists. Even the few we have are not distributed evenly in the country; we have areas where people are in need of eye services but there are no Ophthalmologists and if we are able to train other cadres to carry out simple tasks then they can assist."

CHAPTER FIVE

DISCUSSION

5.0 INTRODUCTION

The shortage eye health personnel in Kenya makes it necessary for some tasks that are ordinarily done by Ophthalmologists to be shifted to other cadres. Relevant policies may not be in use in many eye care centres where task shifting is practiced. Task shifting is multifaceted and, as such, the respondents in this study articulated several perspectives. The common themes that emerged are considered in the context of the available literature. The study findings and support for various aspects are evaluated. The conclusion and recommendations for next steps and future research are presented in chapter six.

5.1 Interpretation

This study demonstrated that Ophthalmologists and Non Physician Cataract Surgeons believe that task shifting of eye care services in Kenya is needed, is possible and has the potential to address the shortage of eye care workers. Most of the participants 69(42.9%) were within the age bracket of 36-45 years with 62(38.50%) of the participants having Master of Medicine (M.Med), Master of Science (M.sc) or equivalent and 50(31.10%) being Higher National Diploma holders. This implies that participants in the study possessed the relevant qualifications that would enable them effectively carry out their duties. Ogunu (2005) in a study done in Nigeria, found that educational staff possessing higher academic credentials exhibited higher confidence at the workplace. Similarly, they were more likely to access quality information and showed adaptability to dynamic conditions compared to staff with less credentials. Most of the study participants 107(66.5%) had worked between 0-10years.

5.1.1 Knowledge of Ophthalmologists and NPCS in Kenya Regarding Task Shifting of Eye Care Services.

The study participants had knowledge about task shifting of eye care services with 105(65.2%) of the participants agreeing that they knew about or had heard about task

shifting. Task shifting as per this study is a practice involving delegation or redistribution of tasks. It entails movement of specific tasks, where suitable, to less specialized cadres with shorter trainings and fewer credentials. Most of the participants 120(74.5%) agreed with this definition. Regarding the tasks that may be shifted, shifting of small incision cataract surgery to OCO/CS was agreeable to 129(80.1%) respondents. Participants had knowledge that visual acuity assessment can be shifted to lower cadres with 138(85.7%) out of 161 participants agreeing to it. Other examples of tasks that participants were aware could be shifted included refraction and spectacle prescription 97(60.2%), and screening for diabetic retinopathy 106(65.8%). In comparison, in a cross-sectional mixed-methods study comprising a survey and in-depth interviews, done in Takeo Province in Cambodia, Shah *et al.* looked at roles of the eye care workforce for task sharing in management of diabetic retinopathy in Cambodia. The participants in the Cambodia study favoured the Ophthalmic nurses' potential role in screening for diabetic retinopathy in a task sharing model. A high demand for eye health services, coupled with paucity of Ophthalmologists, favoured task sharing in the Cambodia Study, just like in this study.

The key informant interviews revealed that task shifting acted as a link between different health care providers to ensure there is continuity of care to eye patients thus being beneficial to them. Tasks like visual acuity assessment, intra-ocular pressure measurement, preparation of the operating theatre for surgery, counselling and screening of the diabetic patients can be shifted to lower cadres.

5.2 **Attitude of Ophthalmologists and NPCS in Kenya Regarding Task Shifting of eye Care Services.**

Attitudes of the Ophthalmologists and Non-Physician Cataract Surgeons towards task shifting were mostly positive. Majority 131(81.4%) of the respondents knew about the importance of task shifting, they shifted some eye care tasks to other cadres of eye care workers 128(79.5%) and regarded task shifting as being useful to their Ophthalmic practice 127(78.9%). It is observed from the study that the Ophthalmologists and the Non Physician Cataract Surgeons were comfortable with shifting medical tasks such as treatment of allergic conjunctivitis 129(80.1%), surgical tasks such as small incision

cataract surgery 123(76.4%), optical (refractive error correction) tasks 108(67.1%), social tasks (patient education & counseling) 143(88.8%), teaching of Eye health workers 102(63.4%) and management tasks 93(57.8%).

The results from the key informant interviews were very positive about task shifting and singled out the fact that task shifting creates a link between patients and service providers in the eye care units in rural as well as urban locales. There is also the potential for expansion of eye care services through enhancing the role of mid-level and lower cadres of eye health workers which would help in extending eye care services to the community, hence improved access to eye health services.

On the contrary, the participants also felt that they would not be willing to shift tasks if they perceived incompetence of the other cadres 73(45.3%), if there was poor patient management outcomes from the other cadres 71(44.1%), if they were not sure of the training of the other cadres 75(46.6%), because of risk of litigation arising from task shifting 86(53.4%) and owing to no legal framework to supervise other cadres 99(61.5%). From the interviews the main concerns leading to a negative attitude were possible quality deterioration, lack of legal frameworks and the absence of proper training. These, in their view, were likely to lead to a decline in quality of eye health services.

