DETERMINANTS OF A FUNCTIONAL REFERRAL SYSTEM IN KISUMU COUNTY, KENYA. PATIENTS' PERSPECTIVE.

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SEPTEMBER, 2019

DECLARATION

"This research thesis is my original work and has not been presented for a degree or any other award in any other University."

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DEDICATION

I dedicate this study to my family and the Kenya Methodist University whose unequaled and material support has been great and relentless towards achieving this goal.

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The tremendous efforts made by my supervisors Ms. Eunice Muthoni and Mr Musa Oluoch in guiding me through this write-up and their contributions are highly appreciated.

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The author solely remains responsible for any errors of omission and/or commission committed while writing the paper.

ABSTRACT

Most referral health facilities are faced with challenges ranging from congestion of patients at these health facilities, limited resources both human and material to deal with the voluminous clients, slow rate of service delivery due to high numbers as a result of the by-passing tendencies. Self-referrals normally results in compromised quality of medical care provided to the patients. The problems mentioned above affects most of the high level health facilities which are traditionally meant to be referral health facilities. The study conducted in the month of August 2017 therefore aimed to find out the determinants of a functional referral system in two level 5 health facilities; Jaramogi Oginga Odinga Referral Hospital (JOOTRH) and Kisumu County Referral Hospital (KCH). The objectives of the study were to; examine the extent to which the primary health care centres characteristics, patients' characteristics, receiving health facility characteristics and proximity to a health facility influence a functional referral system. A cross sectional study was conducted using a qualitative approach to data collection. Three hundred and thirty eight patients were systemically selected to participate in the study. Data was collected using an individual questionnaire through one on one interview between the dates 14th- 22nd August 2017. The collected data were coded and analyzed using the SPSS 25.0 Computer program. The qualitative data collected were analyzed quantitatively using the descriptive statistics and linear regression models. The results indicates that there was a positive and significant influence of the primary health facility characteristics (r=.474**, $p<0.001$) and receiving facility characteristics (r=.475**, $p<0.001$) on a functional referral system at the two high level facilities. There was also a negative but significant influence of proximity to health facility (r=- 0.137**, $p=0.017$) on a functional referral system at the two level 5 facilities. On patients characteristics, a significant interaction was found on gender $\chi 2$ (1) = 4.64, $p= 0.031$, education level $\chi 2(2) = 20.37$, $p<0.001$ and Marital status $\chi 2(2) = 8.78$, $p= 0.012$ with a functional referral system. Conclusion – Factors influencing functional referral system are primary health centre characteristics, patients' characteristics, proximity to a health facility and referral health facility characteristics. It is therefore recommended that the County government of Kisumu should improve the supply of drugs and quality of service delivery at the primary health facilities to attract more patients seeking primary care services, specialists movement especially to the lower level health facilities need to be reinforced by the Ministry of Health to boost the citizen's confidence in quality of care at these facilities, more sensitization strategies need to be put in place to educate both the patients and health care providers on the recommended referral practices that should be upheld to improve efficiency and effectiveness of service delivery.

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ABBREVIATIONS AND ACRONYMS

AMREF	African Medical Research Foundation
GOK	Government of Kenya
HCWs	Health Care Workers
IBM	Integrated Managed Infrastructure
JOOTRH	Jaramogi Oginga Odinga Teaching and Referral Hospital
KCH	Kisumu County Hospital
KNBS	Kenya National Bureau of Statistics
KNHSSP	Kenya National Health Sector Strategic Plan
KNH	Kenyatta National Hospital
MOH	Ministry of Health
PHC	Primary Health Care Centre
RA	Research Assistant
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

1 .1 Background of the study

The World Health Organization lists six key pillars of the health systems namely; Health service delivery, Health Workforce, Health Information system, Access to essential medicine, Health system financing and Leadership and governance, (World Health Organization [WHO], 2007). This study's focus is on health service delivery as a vital pillar affecting most of the developing Nations. Health service delivery as a key pillar in any health systems across the world should be strengthened at all levels to ensure the population access quality health services. Kenya National Health Sector Strategic Plan (NHSSP 2013-2017). The delivery of health care in a hierarchical health system lies in the existence of a well-functioning referral system that allows for continuity of care across different tiers of care. A functional referral system has been considered as an important requisite of a health system since the emergence of primary health care, with the declaration of the Alma Ata declaration in 1978, (Abodunrin, Akande, & Osagbemi, 2010).

Globally, the response of the health sector and societies to the challenges facing primary health care has been slow and inadequate. It reflects both an inability to mobilize the requisite resources and institutions to transform health around the values of primary health care. There is also a failure to either counter or substantially modify forces that pull the health sector in other directions, namely: an unbalanced focus on specialist hospital care; disintegration of health systems; and the spread of unregulated commercial care, (WHO, 2013).

A study carried out in Nigeria in one of the referral hospitals indicates that a high proportion of patients who were seen at the tertiary health facility were not referred, 92.9% had reported to the

facility without referral, (Abodunrin et al, 2010). Some of the challenges in the health referral systems in most developing countries include noncompliance with referral guidelines, high numbers of self-referrals to higher-level health facilities, delays in referral completion, weak Health information Systems (HIS) to capture referral data and inadequately resourced referral facilities, (Abodunrin et al., 2010).

According to the Kenya Health Sector Referral Implementation Guidelines 2014, referral health care system in Kenya like in most developing countries is accessed across a pyramid – like structure of health institutions. It is organized around six level of care that fit into four tiers of care based on the scope and complexity of the services offered. The Referral guidelines take into account the six levels of care in Kenya. These levels are: 1. Community Health Services (Level 1): this level lies at the foundation of the health delivery system, and comprises of community health services. 2. Primary care Services (level 2 and level 3): These levels of care include facilities such as dispensaries, health centers, maternity and nursing homes. 3. county Referral Services (level 4 and level 5): these facilities are managed by any given county and include hospitals that offer a broad spectrum of treatment, and whose services complement the work of primary care facilities. 4. National Referral Services (level 6): These facilities offer specialized health care services including national referral hospitals, laboratories, blood banks and research facilities, (Government of Kenya/ Ministry of Health [GOK/MOH], 2014).

Typically the apex of this structure consists of a national hospital / referral research institutions, while at its base comprises small scale health facilities – the health centers and dispensaries. In between the pyramid lie tiers 2-5. This system allows for movements of patients or their

problems from the base of the national health care system to its apex and vise-versa, (Richard, Paul, Michael & Terry, 2004).

These movements of patients were actually designed to be initiated by the health professionals at the lower tiers, but in actual practice, patients do this by themselves and/or are assisted by their relatives. ``Health systems have a responsibility not only to improve people's health but also to protect them against the financial cost of illness and to treat them with dignity,'' (WHO, 2013).

Health planners designed the system that minimizes cost of treating illness with a model `vertical' approach. That is, illness is referred from the community dispensaries and health centers which are rather cheap and the patient is then referred to the next tier if the illness cannot be treated at that first primary level. It implies that, the low level health units should be accessed before the patients progressively move up to a more expensive unit. Jaramogi Oginga Odinga Teaching and Referral Hospital have been in existence for more than 100 years. Since then it has grown to become the referral hospital serving more than 100 district and sub-district hospitals in more than ten Counties in the Western Kenya Region. Its main mandate is to provide curative, preventive, promotive and rehabilitative health services, (Stephanie, 2011).

Jaramogi Oginga Odinga Teaching and Referral Hospital has had challenges of time strained health personnel seeing many patients whose cases could be handled impeccably at a lower level health facility. Even though these facilities have wings that deals with outpatient clients, this erratic flow of such patients to this facility can still be controlled to improve quality of care within the facility. The study therefore aimed to find out the functionalities determinants of an

effective referral system and come up with recommendations that will help in solving this perennial challenge within the health system. A functional referral system is the dependent variable of the study. The independent variables are; primary health facility characteristics, patient characteristics, receiving facility characteristics and proximity to a health facility.

1.2 Statement of the Problem

Most referral health facilities (level five) are faced with challenges ranging from congestion of patients at these health facilities, strained/ limited resources (both human and material) to deal with the voluminous patients, slow rate of service delivery to the patients due to high numbers, unclear guidelines that gives direction on referral execution and compromised quality of services to the patients, (Abodunrin et al., 2010). There is also the aspect of low knowledge levels of the health care workers on the available guidelines and of course their attitude towards its implementation. State of the infrastructure at the primary health care centers and their functionalities are also some of the factors that influence the patients' behavior towards seeking medical care, (Hsia, Mbembati, Macfarlane & Kruk, 2012).

A study carried out by the Office of the Auditor General-GOK in the year 2012 revealed that only 3.6% of the clients seen at Kenyatta National hospital had direct referrals letters from the primary health care providers - dispensaries and health care centres, (Government of Kenya [GOK], 2012). In 2013, Measure Evaluation in collaboration with the Kenya Government conducted a survey across eight Counties which showed that only 32.7% of the patients attended to have some form of referral. This study was conducted between June and July 2013 in eight counties: Garissa, Kakamega, Kilifi, Kirinyaga, Machakos, Nairobi, Nakuru, and Siaya and a

total of 88 facilities and 27 community units (CUs) were assessed. Majority of the clients just walked in with cases that can even be managed at the primary level of care, (GOK , 2012).

The functionality of the JOOTRH and Kisumu County Referral Hospitals has often been challenged by self-referrals of patients who should be accessing care at lower tier health facilities. Having done the background check, self-referrals within these two facilities stand at 50.0% and 57.4% of patients attending care at JOOTRH and KCH respectively, which has ultimately resulted in overburdened workforce at the referral facilities, Poor quality care to the patients, long waiting time by the patients, restrained resources at the referral facilities and general congestion of patients at these two facilities, (Kenya National Commission on Human Rights, 2017). This study sought to identify the determinants of a functional referral system and give recommendations based on the results achieved.

1.3 Study Objectives

1.3.1 Broad Objective

To examine the determinants of a functional referral system at the JOOTRH and Kisumu County Referral hospitals.

1.3.2 Specific Objectives

i. To establish the influence of primary health facility characteristics on a functional referral system at the JOOTRH and Kisumu County Referral hospitals.
ii. To determine the influence of patients' characteristics on a functional referral system at the JOOTRH and Kisumu County Referral hospitals.
iii. To establish the influence of receiving health facility characteristics on a functional referral system at the JOOTRH and Kisumu County Referral hospitals.

iv. To determine the influence of patients' proximity to a health facility on a functional referral system at the JOOTRH and Kisumu County Referral hospitals.

1.4 Research questions

i. To what extent has the primary health facility characteristics influenced a functional referral system at the JOOTRH and Kisumu County Referral hospitals?

ii. To what extent has the patient characteristics influenced a functional referral system at the JOOTRH and Kisumu County Referral hospitals?

iii. Do the receiving facility characteristics have influence on a functional referral system at the JOOTRH and Kisumu County Referral hospitals?

iv. To what extent do patients proximity to a health care facility influence a functional referral system at the JOOTRH and Kisumu County Referral hospitals?

1.5 Justification of the study

A study carried out by the Office of the Auditor General-GOK in the year 2012 revealed in their final report that only 3.6% of the clients seen at Kenyatta National hospital had referrals letters from the primary health care providers, (GOK, 2012). Measure Evaluation in collaboration with the Kenya Government in July 2013 also conducted a survey in eight counties: Garissa, Kakamega, Kilifi, Kirinyaga, Machakos, Nairobi, Nakuru, and Siaya where a total of 88 facilities and 27 community units (CUs) were assessed and found out that only 32.7% of the patients attended to in these facilities had some form of referral from the dispensaries and health centres, (Jim, Svetlam, & Ilona, 2013).

For JOOTRH and Kisumu County Referral Hospital, there is no published research article that investigated the loopholes of the referral system within the Counties. A lot of funds have been pumped towards addressing the a better service delivery within the Counties including the recent pilot of Universal Health Coverage in the five pioneer counties but without tackling the issues ailing the referral system, achieving success will still be a dream. This study therefore seeks to identify the determinants of such referral loopholes and make recommendations to the Counties to enable them review their referral policies with an aim of making the process more efficient and productive.

1.6 Limitation and Delimitation of the study

1.6.1 Limitation of the study

The study only looked at the four objectives described above within the two referral facilities; JOOTRH and Kisumu County Referral Hospital, with focus on the patients received at the outpatient wing of the two facilities. Generalization of the study finding to other County referral hospital can be a challenge due to varying population dynamics and context.

1.6.2 Delimitation of the study

Achieving the sample size to administer the questionnaire was quite easy since the two facilities were always busy. The two facilities are all level five facilities that are public (government owned). Report by the Kenya National of statistics 2012 noted that Kisumu County admits a total of 210,001 new attendance out patients. On average a total of 575 new patients are admitted at the outpatient wing per day. These two big facilities accounts for 10% of these admissions, thus translating to about 57 outpatient enrolments per day, on the minimum, (Kenya National Bureau

of Statistics [KNBS], 2012). The study focused solely on clients movement among other three elements of a referral framework.

1.7 Significance of the study

In order to achieve the best results in health care service delivery, an effective referral system needs to be in place. The effective implementation of the referral system policy will ensure a close relationship at all levels of the health system and also help the government to ensure that people receive the best possible care closest to their homes. The study findings will be used by the government policy makers to streamline the implementation of the referral guidelines by addressing the identified gaps so as to give the desired outcome. The findings will also shed more light on the determinants of a functional referral system at County level to ensure quality improvement by continually sensitizing the health care workers on the existing guidelines, improving infrastructure at the lower level health facilities and creating awareness amongst the patients on services offered at each level of care.

1.8 Assumptions of the study

This study as a whole has some assumptions regarding referral systems.

These include; Treatment at a higher level of referral system was costly, Quality of services at lower levels of health facilities were acceptable to patients, Patients were well informed of the services provided at different levels of health care delivery and health professionals had power to minimize the by-pass.

1.9 Operational Definition of Terms

Emergency referrals	This refers to Referrals for emergency conditions that threaten life, eyesight or limb.
Determinants of a functional referral system	These are the factors that have influence on a functional referral system. According to this study, the factors that are being investigated to be having influence on a referral system are primary health facility characteristics, patient characteristics, Receiving facility characteristics and proximity to a facility.
Functional referral system	Ensures; Patients use the existing referral ladder and are issued with a referral note in order to access medical care that they need and Health care workers have adequate knowledge on referral system and advises the patients appropriately.
Initiating facility	This is also known as the referring facility, an organization, service, or community unit that prepares an initial outward referral to communicate the client's condition and status.
Pre-test	Testing a questionnaire before study to identify gaps that can be addressed before the main process.

Primary Health Care facility	These are the first point of contact with patients whenever they seek medical attention on their illnesses. i.e. dispensaries, health care centres and community health units.
Referral guidelines	These are the laid down procedures that direct on how a clinician can approach referral process when attending to a patient that requires it. E.g. On what occasion is a referral letter issued to a patient and how it should be tracked, how a health worker on the receiving facility should handle the referred client, Etc.
Receiving Health facilities	This refers to the health facilities where patients from primary health facilities are referred to for advanced care. Also known as Referral Health Facilities E.g. the National referral health facilities. For this study we are looking at JOOTRH and Kisumu County Referral Hospital.
Sampling Technique	Refers to the name or other identification of the specific process by which the entities of the sample have been selected.
Target Population	This refers to the persons who are targeted to respond to the research questions. For this study, it is the patients seeking care.
Validity	Findings truly reflects phenomenon being measured

CHAPTER TWO : LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature related to the problem of the study. It presents the referral tendencies in our health care system. The primary health centre characteristics that influence patients' referral behavior, patients' aspects and the receiving facility characteristics that influence the referral system. A referral can be defined as a process in which a health worker at one level of the health system, having insufficient resources (drugs, equipment, and skills) to manage a clinical condition seeks the assistance of a better or differently resourced facility at the same or higher level to assist in, or take over the management of the client's case, (WHO , 2010).

