EFFECTS OF HEALTH SYSTEM APPROACH INTERVENTION ON ADHERENCE TO APPOINTMENTS IN ANTENATAL AND POSTNATAL CLINICS IN PUBLIC HOSPITALS IN SELECTED COUNTIES IN KENYA

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DECLARATION

I declare that this thesis is my original work and has not been presented in any other university.

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DEDICATION

This thesis is dedicated to my family and the people of Homabay and Kisumu Counties. It is my hope that this work will benefit the people of Kenya in general.

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My acknowledgement goes to my supervisors, Dr. Kezia Njoroge and Dr. Wanja Mwaura, for their endless efforts and dedication to support this work. I want to sincerely thank the staff members of Homabay County hospital and Kisumu County hospital for their support during the implementation of the intervention. I also acknowledge my family for continuously giving me moral and psychological support towards this work.

ABSTRACT

African medical setting has about 42% missed appointment rate. With about 44% missed appointment rate in antenatal and postnatal clinics, Kenya wastes up to 22% of health resources caused by both facility and patient factors. According to UNICEF 2017 report, 502,860 children were not immunized in 2017, and 1.7 million children born between 2013 and 2017 did not receive all prescribed vaccines. Homabay and Kisumu Counties recorded 42% and 35% missed appointment rates in antenatal and postnatal clinics respectively in 2019 as per 2019 Hospital "*Did Not Attend Reports"*. This study assessed the effect of health system approach intervention on adherence to appointments in antenatal clinics in public hospitals in Kenya. Specifically, the study assessed: the influence of organization of maternal and child health services; contribution of health workers; influence of access; influence of patient characteristics; and effect of system-wide communication on adherence to appointments in antenatal clinics in public hospitals. The study adopted a case control with a quasi-experimental research design in which two hospitals were purposively sampled for inclusion (Homabay and Kisumu County Hospitals) because of the high under-five mortality, poverty rates, and high HIV prevalence rates. These facilities are also ranked on the same level by the Ministry of Health. The study targeted 4 hospital managers and 200 registered antenatal clients in their first trimester of pregnancy. Stratified sampling and proportionate sampling were used to sample clients, and purposive sampling for hospital managers. Yamane Formula was used to determine sample size. The study sample comprised of 133 antenatal clients (Homabay County Hospital 70, Kisumu County Hospital 63) and 2 hospital managers per hospital. A self-administered structured questionnaire and a key informant interview guide were used to collect data. Findings revealed that, in Homabay and Kisumu County hospitals, 55 (78.6%) and 33 (55%) of antenatal clients had missed their appointments because of the long waiting time; 50 (71.4%) and 37 (61.7%) due to poor consultation process; 50 (71.4%) and 27 (45%) due to inadequate responsiveness towards their needs; 50 (71.4%) and 34 (56.7%) due to poor staff attitude; 55 (78.6%) and 30 (50%) due to high opportunity cost of seeking services; and 55 (78.6%) and 25 (41.7%) due to the long distance to the facility. An intervention in form of system wide communication on the above factors in Homabay County reduced missed appointments to 6 (9.1%) due to short waiting time; 10(15%) due to enhanced consultation process; 9 (13.6%) due to better staff responsiveness; and 14 (21.2%) due to improved staff attitude. Single, separated and young antenatal clients miss more appointments than the married, cohabiting, and older clients. The Pearson chi-square test also showed p value of 0.000 revealing a strong association between the variables. The logistic regression models depicted high odds ratio (at 95% confidence interval) of appointment adherence with positive increase in independent variables. Also, the independent variables have a $p<0.05$ depicting high significance to dependent variable. Conclusively, there is a high missed appointment rate in ANC clinics in Homabay and Kisumu County hospitals because of long waiting time and poor consultation process; poor staff attitude and inadequate staff responsiveness; and high opportunity cost and facility location. The study recommends that the two counties reorganizes MCH services by increasing consultation points; train staff on public relations; devolve crucial ANC services to remote areas; adopt this study's system approach intervention; and community health workers to educate mothers on the significance of ANC services to improve adherence to appointments in ANC clinics.