Hale, Lewallen and Courtright, (2012) in their paper on task shifting in Primary Eye Care, singled out several challenges of task shifting to Primary Eye Care workers, with little knowledge of eye care. They recommended that, for task shifting to be successful at this frontline level, it should focus on such workers dealing with community-based eye health topics that are mainly preventive in nature, and knowing who, how and where to refer, for all the other eye problems. The more complex diagnosis and management are then left to the more specialized mid-level eye care personnel, in their view. Our study involved NPCS, who are dedicated eye-health workers, with formal training in eye health hence are expected to be able to handle more eye care tasks.

Courtright, Mathenge and Kello, *et al.* (2016), while referring to changing dynamics of eye diseases in Sub-Saharan Africa (need for specialized treatment of glaucoma and diabetic eye disease) as well as increasingly demanding patient needs (demand for early, high quality cataract surgery) coupled with complexity of eye care service delivery, opine that it does not make sense promoting the widespread use of NPCS, except in high volume centres that are well-run and are Ophthalmologist-led. In our study, 63.4% of NPCS worked with Ophthalmologists while 36.6% worked alone. There's thus room for support supervision, in a formal, organized task sharing environment. The eye health sector can leverage on technologies such as Portable Eye Examination Kit (PEEK) and tele-Ophthalmology amongst others, in providing support supervision to the NPCS who work alone.

Unlike in the Bergstrom, 2015 study, which reported an initial hesitancy and even objection to surgical task shifting among doctors, small incision cataract surgery being shifted to NPCS was agreeable to 76.4% of the study participants. This may be related to the knowledge of training of this cadre in Kenya, which focuses on cataract surgery.
Some of the key informants had reservations about optical tasks being shifted to NPCS. They cited doubtful practices by some providers such as prescribing spectacles to patients who don't need these, presumably for commercial benefits. This was the main reason for their reluctance.

5.3 Practices of Ophthalmologists and NPCS in Kenya Regarding Task Shifting of Eye Care Services.

According to WHO (2008) success of task shifting depends on paying attention to its successful implementation through supportive systems as well as providing the requisite eye health personnel. In summary of practices of Ophthalmologists and NPCS regarding task shifting of eye care services, 63(39.1%) of the respondents reported that their institutions had not implemented a policy on task shifting/ task sharing whereas 43(26.7%) were unaware if their workplace implemented any such policy. Lack of policy implementation definitely affects task shifting as there is no policy that governs the cadres in terms of day to day operations and in case an assignment goes wrong. There

was lack of guidelines to facilitate task shifting at most workplaces 99(61.5%). Most of the participants 99(61.5%) had not received training to facilitate or supervise task shifting at work. Tasks and outcomes of task shifting were monitored by both cadres. There was need for leadership training to enable Ophthalmologists and NPCS supervise other cadres. Participants said that as much as there is a proposed task sharing approach it shouldn't be directed at merely expanding the role of allied eye health workers but rather the focus should be on a team based approach to eye health service delivery, in which all cadres should share the work harmoniously, with each cadre performing the tasks they are best suited to do.

5.3.1 Benefits of Task Shifting

The findings highlighted six major benefits of task shifting to lower cadres. These included but were not limited to delivery of eye care services at lower costs with 135(83.9%) out of 161 participants agreeing to it. Expanding the reach of services to underserved/ remote populations was also found to be beneficial, where 146(90.7%) agreed that through task shifting, access to services by remote populations was enhanced. In addition, task shifting leads to a more equitable distribution of available human resource according to 130(80.7%) of the participants, with a critical positive impact on rural communities. This position was supported by most of the key informant interview participants who asserted that most of eye patients in Kenya live in rural areas yet the eye health workforce is concentrated in urban areas. They added that majority of rural populations are larger compared to urban populations within the country. Additionally the higher skilled eye health workers (Consultant Ophthalmologists) are based in major towns and in the cities; hence their services may not be readily accessed by the residents of rural communities. Other potential benefits included prompt recognition of eye problems 141(87.6%), appropriate referral of eye patients 141(87.6%) as well as improved quality of service delivery 116(72%).

Of the benefits cited in this study, delivery of services at lower costs compares favourably with the findings of Fulton *et al*. (2011) who reported that in district hospitals where surgical Assistant Medical Officers (AMOs) and Physician Obstetricians and

Gynecologists worked, the two groups had comparable patient outcomes. The AMOs attained such outcomes at a lower cost compared to their Physician colleagues.

Seidman and Atun (2017), in a systematic review of evidence from low and middle income countries, reported that task shifting results in lower costs and leads to improved efficiency for health systems.

In this study, 116 (72.0%) of participants felt that task shifting leads to improved quality of service delivery. These sentiments echo those of McCord and colleagues (2009) who in a retrospective study done in Tanzania, reported that no statistically significant differences existed in the post-operative outcomes, quality of care indicators as well as risk indicators for major obstetric surgeries done by Medical Officers and AMOs. In eye health, Yorston, *et al*. (2002), in a prospective trial monitoring cataract surgical outcomes, reported no significant differences between outcomes obtained by Ophthalmologists and Non Physician Cataract Surgeons.