A review of literature by Murray and Pearson (2006) on maternity referrals in developing countries identified some elements of functional maternity referral system. These include; a referral strategy that is informed by the population needs and local context, health systems capabilities, referral centers that are adequately resourced according to agreed –upon service standards, systems that have active collaboration between referral levels and across sectors and a unified referral record system, (Murray & Pearson, 2006).

Globally, health sector is facing a myriad of challenges on their referral systems due to disjointed implementation of the referral frameworks. The mostly affected countries are the developing Countries where both the health care providers and the patients themselves do not follow the basic guidelines set aside to guide the referral process. A World Health Organization 2013 report indicates that globally there is also a failure to either counter or substantially modify forces that pull the health sector in other directions. These include; un coordinated management of the

referral process; an unbalanced focus on specialist hospital care; disintegration of health systems; and the spread of unregulated commercial care (WHO, 2013).

Regionally, A study carried out in Nigeria in one of the referral hospitals indicates that a high proportion of patients who were seen at the tertiary health facility were not referred, 92.9% had reported to the facility without referral, (Abodunrin et al, 2010). Some of the challenges in the health referral systems in most developing countries include noncompliance with referral guidelines, high numbers of self-referrals to higher-level health facilities, delays in referral completion, weak Health information Systems (HIS) to capture referral data and inadequately resourced referral facilities, (Abodunrin et al., 2010).

Locally, in the Kenyan context, the situation is the same. A study carried out by the office of the Auditor General- GOK in the year 2012, revealed that only 3.6% of patients treated at KNH had referral letters from the lower tier health facilities. Majority of the patients had come by themselves to the facility. This means majority of the patients do not follow the recommended referral framework., (Government of Kenya, 2012).

The literature gives us more information on the situation on the ground as far as referral systems are not functional but it fails to give valid reasons contributing to failures of the referral system. This is the gap which this particular study will try to focus on so as to unearth the contributing factors to this problem with special focus on the patient movement.

2.2 Functional Referral system

An effective and functional referral system ensures health services to all people in Kenya in the following ways; cost effective health services are provided to the citizens, proper coordination and standardization of the referral service, promotion of equity and universal health care coverage to all the citizens and enhance health care planning through performance monitoring of the health care process. This in turn will strengthen lower health facilities and capacity of all the health care workers, improve efficiency of health system by ensuring appropriate use of health services, health care services are provided at the lowest possible cost and better linkage between health facilities at all levels, (GOK/MOH, 2014). A functional referral health facility should follow the guidelines discussed below to achieve the desired outcomes.

2.2.1 General layout of the Kenyan Referral System

The National Health body defined Kenya Essential Package for Health (KEPH) and the Health Service Norms and Standards to guide service standard definitions and service norms for various inputs at each level of care. Contrary to the expectation, proper guidance on the linkage of services and continuity of care across the different levels has been inadequate and ineffectively managed. The health sector consequently developed the referral strategy to guide the sector in building an effective referral system that responds to the health needs of the Kenyan population. This will ultimately lead to the realization of the Vision 2030, sustainable development goals and universal health coverage, (GOK/MOH, 2014). The vision 2030 contains the overall government policy on health. The referral strategy reviews the overall strategic framework and policy that governs the roll out and operations of the referral strategy.

The Kenya Health Sector Referral Implementation guidelines 2014, indicates that effective referral networks should provide linkages across the different levels of the health system, from the community to the tertiary level. This will ensure that patients receive the full spectrum of care provided by the health system, regardless of the level at which they physically access health care. It addresses clients movement, expertise movement, specimen movement and client parameter movement as key elements.

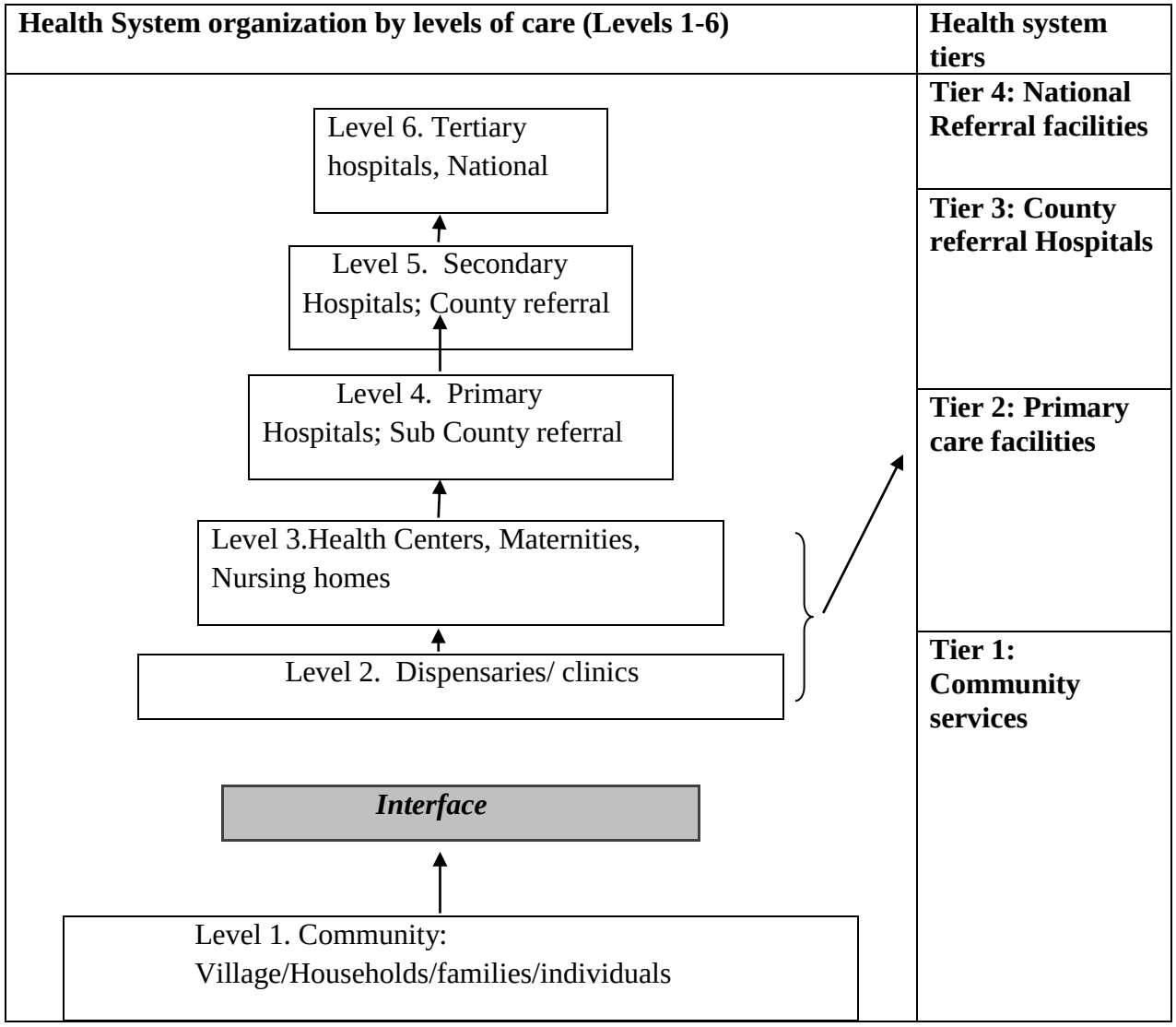

Figure 2.1: Kenya Health systems tiers and levels of care

The guideline further outlines the rights' of every person as far as health access is concerned, roles of the MOH in setting guidelines, roles of the County government and the documentation required for the referral to be complete. The Kenyan health system was organized around six levels of care but was further classified into four tires of care based on the scope and complexity of care (after the devolution). (See figure 2.1 in the previous page).

At Tier 1/level; the system is organized in community units (CU) that consists of about 100 households or 5,000 community members. The units are managed by Community Health Workers (CHWs), volunteers who are supervised by the CHEWS. The CHEWs are employed by the Ministry of Health (MOH). They are mandated to identify illnesses at the household level, treat minor ailments and initiate referral to higher levels of the health system. The community health units act as an interface between the community and the higher level health units.

Tier 2*;* Consists of primary health care facilities that have dispensaries (level II) and health centers (level III) managed by nurses and clinical officers. This tire provides general outpatient services, antenatal monitoring and perform minor surgeries including deliveries. Tier 3*;* the third tier consists of county referral facilities which include former primary and secondary hospitals. These provide both inpatient and outpatient services and are staffed by doctors, clinical officers and nurses. Some act as training centers for clinical officers. Kisumu County Referral Hospital and JOOTRH under study falls under this category. Tier 4*;* the national referral facilities that offer highly specialized care, is used for training purposes and to support research. The government health facilities form the bigger percentage of the existing facilities followed by the Faith based and finally private health facilities.

Kenya's referral services framework provides for movement of clients, expertise movement, Specimen movement and client parameter movement, (GOK/MOH, 2014). The main components of a referral system include; health system service providers, initiating facility and the receiving facility. All these components work hand in hand to ensure that the referral loop is complete and the clients access appropriate care needed.

Among the factors that cause lack of coordination in the implementation of the client include Primary health care centers characteristics, Patient characteristics and the receiving facility characteristics.

2.2.2 Funding of the referral system

Both the national and county governments have ultimate accountability for funding the referral strategy and the delivery of health care outcomes. They are therefore responsible for funding, implementing and operating referral health infrastructure. National government is expected to allocate annual budget to be used to fund the implementation of an effective referral process. The county government is also tasked to mobilize funds that go into strengthening referral networks. The two levels of government are expected to stimulate and encourage other players to develop quality referral systems that are standards compliant, scalable and aligned with the national priorities, (GOK/MOH, 2014).

2.2.3: The Referral Services Framework

Kenya's referral services framework provides for movement of four categories of elements. These include; client movement, expert movement, specimen movement and client parameters movement. This study looks into the challenges facing *client movement* element as shown in Figure 2.2.

Key elements of a referral system

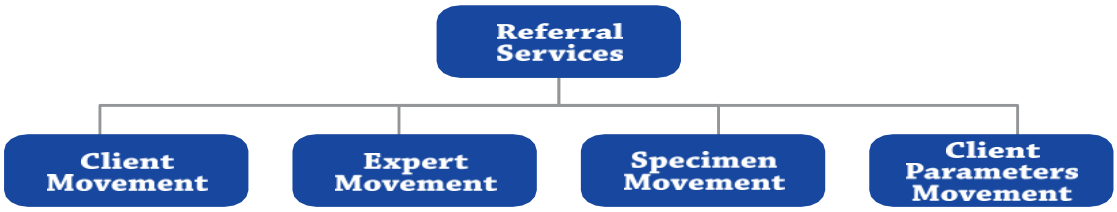

Fig 2.2 Elements of a referral system

Source; Kenya Health sector Referral strategy, 2014–2018

Client movement: This is where a client or next of kin seeks an appropriate level of health care where his/her or next of kin's health needs can be addressed in the most efficient and cost-effective way, while taking into account the different choices of facilities available. **Expertise movement:** This is where specialized service providers come to the client to a facility where the client needs specialized medical attention. Services can be provided in a number of ways, such as directly to clients, medical camp screening, through conducting out-reaches, screening in a medical camp, or surgeries in remote areas. The movement of expert professionals is normally from higher levels to lower levels. Patients are offered services that they lacked at the facilities where they were admitted without moving horizontally or vertically to another health facility.

Specimen movement: This is where laboratory specimens are moved to specialized facilities, usually for diagnostic purposes. This normally avoids the need to move the client in the health services system but only the specimen are moved to a facility where the tests can be done conveniently. **Client parameter movement:** This involves sharing of client information to appropriate levels of the health system for supportive diagnosis or management guidance. The ever evolving and developing e-health trough the scale-up of innovative information and communication technology (ICT) in the health services, will greatly support and facilitate this form of referral, (GOK/MOH, 2014).

2.2.4: Client/patient movement

The form of referral service expected is whereby a client seeks an appropriate level of care at which their health needs are best addressed and this is what most experts equate to a referral system. Normally, client movement referrals from lower levels to higher levels are initiated by Community Health Care Workers from community units or by the clients themselves from households or health facilities. Clients also may be counter-referred by a health care provider from higher-level facilities to primary health care facilities. Client movement or referral can also be done among facilities of the same capacities (horizontal referral) or different capacities - vertical referral, (GOK/MOH, 2014). In a well-functioning referral system, transport for emergency referral are normally done through the use of innovative community methods such as, ground ambulances, water, motorcycles bicycles, or air or depending on the context and the available means of transport. Coordinating all these movements requires use of proper guidelines to ensure successful referrals. Part of the complex process under this process include; initiation of the referral, safe transport, safety in transit, and clinical responsibility. When done

well, both the initiating and receiving facilities work in tandem to ensure client is satisfied with the assistance and medical service offered to them at the end of the process, (GOK/MOH, 2014).

2.2.5 Bypassing of Lower level Health Facilities by Patients.

Some patients have a tendency of bypassing the lower level health facilities and seeking care at the higher level facilities. Some of the possible reasons that may cause clients to bypass lower level facilities include: Lack of clear guidelines for service providers and the general public to guide them, lack of awareness among patients on the where to get health services for different conditions that they are suffering from, low perception on the quality of services offered by the low level health facilities, unavailability of primary health facilities where they reside, system delays where emergency is required on a case, among others, (GOK/MOH, 2014). Some of the primary reasons why health care providers refer clients who seek emergency or routine care are; to be able to seek expert opinion and report on the client's condition or specimen, also to procure additional or different services for the client, to respond to mass incidents and disaster situations, to send specimens for external quality assurance, to seek admission and management of the client, to meet a client's request, to request use of diagnostic and therapeutic tools and address security issues posed by the patient or facility, (GOK/MOH, 2014).

2.3 Primary Health Facility Characteristics

2.3.1 Cost of Accessing Care at the Primary Health Facility

The cost of accessing care at health facility can play a great role in influencing the patients' decision on where they seek care. It is always common to know that most people would choose to a cheaper facility which they can afford. Atkinson and fellow researchers (1999) in a study

looking at the why patients bypass primary health care facility in Lusaka Zambia discovered that cheaper outpatient services guided patients decision to seek care at a particular health facility, (Atkinson, Ngwengwe, Macwan, Harpham & O'Connell, 1999).

But this sometimes turns out not to be the case maybe because of perception that some facilities are more equipped than others. A study conducted in Homa bay by two researchers, Otieno and Macharia (2014) indicates that proximity to a primary health facility influences a patient's decision to access care at the facility. This will ultimately determines the amount of money that they will use to access care at the health facility. As far as distance is concerned, 58% of the patients interviewed recorded that they had to travel more than 5km to access health services, To be precise, a whole 18% of the respondents had to do 10km and over. Additionally, availability of reliable means of transport and the ability of people to afford such means determine their choice of which means of transport to use to reach health facilities, (Otieno & Macharia, 2014).

The study conducted by Kohi et al (2018) further revealed that 33.3% of the patients interviewed had walked to the facility and the other remaining percentage either used bicycle, public transport or private means. Systemic challenges such as high cost of accessing care in a local primary health care centre informs health seeking behavior and choice amongst women interviewed in a study conducted in Tanzania, (Kohi, Mselle, Dol, & Aston, 2018).

2.3.2 Level of Satisfaction of Patients with Primary Health Care Services

Quality of service accessed at the health facility has a great influence on whether the client will ever visit the facility again or have a change in mind on which facility to visit next. This assessed

in terms of the time taken by the client to fully access the care needed, availability of the basic amenities, how the medical staff at the facility interact with the client and whether they are respected and given time to explain their issues. Otieno and David (2014) in a study conducted in Homa bay indicated that majority of the clients were as well satisfied with the reception they got from the clinical staff at the facility and the facility itself which greatly influenced their decision on whether they will continue to access care at the facility. When Patients receive low quality services, their health seeking behavior reduces, (Otieno & Macharia, 2014).