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ABBREVIATIONS

ANC	Antenatal Care
DNA	Did Not Attend
DTP	Diphtheria, tetanus toxoids and pertussis
FGD	Focused Group Discussion
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
KDHS	Kenya Demographic and Health Survey
KII	Key Informant Interview
MCH	Maternal and Child Health
MICS	Multiple Indicator Cluster Survey
MMR	Maternal Mortality Rate
NACOSTI	National Commission for Science, Technology and Innovation
NHS	National Health Service
PNC	Postnatal Care
REC	Reaching every child
SMS	Short Message Service
SPSS	Statistical Package for the Social Sciences
SREC	Scientific Research and Ethical Committee
UNICEF	United Nations Children's Emergency Fund
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Health care is among the most important aspects in the world, and every country endeavors to strengthen their health system. Health systems strengthening requires attention to all the six pillars of the health system; health workforce, health service delivery, health financing, health information, health products and commodities, and leadership and governance (World Health Organization [WHO], 2013). According to World Health Organization (WHO), each pillar contributes significantly to strengthening the health system. The governance function reflects the fact that people entrust both their lives and their resources to the health system. The government exercises its stewardship function by developing, implementing, and enforcing policies that affect the other health system functions. Health workforce interventions address human resources problems such as misdistributions, poor motivation, and poor capacity. Health commodities address issues to do with access to essential medicines and supplies, which is fundamental to the good performance of the health care delivery system. Health management information supports decision making at various levels of the system and informs and guides decision making from central-level policy development to local monitoring of primary health care activities (WHO, 2013).

Addressing healthcare challenges require effective and sustainable interventions. According to the WHO (2018), solving healthcare issues require systems thinking approach. Healthcare is a multifaceted system that involves high risk to clinicians, patients, and other stakeholders. The healthcare system is composed of interrelated and interdependent components that work together as a whole to achieve a common goal. Without incorporation of any component, the results are likely to be fragmented. Therefore, interventions in healthcare should encompass a systems thinking approach

that integrates all components of healthcare. Systems thinking is based on the dynamic synchronization, interaction, and integration of processes, people, and technology (Trbovich, 2014). With an in-depth understanding of the dynamics among processes, people, and technology, systems thinking helps recognize how to successfully intervene in the healthcare system. Also, system thinking aids in the identification of essential connections and relationships often undervalued or missed that are integral to a successful implementation of interventions. If healthcare industry can focus on enhanced system thinking application in interventions, it is likely to reform care delivery system through the reduction of unexplained variations and complexities of practice. Therefore, healthcare industry should incorporate system thinking to ensure holistic approach to problem solving, understand system-wide effects, identify leverage points through proactive approaches, and creating a systems approach culture.

Health systems thinking approach acknowledges that solving healthcare problems is difficult because these problems occur in relation to each other and not in isolation. Many studies have, however, examined such problems in isolation (Trbovich, 2014). Therefore, the lack of systems approach in addressing healthcare challenges lead to fragmented solutions that do not solve the intended problem, and often introduce unintended issues. Application of systems thinking helps identify system components, captures interdependencies, and identifies how tasks can be sequenced, synchronized, and coordinated. In essence, system thinking entails approaching healthcare as a whole instead of parts. While many studies tend to solve healthcare issues, the solutions do not last because of the lack of systems approach to problems. Attempting to solve healthcare issues without a system thinking approach, despite the good intentions, can lead to unintended problems (Trbovich, 2014). Systems thinking aids healthcare facilities learn how components of healthcare organization interact rather

than how they function independently. Therefore, systems approach is essential in implementing sustainable interventions in healthcare.

This study will attempt to strengthen both health service delivery and health financing pillars with respect to antenatal care (ANC) and post natal care (PNC) through health systems approach intervention. According to WHO (2018), health service delivery, which is the pillar of focus in this study, includes broad array of health sector components, including the role of the private sector, government contracting of services, decentralization, quality assurance, and sustainability. This pillar addresses some of the key organizational and managerial components of the health system that can directly or indirectly affect health service delivery. Government policy and regulation affect the organization and management of service delivery. Good health service delivery is one that delivers quality, safe, effective health interventions to those who need them, when and where needed, with minimum waste of resources (WHO, 2013). On the other hand, health financing is a key determinant of health system performance in terms of equity, efficiency, and quality. It encompasses the methods used to mobilize the resources that provide access to basic health services (Guy *et al*., 2012). A good health financing system should be able to raise sufficient finances for health to ensure that everyone can utilize the services they need and are protected from hardship or financial devastation from paying for these services (WHO, 2015). One of the principles of health financing is to improve efficiency of resource use. The World Health Organization recommends 15% of the country's national budget to be allocated to health (WHO, 2013). While many countries are yet to achieve this recommendation, the already inadequate health resources are still wasted or misappropriated due to low uptake of health services. Haji et al. (2016) attributes this wastage in ANC and PNC clinics where most services are free, but are not utilized fully, to missed appointments leading to high under-five mortality rates.