5.3.2 Challenges Attributable to Task Shifting of Eye Care Services as Currently Practiced in Kenya

Major concerns about task shifting comprised shortage of trained eye health workers, quality of service delivery by the cadres to whom tasks are shifted, unclear scope of practice, compensation/ remuneration of cadres, lack of adequate legislation, lack of a clear scheme of service and insufficient coordination amongst health care workers and policy makers. Key informant interviews added that there are major challenges facing task shifting of eye care services in Kenya. These included inadequate training and supervision of recipients of shifted tasks, insufficient quality control checks as well as inadequate policy and regulatory environment. Other challenges mentioned included doubtful acceptability of task-shifting by some practitioners and policy-makers, lack of incentives and motivation as well as poor retention of some staff in their work stations. Some participants felt that applying task shifting to different eye care contexts such as government and privately owned facilities was also a challenge.

The sentiments regarding policy, regulation and support supervision were similar to those of the proponents of task shifting in the Baine and Kasangaki (2014) qualitative study

done in Uganda which argued that the lower cadres already performed tasks of professional health care providers hence the need to offer them support supervision and a requisite policy to recognize their contribution. In this Ugandan study, the opponents of task shifting viewed the lower cadre health care providers as incompetent and overworked. They added that, compared to employing fully trained professional staff, task shifting was more expensive.

5.4 Role of Task Shifting and Critical Success Factors of Task Shifting In Kenya

For many decades, eye care service delivery was mainly the work of NPCS and Ophthalmologists. Later it became clear, however, that in order to effectively manage the work load in eye care, other cadres would need to be developed, trained and deployed to work with and support the NPCS and Ophthalmologists. A team approach to eye care would therefore be essential. In this study, for the success of task shifting, several factors were proposed to be put in place. These included enactment of legislation governing task shifting of healthcare services, training of lower cadres of eye health workers in readiness for additional tasks, training of Ophthalmologists in preparation for their role in task shifting and establishment of standards and regulations for additional roles of the lower cadres.

Success of task shifting will depend not only on role expansion, but also on enhanced knowledge and skills of eye health providers. This can be done by offering various need-based trainings. Improved training programmes, support supervision as well as teamwork will be instrumental in achieving efficiency of service delivery under a task sharing model. Other pertinent issues, according to the key informant interview participants include provision of requisite equipment/infrastructure, use of appropriate technology such as Portable Eye Examination Kit (PEEK), financial and political commitment as well as a formal task sharing environment.

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In their view, the policy makers should not only focus on the quantity of the eye care workers but also on the quality of the work done as this is very important. The results echo those in Husainzada (2007) that asserts that both quantity of eye health providers

and quality of services offered are important in low resource countries as well. Courtright, Mathenge and Kello, *et al*. (2016) conclude that "Sub-Saharan Africa does not need nor deserve substandard eye care."

In this study, many respondents emphasized the need for training and continuous professional development. They highlighted that involvement of trained lower cadres with specified roles is an important factor that can be used to achieve success through task sharing given limited resources. More emphasis was put on equipment availability, infrastructure upgrade, staffing and availability of funds. The cadres should be motivated to have interest in taking of extra tasks and there should be remuneration for expanded roles in a task sharing approach. Programmes should embrace emerging eye health technologies such as the Portable Eye Examination Kit (PEEK) in implementing task sharing strategies.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 INTRODUCTION

Based on the study conducted, this chapter presents the conclusion and recommendations. Additionally, it presents recommendations for further research as identified during the conduct of the study.

6.1 Conclusion

In this study, participants understood what task shifting is and most of them had knowledge on task shifting. Most participants accepted task shifting approach and believed that in task sharing there would be enhanced access to eye health services all over the country. Task shifting has the potential to address the shortage of eye health workers, hence improving service delivery. To achieve this, the cadres should have well defined procedures and work effectively as a team. Adequate training of all cadres, monitoring and evaluation and supervision for eye care workers is critical so as to improve on their expertise before task shifting. This will lead to good quality of eye care services.

Cadres are sometimes given tasks or assume tasks exceeding their level of training and actual job descriptions. Adequate training before assigning of additional tasks is often lacking. Although some participants thought performing of additional tasks presented them with a learning opportunity, others found it to be burdensome and very stressful.

The task shifting logic as applied to eye care workers implies that other cadres can take over simpler tasks that Ophthalmologists perform. This has the potential to save time and money as well as improve the quality of service delivery. This is because the Consultant Ophthalmologists then perform more tasks that best fit their expertise. This leads to efficiency of service delivery. There should be consultation between cadres before shifting tasks to avoid inter-cadre conflicts. There needs to be identification of tasks that can be easily and safely shifted for this practice to be useful for eye health service delivery.