The respect accorded to the patients seeking care at the health facility influences their decision to seek care or not at that particular facility. A study conducted in Malawi Roberts and fellow researchers indicated that the relationship between the patient and the health care worker was identified as one of the influencing factors on mothers attending ante natal care clinics in two referrals hospital. The study further indicated that some health workers demean them hence informs their decision on which facility to visit, (Roberts et al., 2015).

2.3.3 Availability of Services at the Primary Health Facility

Infrastructures are "the basic services or social capital of a country, or part of it, which make economic and social activities possible." In terms of public health, they are the formal and enduring structures that support public health, having both tangible and intangible aspects and existing inside and outside the government sector. They may be directly protective of health - as in public sanitation systems - or they may support other activities that protect and enhance health, (WHO, 2013). Most primary health care facilities lack the vital infrastructure, and the few which have them are facing challenges around how they function. This therefore play a part

in promoting patients' self- referral to the tertiary health institution due to low confidence in the lower cadre facilities. In a study carried out in five countries; Kenya, Ghana, Rwanda, Tanzania and Uganda revealed that the percentage of the hospitals with dependable running water and electricity ranged from 22% to 46%. Only 18% to 41% of the facilities had unexpired drugs and current inventories, this clearly illustrates the lack of infrastructure at the primary health facilities, (Hsia et al., 2012).

A study carried out by Kruk et al (2009) in Tanzania indicated that most maternity patients quoted quality of government dispensaries and health centers as a challenge; hence 42% of the people interviewed had by passed these primary health care centers, (Kruk et al., 2009). Lack of adequate infrastructure has previously been quoted as one of the contributing factors to referral system mis-function. A study conducted by the Institute of Medicine while looking into the factors that contribute to the existence of a drug resistant tuberculosis listed non-functional or lack of infrastructure as one main contributor to this vice, (Theoclis, 2009). Availability of medical equipments and other Infrastructure directly influences availability of service, hence, patient satisfaction. It is also evident that the facilities lack maintenance systems for the existing medical infrastructure e.g laboratory machines leading to lack of the basic services that require medical equipment, (Opon, 2016).

2.3.4 Availability of Drugs at the Primary Health Facility

The availability and affordability of essential medicines is a major challenge in a health care system of a developing country, yet these medicines are vital in saving the lives of poor Children. A study carried out by Ayub, Shaikh and Kumar (1988) in Karachi Pakistan found out

that 61% of the essential medicines list were not present in the stock, and such finding is in consonance with other studies from various developing countries where the low level public health facilities have the lowest availability of essential medicines and the highest stock-out duration, with average of only 34.9%, (Ayub, Shaikh, & Kumar, 1988).

Poor availability and erratic supply of medicines in the government sector might be rooted in several factors, such as: an inadequate management to address the local needs, poor distribution at the level of local health facilities, corruption at the level of distributers and suppliers; and inefficiencies in the supply and distribution chain and insufficient availability of medicines in appropriate dosage forms for children as found in other studies, (Saleh & Ibrahim, 2005).

2.4 Patient Characteristics in Relations to Referral System

2.4.1 Information Level on the Referral System

Most patients generally prefer seeking medical care at the referral hospitals instead of first visiting the primary health care facilities. This as a result tends to strain service delivery at the referral hospital and yet most of these cases can be solved at a lower level facility. This is because of the patients' attitude, regarding the tertiary health care centers as the best, yet they do not see the danger they pose to the genuine patients who require these services at the referral facility, (Abodunrin et al., 2010). A study carried out by the office of the Auditor General- GOK (2012) revealed that only 3.6% of patients treated at KNH had referral letters from the lower tier health facilities, (GOK, 2012). Majority of the patients had come by themselves to the facility as illustrated in the Table 2.1 below. Out of the total patients seen for the four month period – 162,346 (96.4%) had no referral letters. The management at Kenyatta National Hospital had set

the hospital bed capacity at 1,410 but the actual number of beds in use as at June 2010 was 1,876. This shows that the hospital is indeed seeing many patients than it should have at a given time.

Table 2.1; *Percentage of clients seen at KNH with referral letters from other health facilities*

Month	Total Patients	Referral patients	Referral patients a % of total patients
Sep – 09	43,192	1,752	4.07%
Oct – 09	42,083	1,723	4.09%
Nov – 09	40,605	1,362	3.35%
Dec - 09	42,537	1,232	2.90%
Total	168,417	6,069	3.60%

Stephanie Goff in her article states that JOOTRH normally has 60+ patients being taken care of a single Ward by one Head Nurse, two or three nurses and a handful of students on internship. This clearly shows how the workforce is overstretched by the swelling numbers of patients from non- functional referral system. This study cited the failure of the national referral system as the major contributing factor to this problem. In a study carried out in Nigeria, University of Ilorin hospital, only 7.1% of the clients were referred to the health facility by a clinician. The rest 92.9% reported to the hospital directly, (Akande, 2004.)

Kenya is a low income country situated in the sub-Saharan Africa. It has 47 Counties in the new devolved government system and the medical health service delivery is organized in a traditional pyramid structure. The first level care is provided at the dispensaries and medical clinics. The next level is the health centers and sub-district hospitals, followed by the district hospitals and the General hospitals and finally the National hospitals. JOOTRH, Moi teaching Referral hospital and the Kenyatta National hospital are the tertiary level hospitals in Kenya, (Richard et al., 2004). In the recent publication by the GOK Kenya, (2014), the current Kenya National

Health systems provided for four tiers of health care provision. This starts from the lower primary health care and moves up the ladder to the tertiary care institutions, (GOK, 2014).

The tertiary health institutions in Kenya are crowded with people with all sorts of illnesses (both simple and complex), some of which can be easily managed at the primary health centers. This shows that health care service access should follow a well-structured channel to ensure quality service. This will reduce burn out among the health care providers at the higher level of care and even help in cost minimization by the patients.

The implementation of the first National Health Sector Strategic plan 1999-2004(NHSSP) was far from accomplished. The plan had emphasized the need to prioritize primary health care. Part of the reasons being that the allocation of health resources has been skewed in favor of the tertiary and secondary facilities; yet the primary health facilities are the ones which serve as first points of contacts with the patients. So as a result, whenever the citizens get sick, they prefer visiting the tertiary health facilities instead of primary health care centers because of lack of confidence in these low level facilities. (KNHSSP 2008-2014). And most of the patients referred were from the private clinics. That is a true reflection of the situation in most sub Saharan African countries, (Abodunrin et al., 2010).

Barnett et al (2012) in their study on the developed economy; the United States of America, noted that referral trends are consistent across primary health care and specialist physicians. However they too have a challenge in that out the total referrals made, 50% goes to the specialist physicians and this in turns translates to a high cost of health access, (Barnett, Song, & Landon, 2012). Limited resource availability was a major impediment to the appropriate utilization of the

referral pattern. A study conducted in Malawi in local health facilities indicated that a patient-health care worker relationship had a high influence on the choice of facility this particular client will access, (Kinney et al., 2010).

2.4.2 Patients' Level of Education

To some extent, level of knowledge of a patient can play a apart in their decision to seek care at a specific hospital. A study conducted by Pollack et al (2015) in the United States focusing on the extent to which cancer patients self-refer revealed that patients with college degrees/ or high school graduate were significantly more likely to self-refer, (Pollack et al., 2015). There is lack of evidence locally if patients lack of education plays a role in determining a functional referral system but this study will seek to find out if the trends is the same in Africa as compared to the findings that Pollack et al got the study in the United States.

2.4.3 Patients' Occupation

Most studies conducted in Kenya have revealed that the wealth status informs where a patient is likely to seek care. This can be as a result of the availability of resources to facilitate access and admission to these facilities. A study conducted on the factors that influence place of delivery for women in Kenya revealed that residence of the patient, wealth status and level of education strongly predicted where women would deliver, (Kitui, Lewis, & Davey, 2013).

2.5 Receiving Health Facility Characteristics

2.5.1 Quality of Service offered at the Receiving Health Facility

Many patients believe that the receiving health facilities have better infrastructure, trained personnel, drugs, hygiene as compared to the primary health care facilities. Desire for quality service was identified as one of the major reasons why 35.7% of the patients interviewed self-referred themselves in a study conducted in one of the public referral health facilities in Western Nigeria, (Okoli, Obembe, Osungbade, Adeniji, & Adewole, 2017). This is supported by a study conducted Saleh and Ibrahim that stated that by poor distribution at the level of local health facilities and inefficiencies in the supply and distribution chain and insufficient availability of medicines in appropriate dosage forms for children as found in other studies influences patients decision to seek care at higher level facilities, (Saleh & Ibrahim, 2005).

The quality of service offered to the patients also plays a key role in the patients decision to seek care at the higher level health facility. Confidence level in the health providers at the referral health facilities is also an influencing factor when it comes to making a decision on which facility to visit, (Naidu, 2009). Waiting time at the facility played a role in influencing patients decision to seek medical care at the facility. A study conducted in Saudi Arabia that looked at the aspects that informs a patient's decision while choosing a facility to visit revealed that time factor was an influencing factor. The study showed that short waiting time at the facility attracted more clients, (Al-Doghaither, Abdelrhman, Saeed, & Magzoub, 2003).

2.5.2 Availability of Preferred Service Providers

Availability of preferred health provider tend to play a part in patients' decision to seek care. The patients tend to believe that the higher level health facilities have better Health service Providers

as compared to the lower level health facility. A study conducted in China by Jin and other researchers (2017) on the Impact of health workforce availability on health care seeking behavior of patients with diabetes mellitus in China, it was found that with the increased availability of specialized physicians at the health facilities that dealt with Diabetes mellitus, the number of patients seeking care in those health facilities greatly increased, (Jin, Zhu, Yuan, & Meng, 2017).

2.5.3 Receiving Facility Staff Knowledge

The health care workers knowledge of the existing referral guidelines plays a vital role in ensuring this process is a success. All these are achieved by having the right staffing ratios in the hospitals and the will from the staff to implement the guidelines as presented. Most of the primary health care centers are also under-staffed, lack proper medical equipment's and resources, (Sanders, Kravitz, Lewin, & Mckee, 1998). The vital components of a good referral system include; health systems service providers, the initiating facility, receiving facility, referral practicality and supervision using the feedback loop. If the health care provider is well aware of the recommended steps to be followed in a referral chain, then streamlining this area would not be a big task, (WHO, 2007).

The current status on the implementation of the referral process is that the guidelines are not properly followed as desired and that raises a lot of concerns as to whether quality health care delivery is being achieved, (HSSP 2013-2017). Is it that the health care workers are not aware of these guidelines? Or is their reluctance towards its implementation hindering the process? These are some of the questions which the study will seek to address. According to the Measure evaluation study 2013 on the functionalities of the referral system, it indicated that most of the

health facilities had referral guidelines or protocols in their stations of work. 13 out of the 15 health facilities had a copy of these guidelines/ protocols. However, only health care providers in 8 out of 15 health facilities reported to have received trainings on the guidelines, (Jim et al, 2013).

2.5.4 Affordability / Cost of Accessing Health Care at the Receiving Health Facility

The cost of accessing care at a Receiving health facility can also play a great role in influencing the patients' decision to seek care at that particular health facility. Most people would normally choose to visit a cheaper facility which they can afford. Atkinson et al in a study looking at the why patients bypass primary health care facility in the year 1999 discovered that cheaper outpatient services guided patients decision to seek care at a particular health facility, (Atkinson et al., 1999). But this sometimes turns out not to be the case maybe because of perception that some facilities are more equipped than others. A study conducted in Homa bay indicates that proximity to a primary health facility influences a patient's decision to access care at the facility. This will ultimately determine the amount of money that will be used to access care at the health facility. As far as distance is concerned, 58% of the patients interviewed recorded that they had to travel more than 5km to access health services, To be precise, a whole 18% of the respondents had to do 10km and over. Additionally, availability of reliable means of transport and the ability of people to afford such means determine their choice of which means of transport to use to reach health facilities, (Otieno & Macharia, 2014).

2.6 Proximity to the Receiving Health Facility

2.6.1 Geographical Distance to a Health Facility

Proximity to health facility plays a key role in clients' decision to choose a facility of care. The patients look at it in terms of costs that they will incur, comfort and even quality of care they expect to receive at a particular health facility. Proximity to a health facility is concerned with which type of health facility is more available to prospective users. This would include the level of professionalism, expertise and treatment that could be provided from the type of facility, that is a hospital versus a dispensary, or if public facilities are limited and not accessible, so private facilities have filled the gap, as is the case in Vietnam, (Ha et al., 2002; Tuan, Dung, Neu, & Dibley, 2005). A number of factors influence the choice of a health service physical access to health care, including; distance from the health facility, availability of transportation, and the condition of the roads. The distance separating potential patients from the nearest health facility is an important barrier to it's use, particularly in rural areas, (NoorAli, Luby, & Rahbar, 1999). Time taken to travel to a health facility is often discussed in terms of geographic or physical access. This makes comparison with other study results difficult "as most of the available literature has focused on the influence of physical accessibility on the use of health services in general" , (NoorAli et al., 1999).

2.6.2 Convenience of Receiving Care at a Health Facility

Convenience of accessing care is majorly tied up with the ease of reaching the health facility and non- existences of barriers that will stagnate this process. This can also be tied up with the distance that determines access to care and means of transport to that particular health facility. Systemic challenges such as high cost of accessing care in a local primary health care centre

informs health seeking behavior and choice amongst women interviewed in a study conducted in Tanzania, (Kohi et al., 2018).

2.7 Theoretical Framework

This study modeled patients' preference for higher level facilities behavior on the basis of one general theories of behavior: the theory of reasoned action, (Ajzen, & Fishbein, 1977). This study therefore borrowed from a theory of reasoned behavior; a concept proposed by Icek Ajzen to improve on the predictive power of the theory of reasoned action by perceived behavioral control. It states that patients behave the way they do because of reasoned action. This theory informed my choice of objectives which keenly looked into the extent to which the status of the infrastructure in the lower level health facilities influenced the ultimate action by the patient to seek care at a more equipped health facility. It stated that the drive to seek health care at a higher level health facility is driven by the belief that the state of the infrastructure is better hence they stand a better chance of receiving quality medical care. The study does not capture the role of supervising organization under this model. The model which guided the variables understudy is well described in the diagram below.

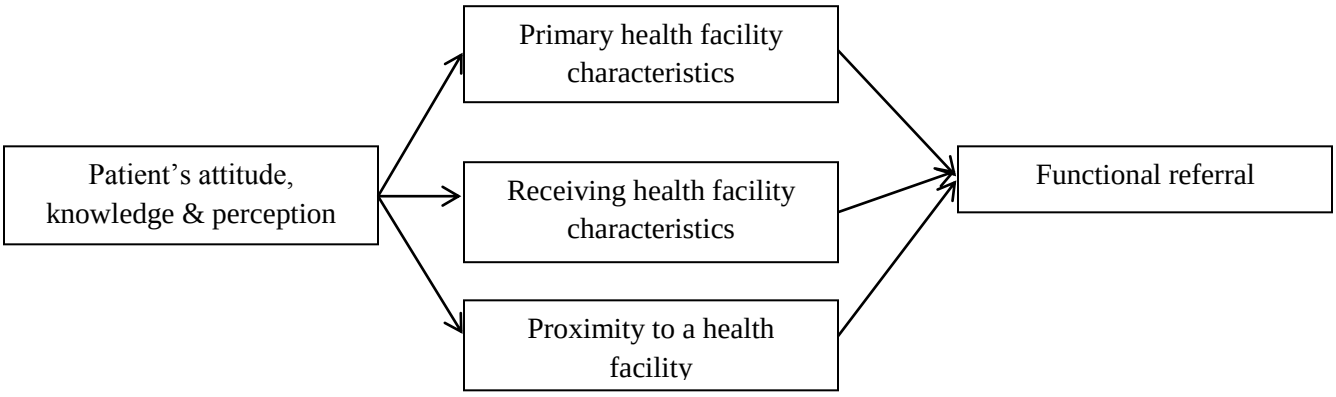

Figure 2.3; Theoretical relationship

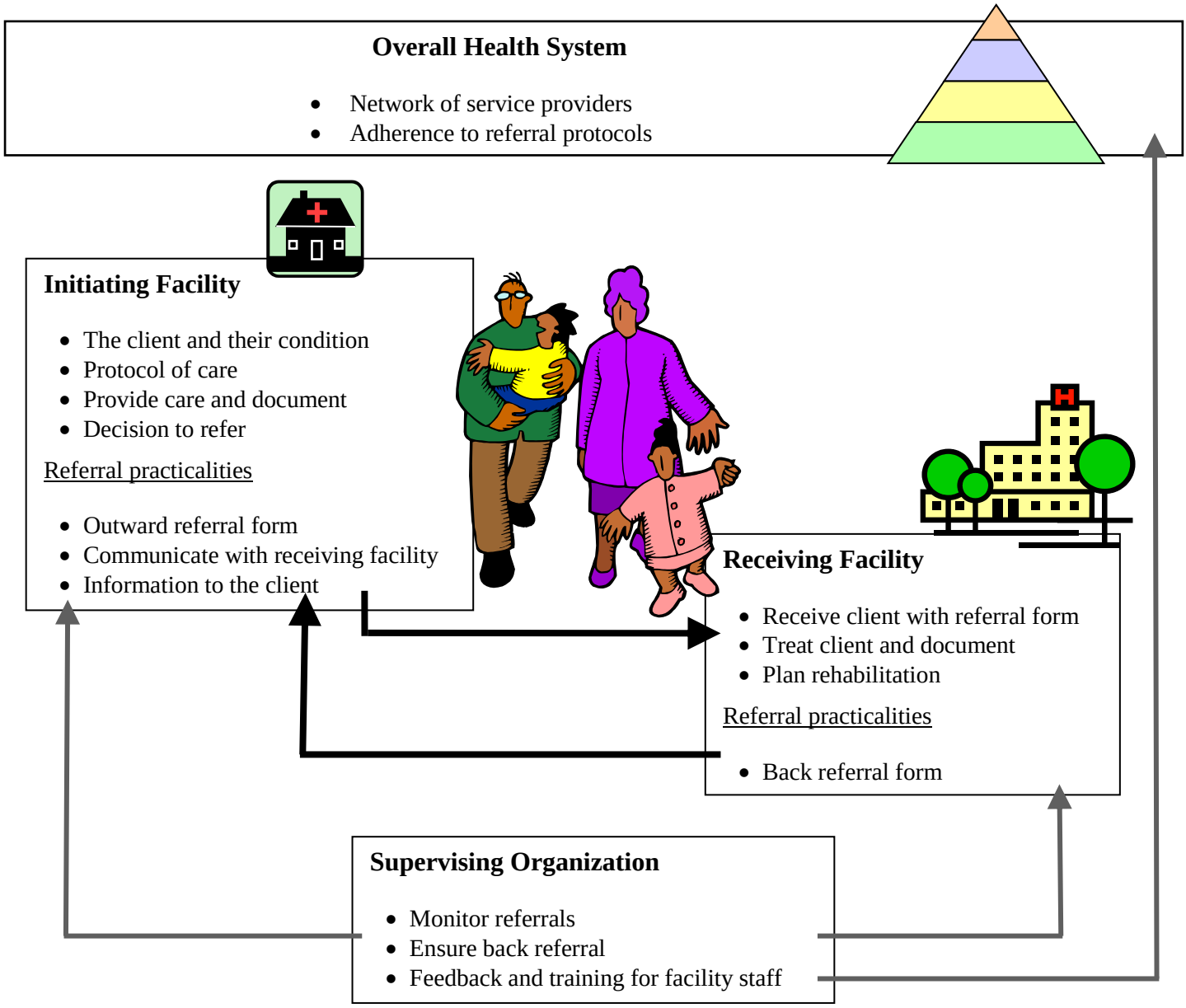

Fig 2.4; WHO Referral model, 2007

2.8 Conceptual framework

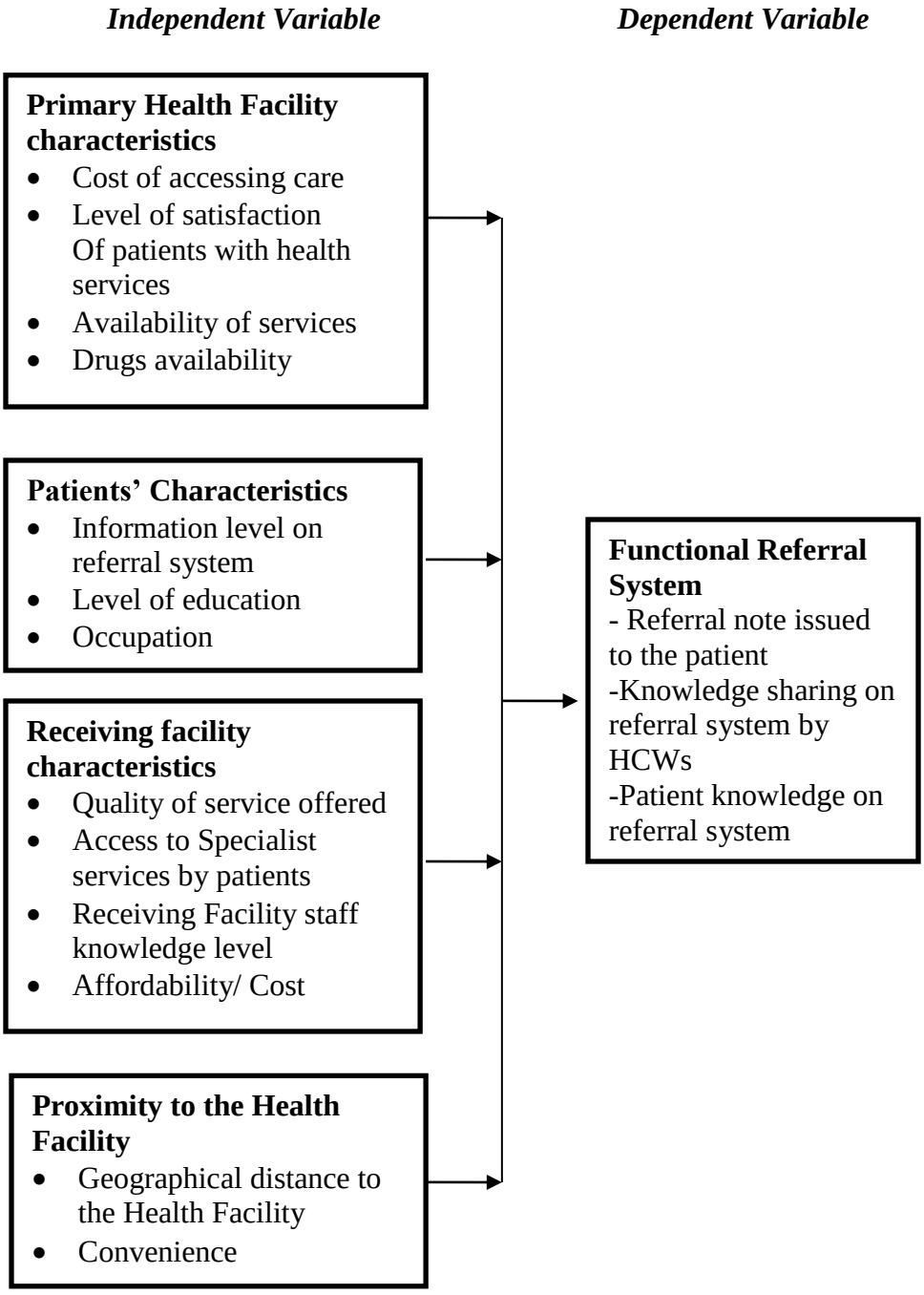

Figure 2.5: Conceptual Framework

2.9 Summary of Literature Reviewed

Finding the much needed information on some of the components of the study was quite a challenge since not much research has been done around this subject. This section defined what referral in health care meant and the elements of a functional referral system. Primary Health facility characteristics have been explained candidly focusing on its access to care by the patients, clients' satisfaction levels with its services and general health care workers attitude towards patients. This section also outlined the common tendencies observed in patients characteristics towards health seeking at both the primary and tertiary health facilities with statistical evidence of these trends. Referral health facilities were also discussed in terms of their accessibility, clients' perception on quality of service that they offer and health care worker knowledge at these facilities.

Finally, the section touched on the influence of proximity to nearby health facility and how it influences patients' decision to seek care at those specific facilities. All these were summarized in a conceptual framework that outlines the connections of the dependent and independent variables towards achieving the desired impact.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives an account on research methodology that will be employed in the study. It describes the research design, location of the study, the target group under study, sample size calculation and the research instruments that was used.

3.2 Research Design

A cross sectional study was used during the study as it engaged new out-patient clients who were accessing medical care at the two County Referral Hospitals of Western part of Kenya (JOOTRH and Kisumu County referral hospital. The descriptive survey method was preferred because it ensures complete description of the situation, making sure that there was minimum bias in the collection of data and finding out the what, where and how of a phenomenon, (Kothari, 2004). The design enabled easy retrieval of useful information from the clients who sought medical care at the two facilities without going back to dig in on their histories which might not be well captured.

3.3 Location of the Study

The study was carried out at the Jaramogi Oginga Odinga Teaching and Referral hospital (JOOTRH) and Kisumu County referral Hospital. JOOTRH is the major referral Hospital in Western region of Kenya, serving a population of approximately 5 million people while KDH, currently known as the County referral hospital is located within Kisumu town serving the same population as JOOTRH. These were selected because of convenience in data collection and knowledge of the area. Report by the Kenya National of statistics 2012 noted that Kisumu

County admits a total of 210,001 new attendance out patients. On average a total of 575 new patients are admitted at the outpatient wing per day. These two big facilities accounts for 10% of these admissions, thus translating to about 57 outpatient enrolments per day, on the minimum, (GOK, 2012).

Kisumu is a city in western Kenya, coordinates 0°6′S 34°45′E at an altitude of 1,131 m (3,711 ft), with a population of 968,909 (2009 census). Kisumu is the third largest city in Kenya, the principal city of western Kenya, the immediate former capital of Nyanza Province and the headquarters of Kisumu County. It was declared a city during its centenary celebrations in 2001, it is the largest city in Nyanza region and second most important city after Kampala in the greater Lake Victoria basin, (Anyumba, 1995).

3.4 Target Population

The target populations for this study were 1,710 patient enrolments per month for the two health facilities health facilities whose ratio of admission stands at 4:5 for KCH and JOOTRH respectively. Out of this population, 338 out-patient clients attending medical care at the outpatient department within the two health facilities (JOOTRH and Kisumu County Referral hospital) were sampled to participate in the Study. The distribution is highlighted in table 3.1 in page 37.

3.5 Sampling Procedure and Techniques

3.5.1 Sample Size Determination

The study sampled a total of 338 patients clients seeking care at the two facilities using a patient questionnaire. This calculation targeted the out patients to be interviewed since the health care workers were conveniently sampled from the two health facilities. According to previously published studies actual percentage of self-referred patients was 11.5%, (GOK, 2012).

In 2013, Measure Evaluation in collaboration with the Kenya Government conducted a survey across eight Counties which showed that only 32.7% of the patients attended to have some form of referral documents. Sample size was calculated with the precision /absolute error of 5% and type 1 error of 5% using the Fischer's formulae, (Rosner, Bernard, 2010).

$$n = \frac{Z_{1-\alpha/2}^{\ 2} p(1-p)}{d^2}$$

Where; n = the desired sample size.

$Z_{1-\alpha/2}$ =the standard normal variate (at 5% type 1 error, P<0.05) =1.96

p =is the expected proportion in a population based on previous studies or pilot studies

d= is the absolute error or precision-decided by researches usually 5%.

$$Samplesize = \frac{(1.96^2 \times 0.115 \times 0.885)}{0.05^2} = 156.39$$

Substitute in the formula using p= (1-32.7%) =63.7%; to obtain n=338;

Table 3.1: *Sample size distribution*

#	Facility name	Population size (N) Monthly	Sample size
1	JOOTRH	957	189
2	KCH	759	149

3.5.2 Sampling Technique

The distribution of the clients to be interviewed per facility was done based on the daily enrolments from these facilities. A systematic sampling approach was used to identify 338 patients out of a possible enrollment of 1710 per month for the two facilities. Report by the Kenya National of statistics conducted 2012 noted that Kisumu County admits a total of 210,001 new attendance out patients. On average a total of 575 new patients are admitted at the outpatient wing per day. These two big facilities accounts for 10% of these admissions, thus translating to about 57 outpatient enrolments per day, on the minimum. This translates to a total of 1,710 patients per month, (GOK, 2012).

3.6 Inclusion Criteria and Exclusion Criteria

3.6.1 Inclusion Criteria

The patient must be an outpatient client visiting the health facility and either male or female were considered. He or she must be over 18 years of, and if not, a guardian responded on behalf on the minors. The patient should have visited a primary health facility at least once before.

3.6.2 Exclusion criteria

All clients that were very sick and those that could only be supported by the accompanying guardian were excluded from the study.

3.7 Data Collection Instruments

A patient questionnaire was used to collect the information from the patient population. Refer to the appendix II. The research used a total of 26 questions on likert scale (five categories), strongly agree (Score=5), Agree (Score=4), Not sure (Score=3), Disagree (Score=2) and strongly

disagree (Score=1). All these questions were positively framed and intended to capture determinants of referral system among the respondents. A score of 3.4 and above translated to agreement in the respective questions being asked.

3.7.1 Pre Testing of Data Collection Instrument

The patient interview questionnaire was pretested in Chulaimbo Sub- County Hospital with a sample size of 30 respondents who have similar characteristics e.g of similar economic status to that of the target population. The demographic characteristics which were found out to be similar include age, level of education, marital status and economic status. The means score for these characteristics were very much similar if not identical. This was to help identify flaws in the questions to be asked, establish problems that might be encountered during administration and amend any logical and procedural hindrances during the study, (Baker, 1994).

3.7.2 Validity of the Instrument

The questions were reviewed by the experts and supervisors to ensure that they were all in line with the study objectives. The content of the research instrument reflected the content of the study concepts. Recommendations and omissions were considered.

3.7.3 Reliability of the Instrument

Reliability is the degree to which an assessment tool produces stable and consistent results, (Mehdi & AbouNaaj, 2013). This was tested effectively before the tools are rolled out into official use. Reliability estimates (Cronbachs coefficient alpha) were computed for the scores from both the subscales and total test at both pre- and post-testing occasions. In Table 3.2 in the

next page all the constructs in this study returned a Cronbach Alpha of 0.705 meaning that the internal consistency in the study items was maintained throughout this study.

Table 3.2 *Reliability Statistics: combined table*

Category	No of items	Cronbach's Alpha
Primary Health Facility	9	0.729
Patient characteristics	7	0.742
Receiving facility characteristics	8	0.731
Proximity to a Health Facility	4	0.673
Functional referral system	5	0.651

3.8 Data Analysis and Presentation

The qualitative data was collected using a five Likert scale and a means score of 3.4 and above meant the statement was agreeable while the scores below 3.4 meant it was disagreeable. The collected data were entered, coded and analyzed using the SPSS 25.0 Computer programme.

The quantitative data was analyzed using the descriptive statistics and linear regression models based on the study objectives and research questions.

The model is expressed as; $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_{2+} \beta_3 X_{3+} \beta_4 X_4, \ldots + e$

Where; Y (dependent variable) = Functional referral system

X_1 = Primary Health Care Centre Characteristics

X_2 = Patient Characteristics

X_3 = Receiving Facility Characteristics

X_4 = proximity to a health facility

The slope of the line is b, and a is the intercept (the value of y when x = 0).

ε = error term, was the basis under which the four specific objectives outlined in Chapter One The findings were then presented using charts and tables.

3.9 Logistical and ethical considerations

Ethical approval of the study was received from the Kenya Methodist University Scientific Ethical Committee (SERC)(on 20/2/2017); Appendix III, National commission for Science, technology and innovation ethical review body (28/6/2017); Appendix IV and the management of the JOORTH & KCH Hospitals, Ethics and Research Committee (10/7/2017); Appendix V. Informed consent was sought from the patient see Appendix I. The participants were given the opportunity to discontinue their participation in the assessment should they wish to do so.