In summary, for Kenya to achieve sustainable improvement in eye health service delivery, it should involve preparing and protecting the key players, i.e all cadres in health care. The Ophthalmologists and NPCS interviewed in this study emphasized assessing the current needs and tailoring the educational initiatives accordingly. The importance of targeting the specific knowledge and skills needed by the cadres in a clinical area and then designing courses with a combination of pre-service, in-service, and on-the-job training to meet those needs was made clear by the participants. A compelling theme that emerged was the need for comprehensive policy framework governing eye care service delivery. The need for regulations was evident; that there should be laws that govern all cadres before task shifting of eye care services is done. Task shifting should be transparently and officially adopted. The practice of task shifting should be clearly defined. Curricula should be developed that prepare these cadres for the work they are expected to do. Regulations that support and protect all cadres engaged in task shifting should be in place. Equitable deployment and workload as well as fair remuneration for these cadres should be a priority in the countrywide strategic planning for eye health human resources, so as to meet the population's eye health needs.

6.2 Recommendations

This study recommends the following:

i) Though task shifting presents a useful approach to addressing shortage of eye care workers in Kenya, policy makers should carefully consider training more Ophthalmologists so as to cover the whole country including hard-to-reach areas.

ii) Allocation of eye care workers to urban and rural areas should reflect the population's eye health needs, taking cognizance of devolved health services.

iii) Policy makers and planners should identify critical areas for task sharing in the country. The existing National Policy on Task Sharing should be disseminated widely. It should be customized to suit local eye health task sharing needs.

iv) As trained eye health workers leave colleges and transition to clinical practice, a clear job description should be provided that includes shifted tasks and the routine work. The value that each cadres' work brings will be honoured when it is included in the workload discussion. Careful consideration should be

given to what tasks can be safely shifted, what cadre is best qualified to take on such tasks, as well as the skill-mix needed at an eye care set-up.

v) There should be mentorship and motivation of all cadres in eye care. Appropriate and adequate equipment and infrastructure as well as monitoring strategies should be put in place before any task shifting is done.

vi) Task shifting should be done as team work for it to succeed. Going forward, a number of key informants strongly recommend adoption of "teamwork" or "task sharing" as opposed to "task shifting". Under such a model, all cadres will feel empowered to undertake tasks in accordance with their training and experience, as team players. This should lessen inter-cadre competition and conflicts.

vii) Leadership trainings for Ophthalmologists should be encouraged to aid their role as mentors, managers and leaders in a formal task sharing environment.

viii) Develop more guidelines and standard operating procedures to govern formal task sharing.

6.3 Recommendations for further research

In consideration of several issues emerging from the research, the following areas are suggested for further study:

i. Economic evaluation of the task sharing approach to eye health service delivery: a cost-effectiveness analysis.

ii. Evaluating quality of surgical care in a task sharing model/ environment: a multi-centre cataract surgical outcome monitoring study; Randomized controlled Trial comparing outcome of cataract surgeries done by Ophthalmologists and NPCS.

iii. Training needs assessment in the context of task sharing for eye health (pre-service, in-service and continuous professional education).

iv. Application of technology to aid effective task sharing; the case of Portable Eye Examination Kit (PEEK) and tele-Ophthalmology.

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Appendices:

Appendix I: Letter of introduction to prospective study participants.

Participant Information Sheet and Consent Form.

Study Title: Knowledge, Attitude and Practices Regarding Task Shifting of Eye Care Services in Kenya.

Investigator: Ernest Ollando. Cell: 0726929971.

Study Sponsor: Self.

This informed Consent form has two parts:

I. **Information Sheet:** (to share information about the study with you).

II. **Certificate of Consent:** (for signatures if you choose to participate).

Part I: Information Sheet:

Dr. Ernest Ollando, an MBA Healthcare Management Student at Strathmore University Business School is carrying out research on Knowledge, Attitude and Practices Regarding Task Shifting of Eye Care Services in Kenya.

We are giving you this information because we'd like you to take part in the research project. Should you prefer to participate, you are free to do so. You are invited to take part freely and you have the right to participate or not. Your withdrawal from the study at any time is permissible, with no negative impact. Before deciding to participate in the research, it is important that you to understand why the research is being conducted and what it entails. Kindly take time to read the following information. You are welcome to seek clarification should you need more information.

What is the importance of this study?

This study is based on the following premises:

Ophthalmologists and OCO/ Cataract Surgeons (NPCS) are the two main cadres of eye health workers in Kenya, serving a population of almost 48 million people.

In the recent past, there have been talks about task-shifting of eye health services. It is not clear what knowledge, attitude and practices both groups have, regarding task shifting. The information obtained will be instrumental in better understanding of this phenomenon.

Who qualifies to participate?

As an esteemed eye health worker, we invite you to participate in this research because we believe you have invaluable information on this topic, given your experience; hence your selection to participate in the study.

Participation is out of your own volition

You are hereby invited to participate out of your own free will. Your right to participate or not remains unalienable. Your withdrawal from this study at any point in time is permissible.

What is involved in this research project?

Once you have understood what the study entails, and you are willing to freely participate, we request your consent to fill the study questionnaire. A pre-tested survey questionnaire (Appendix III), with closed-ended questions will be sent to you electronically. The questions may take about 15 minutes of your time to answer. We'll be glad if you could complete filling the questionnaire as your opinion is important to us.

Are there any risks involved when you participate in this study?