CHAPTER FOUR : RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the research findings and interpretation of the data collected from the respondents. The data was analyzed from the three sample questionnaires using (SPSS) V25. Findings are presented in Figures/graphs and tables.

4.2 Demographic Characteristics

Out of the proposed 338 patients sampled, only 304 (90%) agreed to participate in the study. 34 patients declined. They cited various reasons as to why they couldn't participate.

Table 4.1: *Socio-Demographic Characteristics of the Respondents*

Variable	Category	Frequency (N=304)	Percentage (%)
Gender	Male	120	40
	Female	184	60
Age	Mean; Median; Range	37.10; 35; 18-71	
Education level	Primary and Below	69	23
	Secondary	128	42
	Tertiary	107	35
Marital Status	Single	68	22
	Married	196	65
	Divorced/Separated/widowed	40	13
Occupation	Employed	222	73
	Unemployed	82	27
Name of the facility	JOOTRH	156	51
	KDH	148	49
County of Residence	Kisumu	231	76
	Siaya	36	12
	Others	37	12
Referred	Yes	141	46
	Self-Referred	163	54

Table 4.1 presents the socio-demographic profiles of the respondents. Majority 184(60%) of the respondents were females, males 120(40%). This could probably be the case because women

seek health care services quite more often than men. The mean age was 37.1 years and ranged from 18-71 years. Most 128(42%) of the participants had secondary school level of education, 107(35%) had tertiary education, while about 69(23%) had primary and below level of education. This indicates that the majority of the people interviewed was of middle age and had some sort of education which can confirm that they clearly understood the objectives of the study and the questions asked.

Majority of the respondents were married 196 (64%), 68 (22%) were single while 40 (13%) were either separated/ divorced or widowed. 222(73%) of the respondents were employed and 82 (27%) were unemployed. The married could have contributed to the bigger number of the group interviewed probably because their spouses could assist them with resources to enable them easily access medical care. Most 156 (51%) of the respondents were interviewed at JOOTRH and 148 (49%) from Kisumu County Referral Hospital. Majority of the respondents 231 (76%) were residents of Kisumu county, 11.8% from Siaya, while 12% resided in other counties. This is supported by a study conducted by Noorali et al (1999) which stated that a number of factors influence the choice of a health service physical access to health care, including distance from the health facility, availability of transportation, and the condition of the roads. The distance separating potential patients from the nearest health facility is an important barrier to it's use, particularly in rural areas, (Noorali et al., 1999). Distance to the two facilities could have contributed to this.

4.3 Primary Health Facility Characteristics

The first objective of the study was to establish the influence of the primary health facility characteristics on a functional referral system among the patients who accessed outpatient care at the JOOTRH and Kisumu County Referral Hospital.

The primary health centres characteristics that were used to examine the determinants of a functional referral system include; geographical access to the primary health facility by the patients, Patients level of satisfaction with the primary health facilities and services, availability of drugs and services and health care worker attitudes towards patients at the low level facilities. The breakdowns of analysis are indicated below.

Table 4.2: *Primary Health Facility Characteristics*

Primary Health Facility Characteristics	**Strongly Disagree**	**Disagree**	**Not sure**	**Agree**	**Strongly agree**	**Mean**	**SD**
n=304	n=304	n=304	n=304	n=304	n=304		
1. Fare to PHC affordable	63 (21%)	223 (74 %)	7 (2%)	10 (3%)	1 (0%)	1.89	0.62
2. PHC always open and accessible	4 (1%)	110 (36 %)	78 (25%)	67 (22%)	45 (15%)	3.13	1.10
3. Waiting time is short at the PHC	10 (3%)	46 (15%)	53 (17%)	140 (46%)	55 (18 %)	3.61	1.05
4. Drugs are always available in PHC	92 (30 %)	106 (34 %)	5 (2%)	74 (24%)	27 (9%)	2.47	1.37
5. Lab tests always available at PHC	143 (47%)	97 (31%)	0 (0%)	47 (16%)	17 (6%)	2.01	1.30
6.Primary Health center is very clean	11 (4%)	177 (58%)	59 (20%)	35 (12%)	22 (7%)	2.61	0.99
7. I receive all services at the PHC	59 (19%)	169 (56%)	8 (3%)	67 (22%)	1 (0%)	2.4	2.44
8.Provider gives required info at PHC	3 (1%)	147 (48%)	63 (21%)	88 (29%)	3 (1 %)	2.81	0.90
9.PHC staff always respectful	12 (4 %)	179 (59%)	36 (12%)	41 (14%)	36 (12%)	2.70	1.13

Inability to afford fare to the nearby primary health facilities by the patients was cited as one of the impediments towards access to the primary health facilities, Mean 1.89 (S.D. 0.62). This probably contributed to bypassing tendencies whereby patients would walk into a nearest referral health facility which doesn't cost him/ her lot of money on fares to access. Systemic challenges such as high cost of accessing care in a local primary health care centre informs health seeking behavior and choice amongst women interviewed in a study conducted in Tanzania, (Kohi et al., 2018).

Waiting time at the Primary Health Facilities was indicated to be short by the majority of the patients interviewed. (Mean 3.61, S.D 1.05). This was the only attribute for which the patients were in agreement with of which could have been as a result of very few people seeking health care services at these primary health facilities, hence no congestion experienced. This is in contrast with a similar study conducted with Rodger et al 2007 which stated that shortening patient waiting times makes them more satisfied with the service delivery in that particular facility hence high patient attendance, (Anderson, Camacho, & Balkrishnan, 2007). Majority of the patients interviewed also concurred that the primary health facilities are always open and accessible (Mean 3.13, S.D 1.1).

As indicated in Table 4.2 (page 44), majority of the patients indicated that drugs were fairly not available in the primary health facilities near them, (Mean 2.47, S.D 1.47). Unavailability of the drugs at the primary health facilities could have pushed the patients to seek medical care at the higher level health facilities. This finding is in agreement with a similar study conducted in five countries; Kenya, Ghana, Rwanda, Tanzania and Uganda which revealed that 18%- 41% of the

primary health care centres lacked drugs, running water and electricity, (Hsia et al., 2012). Many interviewed could not also afford access to laboratory tests recommended to them at the primary health facilities by the health care physicians, (Mean 2.01 S.D 1.30). Lack of laboratory tests affected the access to care at the primary health facility by the patients. Many of them opted to seek care at a referral health facility where they believed these tests could get all the tests required. This finding is supported by a study conducted by Opon et al (2016) that indicates that availability of medical equipments and other Infrastructure directly influences availability of service, hence, patient satisfaction. It is also evident that the facilities lack maintenance systems for the existing medical infrastructure e.g laboratory machines leading to lack of the basic services that require medical equipment, (Opon, 2016).

As far as patient satisfaction is concerned, few patients reported that the health facilities where they received medical care was clean (Mean 2.61, SD 0.99) and only a few could access all the services that they required at these facilities, (Mean 2.4, SD 2.44). This finding is similar to a study conducted by Otieno and David (2014) in Homa bay that indicated that majority of the clients were as well satisfied with the reception they got from the clinical staff at the facility and the facility itself which greatly influenced their decision on whether they will continue to access care at the facility. When Patients receive low quality services, their health seeking behavior reduces, (Otieno & Macharia, 2014).

Most health care providers at the Primary health facilities were reported not to be giving information to the patients on the referral guidelines at the point of service, (Mean 2.81, SD 0.90) This is probably because the healthcare providers had not received sensitizations on the referral

policy to guide their work in advising the patients appropriately. This further means that many patients do not get a chance to understand the required steps that needs to be taken as far as referral is concerned. A good proportion of the patients interviewed also cited respect accorded to them by the health care providers as one of the influencing factors on the receiving care at a primary care facility. Half of the patients interviewed indicted that the respect accorded to them by the providers influenced their decision to self-refer. (Mean 2.9, SD 1.4). This means that the respect accorded to a patient by the Health Care provider greatly influenced their decision to seek care at that particular facility next time. A similar study conducted in Malawi indicated that the relationship between the patient and the health care worker was identified as one of the influencing factors on mothers attending ante natal care clinics in two referrals hospital. The study further indicated that some health workers demean them hence informs their decision on which facility to visit, (Roberts et al., 2015).

From the primary health facility characteristics, it can therefore be said that the availability of drugs, laboratory tests and other key services majorly influenced the patients decision on whether they would access the service at that particular health facility or not.

4.4 Patient Characteristics in Relation to Referral System

The second objective of the study was to establish the influence of the patients' characteristics on the functional referral system at the JOOTRH and Kisumu County Referral Hospital.

The patient characteristics that were used to examine the determinants of a functional referral system were gender, education level, Marital status, occupation and County of residence as discussed in details in the other section of this study. Issuance with a referral note was used as a

measure of functional referral system in this particular analysis. The breakdowns of analysis are indicated in Table 4.3 on the next page.

Table 4.3: *Patient characteristics; Socio-Demographic Factors Associated With functional referral system*

Variable	**Category**	**Issued with referral letter**		**χ2**	**p Value**
		Yes	**No**		
	(n=304)	129 (42.4%)	175 (57.6%)		
Gender	Male	60(46.5%)	60(34.3%)	4.64	*p* =0.031
	Female	69(53.5%)	115(65.7%)		
Education Level	Primary and Below	44(34.1%)	25(14.3%)	20.37	*p* <0.001
	Secondary	39(30.2%)	89(50.9%)		
	Tertiary	46(35.7%)	61(34.9%)		
County of residence	Kisumu	73(56.6%)	158(90.3%)	46.64	*p <0*.001
	Siaya	29(22.5%)	7(4.0%)		
	Others	27(20.9%)	10(5.7%)		
Marital Status	Single	21(16.3%)	47(26.9%)	8.78	*p* =0.012
	Married	84(65.1%)	112(64.0%)		
	Divorced/Separated /widowed	24(18.6%)	16(9.1%)		
Occupation	Employed	93(72.1%)	129(73.7%)	0.99	*p* =0.753
	Unemployed	36(27.9%)	46(26.3%)		
Name of the facility	JOOTRH	70(54.3%)	86(49.1%)	0.779	*p*=0.377
	KDH	59(45.7%)	89(50.9%)		

Note: †- Divorced/Separated/widowed

Table 4.3 above presents the association between functional referral system (issued with a referral note) and patients socio-demographic profiles; Those with higher levels of education had better scores on the aspects of a functional referral system as compared to those with low level of education (p<0.000), with primary level and below 44(34%), secondary 39(30%) and tertiary 46(35%). This means that the educated lot had better understanding of what makes a good referral process as compared to the less educated hence majority were issued with a referral letter

by health care providers prior to visiting a higher level facility. This finding is in contrast to the results gotten in a similar study conducted in the United states (2015) which showed that cancer patients with high school or tertiary education were more likely to self- refer as compared to less educated patients, (Pollack et al., 2015). The female patients (54%) were more likely to be issued with a referral note as compared to their male counterparts (47%) , (p=0.031) and Married patients (65%) were more likely have a referral note issued to them by the medical practitioners as compared to the singles (16%), (p = 0.012).

Those who were residing in Kisumu county 73(57%) table 4.3 in the previous page followed by those residing in Siaya County, 29(23%) counties were more likely to be issued with a referral letter as compared to residing in other county 27(21%).(p<0.001). This is supported by a study conducted by Noorali et al which stated that a number of factors influence the choice of a health service physical access to health care, including distance from the health facility, availability of transportation, and the condition of the roads. The distance separating potential patients from the nearest health facility is an important barrier to it's use, particularly in rural areas, (Noorali et al., 1999, p. 191).
No significant differences were found in terms of functional referral system with regard to occupation and facility of choice of the interviewed patients.

4.5 Receiving Health Facility Characteristics

The third objective of the study was to establish the influence of the Receiving Health Facility characteristics on the functional referral system among the patients who accessed outpatient care at the JOOTRH and Kisumu County Referral Hospital. The Referral health characteristics that were used to examine the determinants of functional referral system include; affordability of fares to access the facility, close proximity to the referral health facility, availability of preferred

services providers, confidential level with the service providers, availability of medicine, waiting time to be seen by a physician, infrastructure status and convenience of receiving care as listed in Table 4.4.

Table 4.4: *Receiving Facility Characteristics*

Receiving Facility Characteristics n=304	**Strongly Disagree** n=304	**Disagree** n=304	**Not sure** n=304	**Agree** n=304	**Strongly agree** n=304	**Mean**	**SD**
1.It cost me little fare to come to this referral facility	66 (22%)	83 (27%)	2 (1%)	122 (40 %)	31 (10%)	2.9	0.85
2.Availability of preferred provider guides my decision	0 (0%)	7 (2%)	23 (8%)	204 (67 %)	70 (23%)	4.11	0.62
3. Have confidence in providers working at the referral facility	9 (3.0%)	81 (27%)	48 (16%)	125 (41%)	41 (14%)	3.36	1.1
4.Waiting time at this Referral facility short	64 (21%)	55 (18%)	3 (1%)	150 (49%)	32 (11 %)	1.66	0.58
5.Availability of medicine attracts me to this referral facility	5 (2%)	36 (12 %)	45 (15%)	156 (51%)	62 (20%)	3.77	0.9
6.Infrastructure attracts me to referral facility	89 (29%)	117 (39%)	0 (0 %)	91 (30%)	7 (2%)	2.38	1.25
7.I'm attracted to quality of service in this facility	26 (9%)	72 (24%)	17 (6%)	154 (51%)	35 (12%)	3.33	1.2
8. I got a lab order that brought me to this referral facility	88 (29%)	142 (47%)	3 (1%)	63 (21%)	8 (3%)	2.21	1.15

Availability of the patients preferred provider came up as a very strong influencing factor amongst the clients interviewed. (Mean 4.11, S.D 1.04). That is, the patients might have had the view that there are better services offered by highly trained Health Care providers in referral facilities as compared to the primary health facilities. This is similar to a study conducted in China by Jin et al (2017) that found out that, availability of preferred health provider tend to play a part in patients' decision to seek care. The study revealed that with the increased availability of

specialized physicians at the health facilities that dealt with Diabetes mellitus, the number of patients seeking care in those health facilities greatly increased, (Jin et al., 2017).

Availability of drugs at the high level institution also influenced majority of the clients decision to access medical care at the apex health facilities, (Mean 3.77, S.D. 0.9) as shown in the table above. Clients had the perception that the primary health facilities are not well equipped with drugs and thereby opted to seek medical care at the higher level facilities. This is supported by a study conducted Saleh and Ibrahim that stated that by poor distribution at the level of local health facilities and inefficiencies in the supply and distribution chain and insufficient availability of medicines in appropriate dosage forms for children as found in other studies influences patients decision to seek care at higher level facilities, (Saleh & Ibrahim, 2005).

Confidence level in the health care workers at the referral institutions by the patients was also cited as one of the factors that nearly influenced their decision to seek health care at the two high level referral institutions, (Mean, 3.36, S.D. 1.11). This would be probably because of the better infrastructure and equipments that these providers can easily access at the referral facilities to improve service delivery. Desire for quality service was identified as one of the major reasons why 35.7% of the patients interviewed self-referred themselves to a higher level health facility in a study conducted in one of the public referral health facilities in Western Nigeria, (Okoli et al., 2017).

The patients however disagreed that short waiting time at the referral facilities influenced their choice for the high level facilities. (Mean 1.66, S.D 0.58). Majority was of the view that the

waiting time was long but would still visit the referral health facility ahead of the primary health facility. This was in contrast to a similar study that revealed that time factor was an influencing factor was quoted in a similar study conducted in Saudi Arabia that looked at the aspects that informs a patient's decision while choosing a facility to visit. The study showed that short waiting time at the facility attracted more clients, (Al-Doghaither et al., 2003).

Little cost of fare to the referral health facility also came out as an influencing factor on the patients' choice of health facility. (Mean 2.9, S.D. 0.85). This was probably due to the patients residence next to a referral facility. The state of the infrastructure at the referral health institution was interestingly not stated by majority as an influencing factor. (Mean 2.38, S.D 1.25).

From this independent variable, receiving facility characteristics, it can be deduced that availability of preferred providers, sufficient medicine and confidence in the quality of services offered at the high level health facilities were the key attributes that influenced a functional referral system.

4.6 Proximity to a Health Facility

The fourth objective of the study was to establish the influence of the patients' proximity to a health facility on the functional referral system among the patients who accessed outpatient care at the JOOTRH and Kisumu County Referral Hospital.

The proximity to a health facility characteristics that were used to examine the determinants of functional referral system include; location of the nearest Primary Health Facility, distance to the PHC, Distance to the nearest referral Health facility and convenience of receiving care at the referral health facility as listed in table 4.5 in page 53.

Table 4.5: *Proximity to a Health Facility*

Proximity to a Health Facility, n=304	**Strongly Disagree**	**Disagree**	**Not sure**	**Agree**	**strongly agree**	**Mean**	**SD**
n=304	n=304	n=304	n=304	n=304	n=304		
1.There is a PHC near my home	85 (28%)	188 (62%)	14 (4.6%)	16 (6%)	1 (0%)	1.88	0.74
2. PHC 5km from my home	53 (18 %)	192 (63%)	32 (11%)	26 (9%)	1 (0%)	2.11	0.8
3.This is the closest referral facility to where I stay	5 (2%)	36 (12%)	45 (15%)	156 (51%)	62 (20%)	3.72	0.90
4.Accessing care at the referral center more convenient	4 (1%)	110 (36%)	78 (26%)	67 (22%)	45 (15%)	3.10	1.39

Majority of the patients interviewed reported that close proximity to the referral health facility influenced their decision to visit the high level facilities, Mean (3.72, S.D. 1.20) as shown in Table 4.5 above. That means the main cause of them by passing the primary health facility was probably because the Referral Health facility was situated nearer to them as compared to the receiving health facility. This finding is supported by a similar study conducted by NoorAli et al that mentioned proximity to a health facility as one of the factors that influences the physical access to health care, including distance from the health facility, availability of transportation, and the condition of the roads. The distance separating potential patients from the nearest health facility is an important barrier to it's use, particularly in rural areas, (NoorAli et al., 1999).

Most of people interviewed stated that most primary health facilities were built far away from where they stay, Mean 1.88 (S.D. 0.74). This greatly supports why the patients opted to seek care at the Referral health facility as opposed to a primary health facility. A previous study

conducted in Homa bay County reported that 58% of the patients interviewed had traveled over a distance of 5 kilometres to access care and 18% had covered over 10 kilometres. This had greatly influenced their choice of health facility to visit, (Otieno & Macharia, 2014). Convenience of receiving care at the referral health facility was also stated some of the patients interviewed (Mean 3.10 S.D 1.39) as an influencing factor. That is, some patients sought care at the receiving health facility out of convenience.

4.6 Functional Referral system

Functional referral system as the dependent variable was influenced by the independent variables listed above. A functional referral system was measured based on the patients being issued with a referral note and being advised appropriately by the Health Care Workers (Both at the primary health care facilities and Receiving health Facilities) on the importance of utilizing the existing referral guides.

Table 4.6: *Functional referral system Characteristics*

Functional f. referral characteristics	**Strongly Disagree**	**Disagree**	**Not sure**	**Agree**	**strongly agree**	**Mean**	**SD**
n=304	n=304	n=304	n=304	n=304	n=304		
1. Always have a letter to referral facility?	10 (3%)	78 (26%)	135 (44%)	56 (18%)	25 (8%)	3.03	0.95
2. Provider asked for my referral letter when we met	66 (22%)	83 (27%)	2 (0%)	122 (40%)	31 (10%)	2.01	1.30
3.Patient know that they should first visit PHC	12 (4%)	163 (54%)	98 (32%)	28 (9%)	3 (1%)	2.50	0.76
4.Medical staff advised me to always come with referral letter	12 (4 %)	179 (59%)	36 (12%)	41 (14%)	36 (12%)	2.73	1.34
5.Not paying if I have a referral letter	3 (1%)	7 (2%)	109 (36%)	136 (45%)	49 (16%)	2.27	0.79

A good proportion of the patients interviewed knew that it was always a good practice to be issued with a referral letter to access services at the referral health facility, Mean 3.03 (S.D. 0.95). In as much as this score didn't reach the minimal agreement score of 3.4, it showed that quite a number of patients were still un aware of the procedure that requires them to seek care at the primary health facility before visiting a referral health facility. The Kenya Health sector Strategy outlines lack of awareness among patients on the where to get health services for different conditions that they are suffering from and procedures that should be followed as one of the challenges facing health referral system, (GOK/MOH, 2014).

Patients opinions were also low on whether they should first visit a primary health facility before they come to get services at the referral facility, (Mean 2.5., SD 0.76) table 4.6 above. This is reflection of a similar challenges explained above that surrounds lack of proper knowledge on the referral policies. This is a true reflection of a similar study conducted in Nigeria at University of Ilorin hospital which showed that, only 7.1% of the clients were referred to the health facility by a clinician. The rest 92.9% reported to the hospital directly, (Abodunrin et al., 2010).

As far as health care workers guidance on referral ladder to the patients is concerned, most of the patients indicated that they were not advised by the physician at the referral health facility to always come with a referral letter whenever they accessed care at these high level facilities. (Mean 2.73, S.D. 1.05). This means that health care providers are equally not sharing the benefits of using the right referral procedures with their patients. A good number of patients were not

aware that they were not required to pay extra fee whenever they present a referral letter to the tertiary level physicians. (Mean 2.27, SD 0.79).

4.7 Correlation Analysis between Independent and dependent variables

This analysis aimed at determining whether each of the predictor variables in this study; Primary health care facilities characteristics, Receiving health facility characteristics and proximity to a Health influence the functional Referral System which is a dependent variable. The findings for each variable in the study were given by the correlation coefficient (r) and its corresponding *p*-value. A *p*-value of less than 0.05 (i.e. *-Correlation is significant at $p<0.05$;) shows that the influence of the independent variable on the dependent variable was statistically significant.

Table 4.7: *Correlation between Functional referral systems, Primary Health Facility Characteristics and Receiving Facility Characteristics*

Spearman Correlation

		Functional -S1	PHC_X1	Recieving_X3	Proximity_X4
Functional referral system_S1	Correlation Coefficient	1.000			
	Sig. (2-tailed)				
	N	304			
Primary Health Characteristics _X1	Correlation Coefficient	.474**	1.000		
	Sig. (2-tailed)	0.000			
	N	304	304		
Receiving facility characteristics _X3	Correlation Coefficient	.475**	-0.016	1.000	
	Sig. (2-tailed)	0.000	0.781		
	N	304	304	304	
Proximity to a Health Facility	Correlation Coefficient	-.137*	0.074	0.023	1.000

_X4	Sig. (2-tailed)	0.017	0.200	0.691	
	N	304	304	304	304

Note: **. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed)

The correlational analysis results of this study revealed that there is a positive significant correlation between primary health facility characteristics (r = 0.474**; P<0.001) to the functional referral system as shown in table 4.7 above. This implies that a positive growth in the scores of attributes that influences a functional referral system improves the referral process. The patients scored poorly on the availability of drugs at the primary health facility, this proves the perception that the availability of drugs at these low level facilities will greatly improve the functioning of a referral system since many clients will by-pass these facilities. Ayub et al (1988) in a study carried out in Karachi Pakistan found out that 61% of the essential medicines listed were not present in the stock, and low level public health facilities have the lowest availability of essential medicines and the highest stock-out duration, with average of only 34.9%, (Ayub et al., 1988).

The study further revealed that there is also a positive significant correlation between receiving facility characteristics (r = 0.475**; P<0.001) to the functional referral system as shown in table 4.7 above. This implies that any improvement on the receiving health facility score positively affects a functional referral system. For instance, availability of preferred service providers influenced Diabetes mellitus patients' decision to seek care at a better staffed facility as compared to poorly staffed low level facilities in China, (Jin et al., 2017).

Proximity to a Health Facility (r = -.137*; P=0.017) was also negatively correlated to the functional referral system. That means the higher the score on the agreement of patients living

nearer the Referral health facility, the more negatively it affects the required and right functioning of a referral system. Most patients will by-pass the primary health facilities just because the Receiving health facility are located nearer to them as compared to the primary health facilities.

The patients characteristics relationship with the functional referral system is explained based on the chi-square table 4.3 in page 48. Those with higher levels of education had better scores on the aspects of a functional referral system as compared to those with low level of education. This means that the educated lot had better understanding of what makes a good referral process as compared to the less educated hence majority were issued with a referral letter by health care providers prior to visiting referral facility. This is in contrast with a similar study focusing on the extent to which cancer patients self-refer which revealed that patients with college degrees/ or high school graduate were significantly more likely to self-refer, (Pollack et al., 2015). The female patients (54%) were more likely to be issued with a referral note as compared to their male counterparts (46%), (p=0.031). Married patients (65%) were more likely have a referral note issued to them by the providers as compared to the singles (16%), (p = 0.012). Probably because they had discussed the issue before making a choice on the facility to visit.

Proportion of Self – Referred Patients

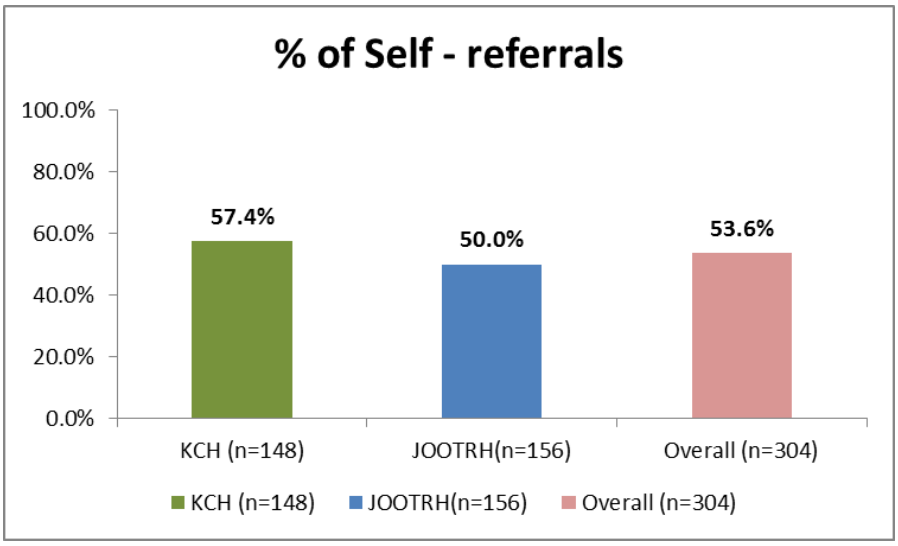

Figure 4.1 Percentage of Self-referrals

A total of 163(54%) of the patients interviewed were self-referred and majority of them sought medical care at the Kisumu County Referral Hospital 85(57%), as shown in figure 4.1 above. This implies that quite a number of patients by passed the primary health facility to seek care at a higher level. Similar study conducted in Muhimbili National Referral Hospital in Dar es salaam showed that 73% of the patients seen were self- referrals, (Simba, Mbembati, Museru, & Lema, 2008). Patients characteristics such as level of information amongst the patients and other demographic characteristics had a greater influence amongst the self-referred patients as compared to the referred patients (Mean 0f 3.20 vs 2.70 for the referred clients).

4.8 Multivariate Analysis of Factors Associated with A Functional Referral Systems

The main model under investigation in this study intended to establish combined influences of four key variables (Primary health care facilities characteristics, Patient characteristics, Referral facilities characteristics and proximity to referral health facilities) on the functional referral system at the Jaramogi Oginga Odinga Referral Hospital and Kisumu County Referral Hospital.

were set. The quantitative data was analyzed linear regression models based on the study objectives and research questions. Normality test was done and the data found to be normal, see appendix vii.

Table 4.8 *Functional referral system: ANOVA*[a]

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	73.891	4	18.473	71.074	.000[b]
	Residual	77.713	299	0.261		
	Total	151.604	303			

a. Dependent Variable: Functional Referral system, S1

b. Predictors: (Constant), Proximity_X_4, Recieving_$_{X3}$, PHC_X_1, Patient_$_{X2}$

A multiple regression analysis was performed on the four key factors (Primary health care facilities characteristics, Patient characteristics, Referral facilities characteristics and proximity to referral health facilities) to test their combined influence on functional referral system. The regression output in Table 4.8, contains all the four variables in this study was found to be valid ($F_{(4,299)} = 71.074$, $P < .005$) meaning the four predictor variables in this study are good or could be acceptable in explaining functional referral system, patient perspective in JOORTH and Kisumu County Referral Hospital.

Table 4.8: *Functional referral system: Model Summary*

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.698[a]	0.487	0.481	0.50981

a. Predictors: (Constant), Proximity_X_4, Recieving_X_3, PHC_X_1, Patient_X_2

The results of regression analysis in Table 4.8 above, indicates that 48.7% of the total variations in functional referral system can be explained by the four factors under investigation in this study (R-squared) = 0.487). The adjusted R-square of 0.481 indicates that if the value of the constant is not significant, the four factors explain 48% of the total variations. The remaining 52% of the variations is explained by factors not included in this study. The standard error of estimate 0.50981 shows the average deviation of the independent variables from the line of best fit.

Table 4.8.1: *Functional referral system: Regression Weights*[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.51	0.288		1.76	0.860
	Primary HC_X1	0.769	0.060	0.535	12.801	0.001
	Patient_X2	0.052	0.040	0.055	1.306	0.193
	Recieving_X3	0.439	0.043	0.425	10.239	0.001
	Proximity_X4	-0.249	0.066	-0.156	-3.755	0.001

a. Dependent Variable: Functional referral system

The study results of the multiple regressions in Table 4.8.1 above, shows that the three factors which influence functional referral system are; Primary health care facilities characteristics, Receiving facilities characteristics and proximity to referral health facilities. In details, the study revealed that Primary health Care facility characteristics (β_1 = .535, p<0.05) and Receiving facility characteristics (β_3 = .425, p<0.05) significantly and positively influences a functional referral system. Proximity to a health facility (β_4 = .-0.156, p<0.05) is significant but negatively influences functional referral system at the JOOTRH and Kisumu County Referral Hospitals.

The constant (β_0) is also positive and but not significant (β_0 = 0.51, P >0.05). The constant (β_0 = 0.51, p>0.05) indicates that functional referral system will always exist at a certain minimum even without the four factors (Primary health care facilities characteristics, patient characteristics, Referral facilities characteristics and proximity to referral health facilities) under investigation in this study.

The Coefficient of Primary health Care facility characteristics (β_1 = .535, p<0.05) shows that a unit increase in primary health care facility perception index leads to an increase in functional referral facility index by .535 which is also statistically significant (p<0.05). From the descriptive analysis, some of the factors that greatly influenced a functional referral system include; availability of drugs at the primary health facility, cleanliness of the health facility, quality of care, and availability of laboratory equipments. An improvement in the areas highlighted above will greatly improve the state of a functional referral system. Hsia et al, 2012 in a similar study carried out in five countries; Kenya, Ghana, Rwanda, Tanzania and Uganda revealed that only 18% to 41% of the low level facilities had unexpired drugs and current inventories, that confirmed the shortage, (Hsia et al., 2012).

The coefficient of Receiving Health facility Characteristics (β_3 = .425, p<0.05) indicates that a unit increase in the receiving health facility characteristics index leads to an increase in functional referral system index by .425 which is statistically significant (p<0.05). Many patients tend to be attracted to the availability of almost all forms of resources at higher facilities as compared to low level facilities. These findings are similar to a study that revealed that many patients believe that the receiving health facilities have better infrastructure, trained personnel, drugs, hygiene as compared to the primary health care facilities. Desire for quality service was identified as one of the major reasons why 36% of the patients interviewed had self-referred themselves in a study conducted in one of the public referral health facilities in Western Nigeria, (Okoli et al., 2017). Another study also revealed that the availability of preferred health provider tend to play a part in patients' decision to seek care. A study conducted in China by Jin and other researchers on the Impact of health workforce availability on health care seeking behavior of patients with diabetes mellitus in China, found that with the increased availability of specialized physicians at the health facilities that dealt with Diabetes mellitus, the number of patients seeking care in those health facilities greatly increased, (Jin et al., 2017).