No risks are involved in this study. You do not have to answer any questions or participate in the survey should you feel uncomfortable to do so.

Are there any benefits of participating in the study?

No direct benefits will accrue to you. However, your participation will be instrumental in helping us understand task shifting of eye health services better.

How will we protect your information and confidentiality?

Information obtained during the study will be kept confidential. It will only be accessed by the research team. Under no circumstances will any names be revealed.

How will the results obtained from this study be used?

The results obtained from this study will be shared with you the participants, Ophthalmological Society of Kenya, Ophthalmic Clinical Officers Association as well as Ophthalmic Services Unit. The results will be published for knowledge purposes and for learning by other interested parties.

I'm I allowed to refuse to participate or to withdraw from this study?

One does not have to participate in this study if one doesn't wish to do so. Should you wish to discontinue your participation in the study after beginning, you may stop at any time by informing the principal investigator.

In case I need more information, who may I contact?

Should you have any questions, you may contact:

1. **Dr. Ernest Ollando (Principal Investigator)**
   Department of Ophthalmology, Moi Teaching & Referral Hospital, Eldoret.
   Email: eollando@yahoo.com
   Cell: 0726929971.
2. **Dr. Pratap Kumar (Study Supervisor)**
   Strathmore University Business School, Institute of Healthcare Management.
   Email: pkumar@strathmore.edu
   Cell: 0731848163

Part II: Certificate of Consent: (for signatures if you choose to participate)

My name is Ernest Ollando, an MBA Healthcare Management student at Strathmore University Business School, Nairobi. I am conducting a survey to establish the knowledge, attitude and practices of Ophthalmologists and Non-Physician Cataract Surgeons regarding Task shifting of eye care services in Kenya.

The information gathered from this study will add to the body of knowledge on task shifting and task sharing. Data collected during this study will be kept confidential and will be used for purposes of the study only. No harm will arise from participating in the study. You are free to withdraw from the study at any point in time, by informing the researcher, should you feel uncomfortable. Even though no direct benefits shall accrue to respondents for participating in the study, we encourage you to participate as we believe your experience and opinion is important. Kindly take a few minutes to answer the questions. This may take about 10-15 minutes of your time. Please sign below to indicate your consent to voluntarily participate in the research.

Thank you for your participation.

Respondent:	**Researcher:** Ernest Ollando
Sign:	**Sign:**
Date:	**Date:**

Appendix II: Research instruments/ Questionnaire:

Questionnaire for Ophthalmologists and Non-Physician Cataract Surgeons (OCO/CS).

Instructions: Please tick the appropriate response.

Section A: Biodata: **Cadre: 1.** Ophthalmologist ☐ **2.** OCO/CS ☐

Name (Optional): **Sex: 1.** Male ☐ **2.** Female ☐

Age in Years:

1. 18-25	2. 26-35	3. 36-45	4. 46-55	5. 56-65	6. >66

Highest Academic Qualifications:

1.PhD	2. M.Med, Msc. or equivalent	3.Fellowship	4.Bsc. or equivalent	5.Higher National Diploma	6.Diploma	7.Others (Specify)

Current workplace/ Institution where you work:

1. University/ Teaching Institution		4. Faith Based Eye Hospital	
2. Eye Unit in a General Hospital		5.Private Eye Clinic/ Hospital	
3. Ophthalmic Services Unit		6. Others (Specify)	

How long in (years) have you worked as an Ophthalmologist?

0-5	6-10	11-15	16-20	21-25	26-30	>31

What other cadres of eye care workers exist where you work?

1. Ophthalmologists		7. Optical technicians	
2. OCO/Cataract Surgeons		8. Clinic technicians	
3. OCO/Low Vision and Refraction		9. Theatre technicians	
4. Optometrists		10. Refractionists	
5. Ophthalmic Nurses		11. Others (Specify)	
6. Community Health Workers		12. None	

Section B: Knowledge Questions:

Instructions: Please tick the appropriate response.

Section B: Knowledge Questions:	**Strongly Agree 5**	**Agree 4**	**Don't Know 3**	**Disagree 2**	**Strongly Disagree 1**
1. Regarding knowledge about Task shifting:					
I have heard about / I know about task shifting of eye care services.					
Task shifting is a process whereby specific tasks are moved, where possible, to health workers with shorter trainings and fewer qualifications.					
	Strongly Agree 5	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**
2. Regarding Tasks that may be shifted in Eye Care Service Delivery:					
Eye care tasks such as small incision cataract surgery may be shifted to OCO/CS.					
Eye care tasks such as visual acuity assessment may be shifted to Ophthalmic nurses.					
Eye care tasks such as refraction and spectacle prescription may be shifted to OCO/CS.					
Eye care tasks such as screening for diabetic retinopathy may be shifted					

to OCO/CS.					
	Strongly Agree 5	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**
3. The following factors need to be considered for task shifting of eye care services to succeed					
Enactment of legislation governing task shifting of healthcare services.					
Training of lower cadres of eye health workers in readiness for additional tasks.					
Training of Ophthalmologists in preparation for their role in task shifting.					
Establishment of standards and regulations for additional roles of the lower cadres.					