The coefficient of Proximity to a health facility (β_4 =.-0.156, p<0.05) indicates that proximity to a health facility and functional referral system are inversely related. This means that a unit increase in proximity to a health facility index reduces the functional referral system index by .163 which is statistically significant (p<0.05). This can be interpreted that the tendency of a patient to live near a referral health facility may easily prompt them to bypass a primary health facility and seek care in a higher level facility which is nearby. This is in line with a similar study

conducted in Homa bay by Otieno and David (2012) that indicated that majority of the clients interviewed spent an average of three hours to access all the medical care they had come to receive. That greatly influenced their decision on whether they will continue accessing care at that particular facility or not, due to distance, (Otieno & Macharia, 2012.).

CHAPTER FIVE : SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of the study findings based on the research questions. The conclusions and recommendations drawn will be used to improve the referral system within the Country.

5.2 Summary of findings

The purpose of the study was to determine factors that influence a functional referral system in Jaramogi Oginga Odinga Referral Hospital and Kisumu County Referral Hospital. Specifically, to establish how primary health care facility characteristics, patient characteristics, Receiving facility characteristics and proximity to a health facility influence functional referral system with focus on client movement. Based on the four objectives of the study, the summary of the findings is as below:

Objective 1: Primary health facility characteristics;

The study revealed that primary health facility characteristics influence a functional referral system. Some of these factors that affected a functional referral system include; Unavailability of drugs (Mean 2.47, S.D 1.47), Lack of laboratory tests services (Mean 2.01, S.D 1.3), High fares to a primary health facility (Mean 1.89, S.D 0.62) and inability to receive all the key services (Mean 2.40, S.D 2.44). Bivariate analysis revealed that there is a positive significant correlation between primary health facility characteristics (r = 0.474**; p<0.05) to the functional referral system. Further multivariate analysis revealed that there was also a significant relationship between primary health facility characteristics and the functional referral system. (β_1 = .535, p<0.05).

Objective 2: Patients characteristics

Some of the patient attributes that had influence on a functional referral system include; Education level, gender, marital status and County of residence. Those with higher levels of education had better scores on the aspects of a functional referral system as compared to those with low level of education. The female patients (54%) were more likely to be issued with a referral note as compared to their male counterparts (47%), (p<0.05). Married patients (65%) were more likely have a referral note issued to them by the medical practitioners as compared to the singles (16%), (p<0.05). Those who were residing in Kisumu county 73(57%) followed by those residing in Siaya County29 (23%) counties were more likely to be issued with a referral letter as compared to residing in other county 27(21%), (p<0.05).

Objective 3: Receiving facility characteristics;

The study revealed that receiving health facility characteristics influence a functional referral system. Some of the factors mentioned that affected a functional referral system include; Availability of the preferred health provider was found to be one of the major influencing factors on a functional referral system. (Mean 4.11, S.D 1.4), Better quality care was also found out to be an influencing factor on self-referral tendencies amongst the patients interviewed. (Mean 3.77, SD 0.96) moderately high confidence level in referral health providers by the patients also came out as an influencing factor on a functional referral system. (Mean 3.36, SD 1.11). Bivariate analysis revealed that there is a positive significant correlation between receiving facility characteristics (r = 0.475**; p<0.05) to a functional referral system. Further Multivariate analysis also revealed a significant association between referral health facility characteristics and a functional referral system, (β_3 = .425, p<0.05).

Objective 4: Proximity to a Health facility

Proximity to a health facility influenced a functional referral system but negatively. Some of the factors mentioned that affected a functional referral system include; Distance to a nearby primary health facilities from where the patients stay, (Mean 1.88, S.D. 0.74), close proximity to the referral health facility hence influenced their decision to visit the high level facilities, Mean (3.72, S.D. 1.20) and Convenience of receiving care at the referral health facility was also stated most of the patients interviewed (Mean 3.10 S.D 1.39) as an influencing factor. Bivariate analysis revealed that, Proximity to a Health Facility (r = -.137*; p<0.05) was also negatively correlated to a functional referral system. Majority of the patients interviewed reported that close proximity to the referral health facility influenced their decision to visit the high level facilities, Mean 3.33 (S.D. 1.20). Multivariate analysis revealed there was a negative significant association between referral health facility characteristics and a functional referral system, (β_4 =.-0.156, p<0.05).

General self-referral status

According to the study finding, 54% (95% C.I 48.0-59.2) of the patients interviewed had self-referred themselves into the two referral health facilities and 92% of the referred clients had been issued with a referral letter.

5.3 Conclusion

Objective 1; Primary Health facility Characteristics

From the results, it can be stated that primary health facility characteristics have influence on the functional referral system. These factors include; unavailability of drugs at the primary health facilities, lack of essential services such as laboratory tests at the primary health facilities, low quality of services at the primary health facilities and cleanliness of the facility as a whole. Primary health care centre characteristics therefore significantly influence a functional referral system.

Objective 2; Patient Characteristics

Education level, gender, marital status and County of residence of the patients significantly influenced a functional referral system. Multivariate analysis reveal that only age of the patients also significantly but negatively influences a functional referral system.

Objective 3: Receiving facility characteristics

Receiving health characteristics have influence on the functional referral system. The factors that influence this are; Availability of preferred medical providers, better quality of services offered at the referral health facility which attracts more patients to these facilities as compared to the primary health care centres and high confidence level of patients on the Referral facility Health Providers. Referral health facility characteristics therefore significantly influence a functional referral system.

Objective four; Proximity to a Health Facility

Location of the primary health care facility influences the patients' decision to self-refer themselves hence affecting a functional referral system. When a primary health facility is located far away from the patient, the patient will easily access the Receiving facility without following the due procedure. Convenience of accessing the nearby health facility also came out strongly as an influencing factor.

Theoretical conclusion

The four predictors listed above have influence on a functional referral system and this probably occurs more often in many County governments Referral Facilities sharing a similar context and dynamics. No other research has been done at the County level to test whether the referral system functions effectively as desired and I believe this piece of research will provide data to guide the Counties facing similar challenges to address these gaps adequately and efficiently.

5.4 Recommendations

I. The County government of Kisumu, department of medical services should supply adequate drugs and equipments to attract more patients seeking medical care services to the primary level facilities. Quality of services offered and general cleanliness at the primary health facilities should also be improved to boost patients confidence in them.

II. More sensitization strategies need to be put in place to educate patients on the recommended referral practices that should be upheld to improve efficiency. More specialists need to be deployed to the primary health care centres by the County

department of Standards, quality assurance and regulations to boost the citizen's confidence in quality of care at these facilities.

III. More sensitization sessions should be directed at the Receiving Health Facility workers on the need to educate the patients who have accessed care at these facilities on the benefits of using proper referral procedures.

IV. The County through the Department of Policy Planning and Health Financing should also mobilize more funds to establish some primary health facilities to communities who are living in areas with no primary health facility nearby.

5.5 Further areas of research

Research should conduct further research Specimen movement, expertise movement and client apparatus movement as elements of a referral system and what makes them function well as per the desired National Referral Strategy should.

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Appendix I: Consent form

Wilbert Otieno Nango
P.o Box 49769-00100
Nairobi
Tel: 0710483019
Email: nangowilbert@gmail.com

Kenya Methodist University
P. 0 Box 267-60200
MERU, Kenya

SUBJECT: INFORMED CONSENT

Dear Respondent,

My name is Wilbert Otieno Nango. I am a MSc student from Kenya Methodist University. I am conducting a study titled: **DETERMINANTS OF A FUNCTIONAL REFERRAL SYSTEM IN KISUMU COUNTY, KENYA. PATIENTS' PERSPECTIVE.**

The findings will be utilized to strengthen the health systems in Kenya and other Low-in- come countries in Africa. As a result, countries, communities and individuals will benefit from improved quality of healthcare services. This research proposal is critical to strengthening health systems as it will generate new knowledge in this area that will inform decision makers to make decisions that are research based.

Procedure to be followed

Participation in this study will require that I ask you some questions and also access all the hospital's department to address the six pillars of the health system. I will record the information from you in a questionnaire check list.

You have the right to refuse participation in this study. You will not be penalized nor victimized for not joining the study and your decision will not be used against you nor affect you at your place of employment.

Please remember that participation in the study is voluntary. You may ask questions related to the study at any time. You may refuse to respond to any questions and you may stop an interview at any time. You may also stop being in the study at any time without any consequences to the services you are rendering.

Discomforts and risks.

Some of the questions you will be asked are on intimate subject and may be embarrassing or make you uncomfortable. If this happens; you may refuse to answer if you choose. You may also stop the interview at any time. The interview may take about 40 minutes to complete.

Benefits

If you participate in this study you will help us to strengthen the health systems in Kenya and other Low-in- come countries in Africa. As a result, countries, communities and individuals will benefit from improved quality of healthcare services. This field attachment is critical to strengthening the health systems as it will generate new knowledge in this area that will inform decision makers to make decisions that are research based.

Rewards

There is no reward for anyone who chooses to participate in the study.

Confidentiality

The interviews will be conducted in a private setting within the hospital. Your name will not be recorded on the questionnaire and the questionnaires will be kept in a safe place at the University.

Contact Information

If you have any questions you may contact the following supervisors:

1. Ms Eunice Muthoni - Lecturer Department of Health Systems Management of Kenya Methodist University, Nairobi campus. Telephone number: 0722986349

Email: eunicelucky@yahoo.co.ku

2. Mr. Musa Oluoch - Lecturer Department of Health Systems Management of Kenya Methodist University, Nairobi campus. Telephone number: 0723509359

Email: musaoluoch@yahoo..com

3. Dr. Wanja Head of Department of Health Systems Management of Kenya Methodist University, Nairobi campus. Email: Wanja.tembergen@kemu.ac.ke

Participant's Statement

The above statement regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that I will not be victimized at my place of work whether I decide to leave the study or not and my decision will not affect the way I am treated at my work place.

Name of Participant……. Date……..

Signature…….

Investigator's Statement

I, the undersigned, have explained to the volunteer in a language s/he understands the procedures to be followed in the study and the risks and the benefits involved.

Name of Interviewer…….Date…….

Interviewer Signature……

Appendix II: Patients' Individual Questionnaire

Instructions for Section 1: Kindly tick one option per question and insert response where required
Name of the Facility JOOTRH [ ] KCH [ ] Date: _____
(Jina la kituo)

County of residence: _____Sub- County _____ Form #: _____
(Kaunti) *(Kaunti Ndogo)* *Nambari ya fomu*

SECTION 1: Demographic characteristics ***(tick appropriate choices)***

1. Gender *(Jinsia)* : Male *(Mume)* _____ Female *(Kike)* _____
2. How old are you in years? *(Una miaka ngapi?)* _____
3. What is the highest level of education? *Kiwango cha elimu* No education ☐

   Primary Education ☐ Secondary education ☐ Technical course ☐ Diploma ☐

   Degree /Masters ☐
4. What is your marital status? Single ☐ Married ☐ Divorced/ Separated ☐ No answer ☐

   (Jee umeolewa?)
5. What is your Occupation? Formally employed ☐ Self-employed ☐ Casual employed ☐

   Un employed ☐ Other Specify _____

   (Unafanya kazi gani?) Nimeajiriwa __ Nimejiajiri __ Nafanya kibarua __ Sijaajiriwa __

   Mengine _____
6. Were you referred to this facility by a medical practitioner? Yes ☐ No ☐

   (Ulielekezwa uje upate huduma kwa kituo hiki?) *Ndio* *La*
7. If yes, were you issued with a referral letter? Yes ☐ No ☐

   Kama jibu ni ndio, ulipewa barua ama cheti cha kukuja huku?

SECTION 2

Instructions; ***kindly choose your response among the 5 options where strongly agree = 5, Agree = 4, Not sure = 3, Disagree = 2 and Strongly Disagree = 1 for all the questions under section 2.***

A. Primary Health facility Characteristics						
State the extent to which you agree to the following statements *(Eleza kiwango cha makubaliano na haya sentensi)*						
#	**Statement**	**Strongly Agree** *Nakubali kabisa*	**Agree** *Nakubali*	**Not sure** *Sina hakika*	**Disagree** *Nakataa*	**Strongly Disagree** *Nakataa kabisa*
8	The fare to the primary health facility near my home is affordable *(Nauli kutoka kwangu hadi dispensary unaweza patikana)*					
9	The public health centre is always open whenever I need to access services *(kituo iliokaribu na kwangu huwa umefunguliwa ile wakati nataka kupata huduma)*					
10	The waiting time to see a clinician is always short *(masaa ya kungoja kuona Daktari ni chache)*					
11	Drugs are always available at the primary health centre near me *(Madawa hupatikana kwa urahisi kwenye kituo cha chini)*					
12	Lab tests are always available whenever requested *(uchunguzi wa maabara huwa unapatikana wakati unahitajika)*					
13	The PHC is always very clean *(Kituo cha karibu ni safi)*					
14	I receive all the health services I require at the primary health facility *(Mimi hupata huduma yeyote mimi huhitaji kwenye kituo kilio karibu)*					
15	The health care provider gives all the information that I need regarding referral at the PHCs *(Mfanyi kazi wa huduma za afya hupeana maarifa kuhusu mambo ya rufaa kwa kituo cha chini)*					
16	The staff are always respectful at PHCs (*Wafanyi kazi kwenye hospitali huwa na heshima kwa wagonjwa)*					
B. Patient Characteristics						
Captured in section 1 above						
C. Receiving Health Facility Characteristics						
State the extent to which you agree to the following statements *(Eleza kiwango cha makubaliano na haya sentensi)*						
17	It cost me a little fare to come to this facility as compared to primary health care center *(Inanigahramu pesa nauli kidogo kufika hapa)*					
18	Availability of provider I want guides my decision on					

	which facility to visit *(kupatikana kwa daktari ninayomhitaji inaninfanya nije huku)*					
19	I have confidence in the providers working at this referral facility. *(Nina Imani na wafanyi kazi wa kituo hiki)*					
20	The waiting time in this referral facility is short *(Muda wa kungojea daktari ni chache)*					
21	Availability of medicine attracts me to this referral facility*(kupatikana kwa dawa unanifanya nije huku)*					
22	The infrastructure such as running water, availability of electricity attracts me to this referral facility *(Ubora wa kituo kinanivuta kuja huku kwa matibabu)*					
23	I am attracted to the quality of health service I receive in this referral facility*(Kiwango cha ustadi kwa kazi hunivuta kuja huku)*					
24	I got a laboratory order that brought me here today (*Nilipewa barua ya kujia huduma za maabara huku)*					
D. Proximity to a Health Facility						
25	There is a public health centre near my home *(Kuna kituo cha chini karibu na nyumba yangu)*					
26	The public health centre is within 5km from my home *(Kituo hiki iko kilomita 5 kutoka kwangu)*					
27	This is the closest referral health facility from where I stay*(Kituo hiki ndicho karibu na kwangu)*					
28	Accessing care at the referral center more convenient*(Sina taabu kupata huduma kwa kituo hiki)*					
E. Functional Referral system						
29	I should always have a letter to come to this facility *(Ninafaa kuja na barua ya rufaa kwa hiki kituo)*					
30	The medical provider in this facility asked for my referral letter when we first met *(Daktari wa kituo hiki aliulizia barua ya rufaa)*					
31	I know that I should go to the nearest health centre or dispensary before I come to this one *(Ninajua ya kwamba nifaa nitembelee kituo cha chini kabla nije hapa)*					
32	The medical staff here told me that I should always come with a letter of referral *(Daktari alinieleza niwe nikikuja na barua ya rufaa)*					
33	If I have a letter, I should not pay to access health services in this facility *(Nikiwa na barua, sifai kulipia huduma za matibabu)*					

Thank you

Appendix III: Kenya Methodist University Scientific Ethical Committee (SERC) Approval

KENYA METHODIST UNIVERSITY
P. O. BOX 267 MERU - 60200, KENYA
TEL: 254-064-30301/31229/30367/31171
FAX: 254-64-30162
EMAIL: INFO@KEMU.AC.KE

20TH FEBRUARY, 2017

Wilbert Nango
HSM-3-3496-3/2010

Dear Wilbert,

SUBJECT: ETHICAL CLEARANCE OF A MASTERS' RESEARCH THESIS

Your request for ethical clearance for your Masters' Research Thesis titled "Comparative Assessment of Functionality Determinants of Referral System in High Volume Hospitals in Kisumu County" has been provisionally granted to you in accordance with the content of your project proposal subject to tabling it in the full Board of Scientific and Ethics Review Committee (SERC) for ratification.

As Principal Investigator, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the project.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the SERC for re-review and approval prior to the activation of the changes. The Proposal number assigned to the project should be cited in any correspondence.
3. Adverse events should be reported to the SERC. New information that becomes available which could change the risk: benefit ratio must be submitted promptly for SERC review. The SERC and outside agencies must review the information to determine if the protocol should be modified, discontinued, or continued as originally approved.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by subjects and/or witnesses should be retained on file. The SERC may conduct audits of all study records, and consent documentation may be part of such audits.

5. SERC regulations require review of an approved study not less than once pe 12-month period. **Therefore, a continuing review application must b submitted to the SERC in order to continue the study beyond the approve period.** Failure to submit a continuing review application in a timely fashio will result in termination of the study, at which point new participants ma not be enrolled and currently enrolled participants must be taken off the stud

Please note that any substantial changes on the scope of your research will require a approval.

KENYA METHODIST UNIVERSITY
RESEARCH & DEVELOPMENT
21 FEB 2017
DISPATCHED
P.O. Box 267-60200, MERU

Thank You.

Dr. Wamachi
Chair, SERC
Cc: Dean, RD&PGS

Appendix IV: NACOSTI IRB body Approval

NATIONAL COMMISSION FORSCIENCE, TECHNOLOGY ANDINNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/17/53172/16077**

Date: **28th June, 2017**

Wilbert Otieno Nango
Kenya Methodist University
P.O. Box 267- 60200
MERU.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Comparative assessments of functionality determinants of referral system in high volume hospitals in Kisumu County,"*** I am pleased to inform you that you have been authorized to undertake research in **Kisumu County** for the period ending **28th April, 2018.**

You are advised to report to **the County Commissioner, the County Director of Education and the County Director of Health Services, Kisumu County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

PP **GODFREY P. KALERWA MSc., MBA, MKIM**
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Kisumu County.

The County Director of Education
Kisumu County.

THIS IS TO CERTIFY THAT:
MR. WILBERT OTIENO NANGO
of KENYA METHODIST UNIVERSITY, 36293-200 Nairobi,has been permitted to conduct research in *Kisumu County*

on the topic: *COMPARATIVE ASSESSMENTS OF FUNCTIONALITY DETERMINANTS OF REFERRAL SYSTEM IN HIGH VOLUME HOSPITALS IN KISUMU COUNTY*

for the period ending:
28th April,2018

.....
Applicant's Signature

Permit No : NACOSTI/P/17/53172/16077
Date Of Issue : 28th June,2017
Fee Recieved :Ksh 1000

.....
Director General
National Commission for Science, Technology & Innovation

Appendix V: JOORTH & KDH Hospitals, Ethics and Research Committee Approval

MINISTRY OF HEALTH

Telegrams: "MEDICAL", Kisumu
Telephone: 057-2020801/2020803/2020321
Fax: 057-2024337
E-mail: ercjootrh@gmail.com
When replying please quote

JARAMOGI OGINGA ODINGA TEACHING & REFERRAL HOSPITAL
P.O. BOX 849
KISUMU

Ref: ERC.1B/VOL.I/353

Date 10th July, 2017

Wilbert Otieno Nang'o,
KENYA METHODIST UNIVERSITY.

RE: REQUEST FOR ETHICAL APPROVAL TO UNDERTAKE A STUDY ENTITLED: *"COMPARATIVE ASSESSMENTS OF FUNCTIONALITY DETERMINANTS OF REFERRAL SYSTEM IN HIGH VOLUME HOSPITALS IN KISUMU COUNTY"x*

The JOOTRH ERC reviewed your protocol in a meeting held on 27th April, 2017. Issues were raised by reviewers which you satisfactorily addressed. You are therefore, permitted to commence your study immediately. Note that this approval is granted for a period of one year (10th July, 2017 to 9th July, 2018). If it is necessary to proceed with this research beyond the approved period, you will be required to apply for further extension to the committee.

Also note that you will be required to notify the committee of any protocol amendment(s), serious or unexpected outcomes related to the conduct of the study or termination for any reason.

In case the study site is JOOTRH, kindly report to the Chief Executive Officer before commencement of data collection.

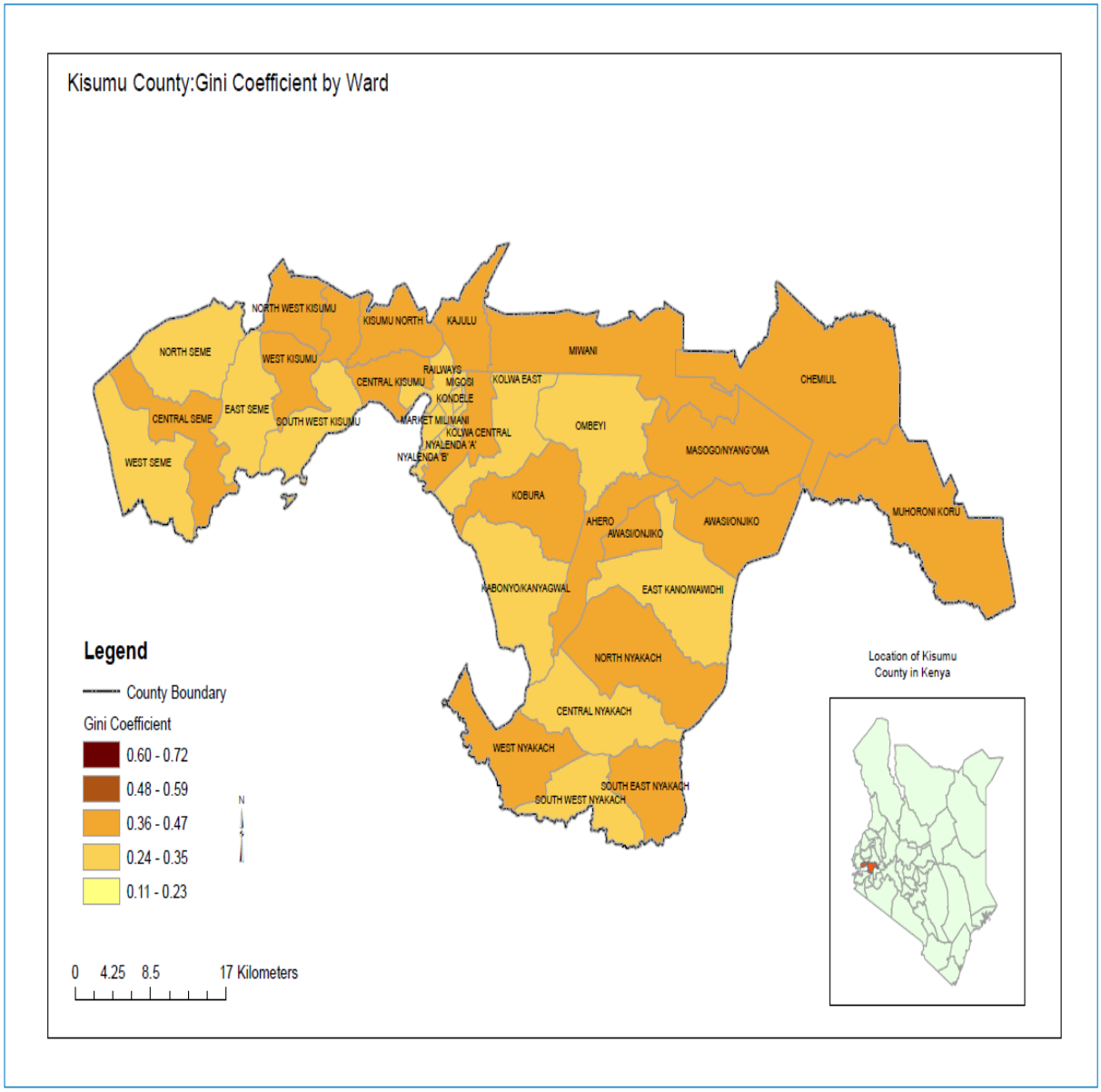
Finally, note that you will also be required to share the findings of the study in both hard and soft copies upon completion.

The JOOTRH ERC takes this opportunity to thank you for choosing the institution and wishes you the best in your endeavours.

Yours sincerely,

WILBRODA N. MAKUNDA
For: **SECRETARY – ERC,**
JOOTRH.

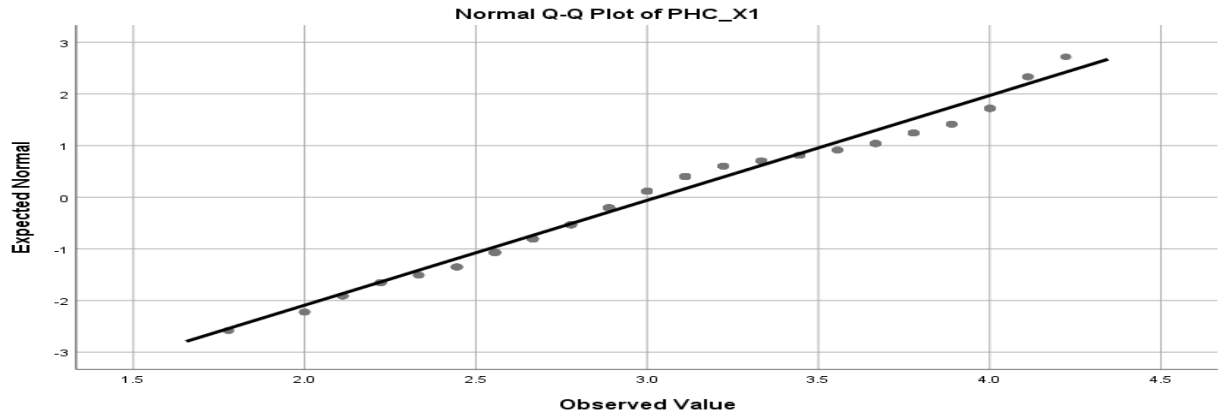
Appendix VI: Map of Kisumu County



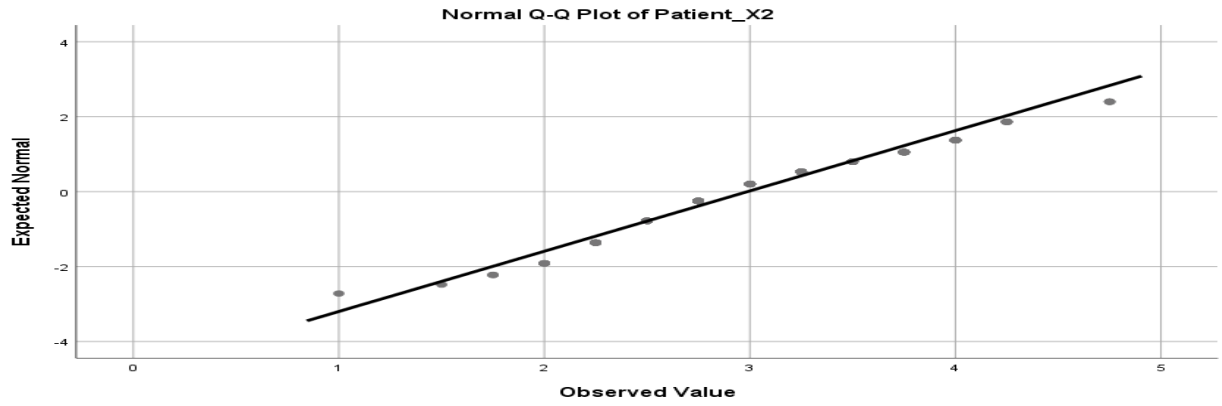
Appendix VII: Test Of Normality

S1

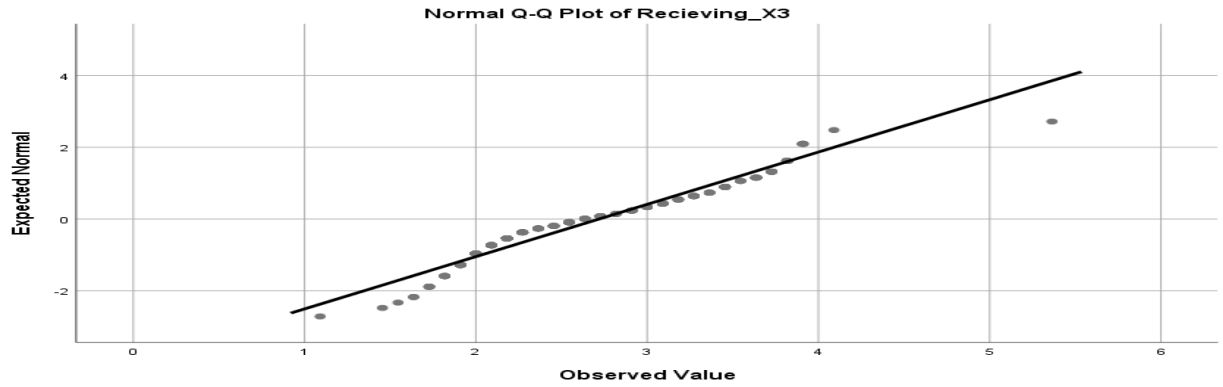
X1



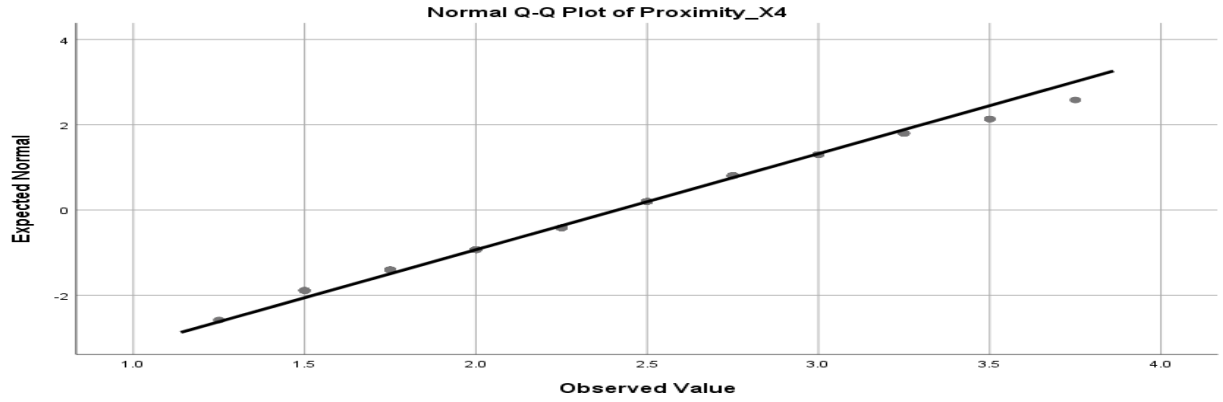
X2



X3


Normal Q-Q Plot of Recieving_X3
Expected Normal
Observed Value
4
2
0
-2
0
1
2
3
4
5
6

X4


Normal Q-Q Plot of Proximity_X4
Expected Normal
Observed Value
4
2
0
-2
1.0
1.5
2.0
2.5
3.0
3.5
4.0