Section C: Attitudinal and Practice Questions:					
Attitude Questions: **<u>Instructions</u>: Please tick the appropriate response.**					
	Strongly Agree 5	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**
4. Regarding task shifting at my workplace:					

Task shifting of eye care services is necessary.					
I do shift some eye care tasks to other cadres of eye care workers.					
Task shifting has been useful to my Ophthalmic practice.					

	Strongly Agree 5	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**
5. Regarding eye care tasks that may be shifted:					
Medical tasks such as treatment of allergic conjunctivitis may be shifted to OCO/CS.					
Surgical tasks such as small incision cataract surgery may be shifted to OCO/CS.					
Optical (refractive error correction) tasks may be shifted to OCO/CS.					
Social tasks (patient education & counseling) may be shifted to Ophthalmic nurses.					

Teaching of Eye health workers may be shifted to OCO/CS.					
Management tasks may be shifted to OCO/CS.					
	Strongly Agree 5	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**
6. Regarding tasks I would not shift to other cadres, the following are possible reasons:-					
No felt need for task shifting.					
Perceived incompetence of the other cadres.					
Poor patient management outcomes from other cadres.					
Unsure of the training of the other cadres.					
Risk of litigation arising from task shifting.					
No legal framework to supervise other cadres.					
Practice Questions: **<u>Instructions</u>: Please tick the appropriate response.**					

	Strongly Agree 5	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**
7. Regarding task shifting as currently practiced in Kenya:					
My workplace implements a Policy on task shifting/ task sharing.					
There are Guidelines to facilitate task shifting at my workplace.					
I have received training to facilitate/ supervise task shifting at the workplace.					
I do delegate some tasks to another cadre.					
I do supervise tasks shifted to another cadre.					
I do monitor outcomes of tasks shifted.					
I am satisfied with outcomes of tasks shifted.					
I do take responsibility in case of poor outcomes of tasks shifted.					
I do take remedial measures in case of poor outcomes for tasks shifted.					
I would wish to have leadership training to enable me supervise other cadres.					

	Strongly Agree 5	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**
8. Regarding potential benefits of task shifting; it may lead to:-					
Delivery of eye care services at lower cost.					
Reaching underserved/ remote populations.					
Earlier/ prompt recognition of eye problems.					
Appropriate/ prompt referrals of eye patients.					
Equitable distribution of eye health services.					
Improved quality of service delivery.					

	Strongly Agree 5	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**
9. Regarding possible challenges attributable to task shifting of eye care services as currently practiced in Kenya:					
Quality of service delivery by the cadres to whom tasks are shifted is a major concern.					
Unclear scope of practice is a major concern.					
Compensation/ remuneration of cadres to whom tasks are shifted is a major concern.					
Lack of adequate legislation is a major concern.					
Lack of requisite training of Ophthalmologists in their support supervision role is a major concern.					
Lack of a clear scheme of service is a major concern					

Thank you for your time and participation.

Appendix I11: Key Informant Interview Schedule for Ophthalmologists and Non-Physician Cataract Surgeons.

Part 1: Study Information and Consent form:

My name is Ernest Ollando, an MBA Healthcare Management student at Strathmore University Business School, Nairobi. I am conducting a study to establish the knowledge, attitude and practices of Ophthalmologists and Non-Physician Cataract Surgeons regarding Task shifting of eye care services in Kenya. It is a mixed methods study, with quantitative and qualitative aspects.

You are kindly invited to participate in this key informant interview (qualitative aspect) because we believe your experience and knowledge on this matter adds value to the study. The interview will either be a physical one or a telephone interview depending on your convenience and availability. The interview will be recorded using an appropriate device to facilitate transcription and analysis of the data.

The information gathered from this study, once ready, will be shared with you. It will help improve our knowledge of task shifting, inform policy development and reviews on task shifting of eye care services in the republic as well as improve the task sharing practices. Data gathered from this study will be kept confidential and will be used for purposes of the study only. No harm shall arise from participating in this study.

We hereby invite you to freely participate in the interview. This will take about 20 minutes of your time.

Please sign below to indicate your consent to voluntarily participate in the research.

Thank you for your time and participation.

Respondent:	**Researcher:** Ernest Ollando
Sign:	**Sign:**
Date:	**Date:**

Part II: Interview schedule:

In this study, task shifting refers to a practice in which specific tasks are moved, where possible, to health staff possessing shorter trainings and fewer qualifications.

Questions:

1. Does Task shifting have a role in the provision of eye care services? Please explain.

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2. In Task sharing, does delegation of tasks across cadres improve efficiency in service delivery? How?

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3. In order to improve the chances of success of the task shifting strategy for eye care services in Kenya, what do you think should be done?

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4. In your opinion, what are the Human Resource Development steps that should be put in place to support the task shifting strategy?

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5. How much longer do you think task shifting should be used as a strategy to alleviate eye health work force shortage in Kenya? Explain.

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6. What are the possible challenges attributable to task shifting of eye care services as currently practiced in Kenya? Explain:

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7. In your opinion, what potential benefits can task shifting lead to? Expound:

……

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8. Are there any eye care tasks you think you can shift and why?

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9. What are the reasons that would make you not to shift tasks to other cadres?

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10. What are some factors that need to be considered for task shifting of eye care services to succeed?

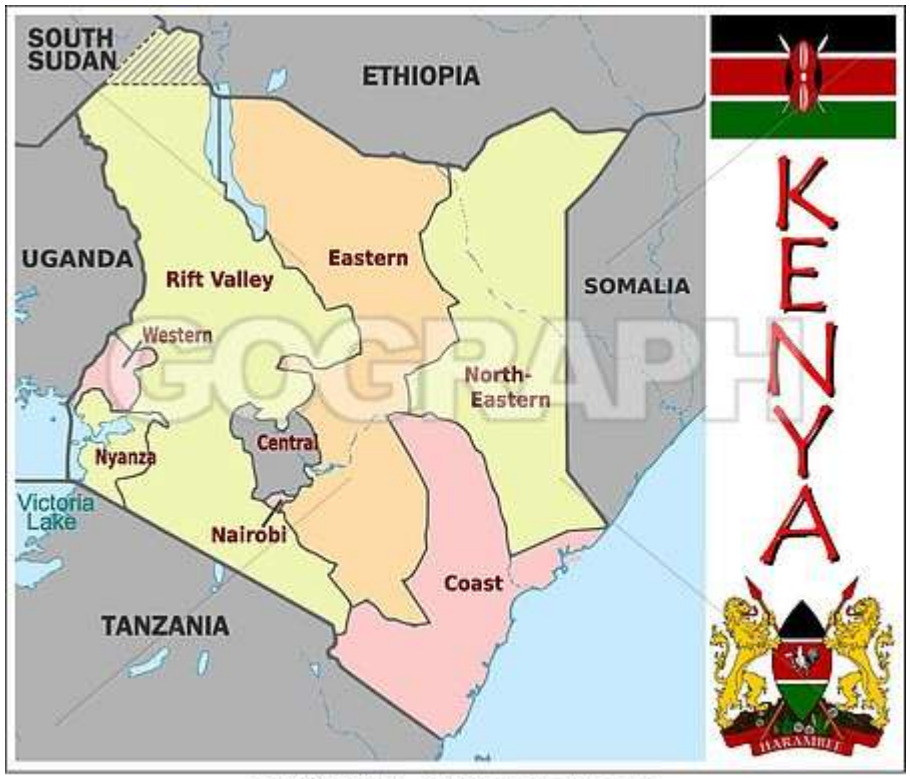
……

……

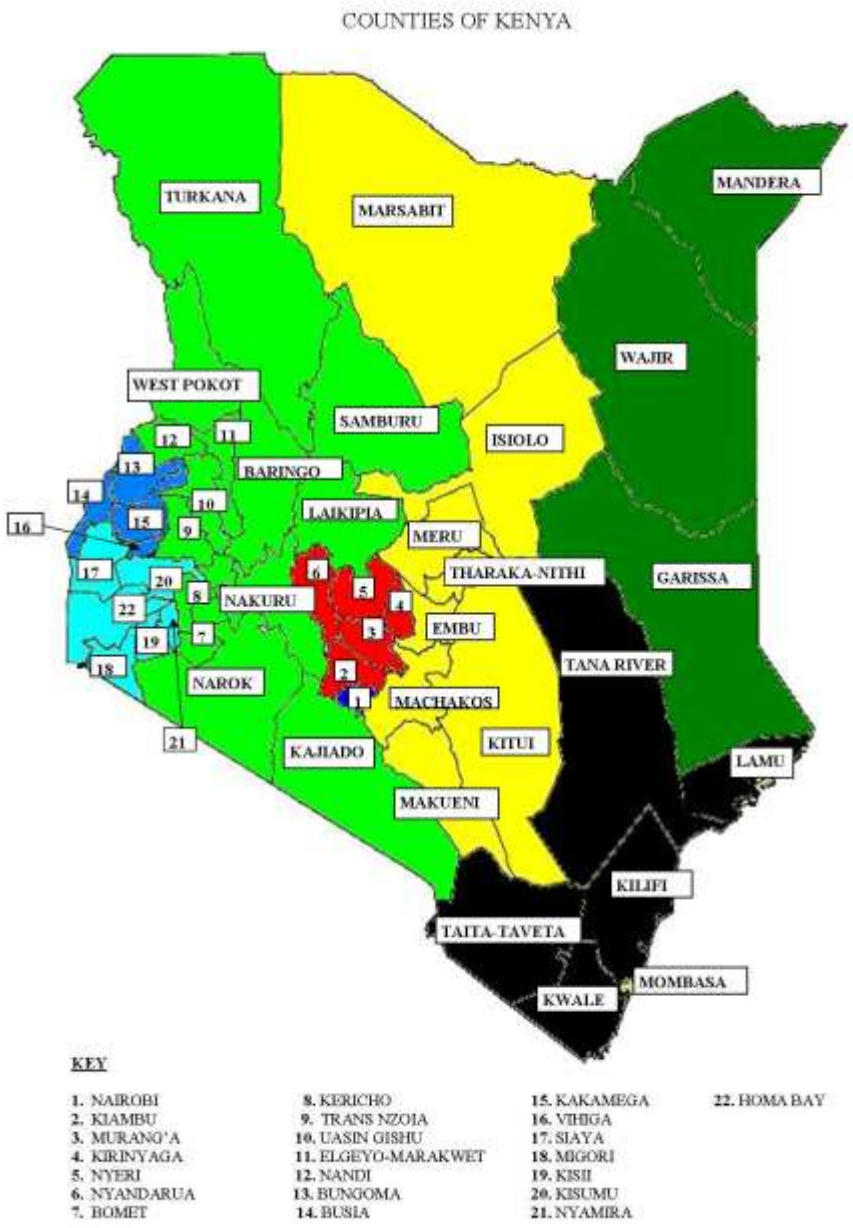
……

Thank you for your time and participation.

Appendix IV: Old and New Administrative Maps of Kenya.



Kenya: Old Administrative Map showing 8 Provinces.



Kenya: New Administrative Map showing 47 Counties and the former 8 Provinces

Source:

http://upload.wikimedia.org/wikipedia/commons/8/86/Kenya counties_map_Labelled.jpg

Table 5.0: Eye Health Human Resource Distribution in Kenya (Human Resource versus Population analysis, the brackets indicate the shortage in human resource).

Province	Ophthalmologists	OCO/CS/Specialist	OCO	ON	OA
Coast **Pop:3,325,307**	7 (6) 1:475,043	10 (23) 1:312,851	3 1:1,108,435	2 (31) 1:1,662,653	1 1:3,325,307
Eastern **Pop:5,668,123**	5 (17) 1:1,133,624	16 (40) 1:354,257	7 1:809,731	8 (49) 1:708,515	4 1:1,417,030
N/Eastern **Pop:2,310,757**	2 (7) 1:1,155,378	3 (20) 1:770,252	0	2 (21) 1:1,155,378	1 1:2,310,757
Central **Pop:4,383,743**	12 (5) 1:365,312	13 (30) 1:337,211	9 1:487,082	12 (32) 1;365,311	2 1:2,191,871
Rift Valley **Pop:10,006,805**	11 (29) 1:909,709	27 (73) 1:370,622	8 1:1,250,850	25 (75) 1:400,272	7 1:1,429,543
Western **Pop:4,334,282**	4 (13) 1:1,083,570	7 (26) 1:619,183	2 1:2,167,141	5 (38) 1:866,856	17 1:254,957
Nyanza **Pop:5,442,711**	5 (17) 1:1,088,542	6 (48) 1:907,118	3 1:1,814,237	3 (51) 1:1,814,237	2 1:2,721,355
Nairobi **Pop:3,138,369**	41 (-28) 1:76,545	10 (20) 1:318,837	11 1:285,306	10 (21) 1:318,837	0
Source: National Strategic Plan for Eye Health and Blindness Prevention 2012 to 2018, page 54.					

Appendix V: Letter of Ethical Approval from the Strathmore University Institutional Ethics Review Committee

Strathmore UNIVERSITY

31st March 2020

Dr Ollando, Ernest
eollando@yahoo.com

Dr Ollando,

RE: Knowledge, Attitude and Practices Regarding Task Shifting of Eye Care Services in Kenya.

This is to inform you that SU-IERC has reviewed and **approved** your above research proposal. Your application approval number is **SU-IERC0710/20.** The approval period is **31st March 2020 to 30th March 2021.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely,

Dr Virginia Gichuru,
Secretary; SU-IERC

STRATHMORE UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE (SU-IERC)
31 MAR 2020
TEL: +254 (0)703 034 000
P. O. Box 59857 - 00200
NAIROBI - KENYA

Cc: Prof Fred Were,
Chairperson; SU-IERC

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email info@strathmore.edu www.strathmore.edu

Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **546316**

Date of Issue: **20/July/2020**

RESEARCH LICENSE

This is to Certify that Dr.. Ernest Agolla Ollando of Strathmore University, has been licensed to conduct research in Baringo, Bomet, Bungoma, Busia, Elgeyo-Marakwet, Embu, Garissa, Homabay, Isiolo, Kajiado, Kakamega, Kericho, Kiambu, Kilifi, Kirinyaga, Kisii, Kisumu, Kitui, Kwale, Laikipia, Lamu, Machakos, Makueni, Mandera, Marsabit, Meru, Migori, Mombasa, Muranga, Nairobi, Nakuru, Nandi, Narok, Nyamira, Nyandarua, Nyeri, Samburu, Siaya, Taita-Taveta, Tanariver, Tharaka-Nithi, Transnzoia, Turkana, Uasin-Gishu, Vihiga, Wajir, Westpokot on the topic: KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING TASK SHIFTING OF EYE CARE SERVICES IN KENYA for the period ending : 20/July/2021.

License No: **NACOSTI/P/20/5803**

546316

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

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