According to United Nations International Children's Emergency Fund [UNICEF] (2017), antenatal care coverage is the proportion of women between the age of 15 and 49 with a live birth at a certain period who received antenatal care from skilled/accredited health personnel (doctor, nurse or midwife) at least once during pregnancy (WHO, 2018). According to Bangure et al. (2015), receiving antenatal care during pregnancy term is not a guarantee of receiving interventions that are effective in improving maternal health. The World Health Organization (WHO) recommends receiving antenatal care at least four times to increase the likelihood of receiving effective maternal health interventions during antenatal visits. Studies show that most mothers tend to attend ANC clinics in their first trimester only, and miss the consecutive appointments (Arora et al., 2015). PNC clinics also face a high rate of missed appointments, as many deliveries are still done outside the hospitals. Sometimes even mothers who have their deliveries within the hospitals miss their consecutive appointments for vaccinations leading to wastage of resources that have already been allocated for that purpose, leading to alarming under-five mortality rates. Globally, the neonatal in proportion of under-five mortality, between 1990 and 2013, increased from 37 to 44 per cent (WHO, 2018). Therefore, reduction of global under-five mortality is largely dependent on a reduction in neonatal deaths. All these risk factors can be minimized or prevented through ANC interventions, and the WHO recommends four or more ANC visits to curb the risks.

In Africa, according to the WHO, at least 1.16 million African babies die in the first 28 days of life annually. In addition, according to WHO (2018) about 870,000 newborns and 125,000 women die annually seven days after childbirth even though the health programmes are free and at their lowest along the continuum of care at this stage. In Africa, 18 million women do not deliver in health

facilities, posing a great challenge for planning and implementing postnatal care (PNC) for women and their new-born (WHO, 2018). According to the WHO (2018), if routine ANC and PNC reached 90 per cent of babies and their mothers, then 10 to 27 per cent of new-born deaths could be averted. According to the 2018 WHO global status report, 19.9 million and 20.8 million children did not receive diphtheria, tetanus toxoids and pertussis (DTP) and measles vaccine, respectively. The report also places Africa's immunization coverage at 70 percent (WHO, 2018). Haji et al. (2016) and Kimeu et al. (2015) attributes the low coverage to missed scheduled appointments.

According to the World Health Organization 2018 report, health care systems waste up to 40% of their funds globally, out of which nearly up to 56% is attributed to missed appointments. The United Nations agency concluded, in their analysis of how countries pay for health and what they get in return, that many countries continue to invest more funds in health care despite the wastage resulting from missed appointments. In addition, Deloitte (2016) found out that the world spends approximately $5.3 trillion on health care annually, and about $300 billion is wasted. In 2015, missed general practitioner (GP) and hospital appointments cost the National Health Service (NHS) and the United States an estimated £912 million and $150 billion per year respectively (National Health Service [NHS], 2015), and 48% of these appointments are missed due to simple reasons such as forgetfulness (Deloitte, 2016). According to WHO (2018), there is up to nearly 42% missed appointment rate in medical setting in Africa, out of which 52% is associated with forgetfulness. While Altuwaijri et al. (2012) recommends that missed appointments can be reduced by reminding patients about their appointment in advance, WHO (2018) suggest a systems approach in addressing issues of missed appointments, including bringing together all systems factors responsible for service

delivery. Literature shows that the simplest way to do this is through first intervening on the systems, then reminding patients using electronic text notifications. According to the In
ternational Telecommunication Union 2017 report, there is an estimated 7.7 billion mobile phones used in the world which is approximately one phone per person on the planet. This means that there is a high likelihood that most patients own phones. This would make these patients available on phone for ease of access for reminders.

In Africa, according to the WHO (2016), some countries pay almost double what they should for drugs, and that at least half of the medical equipment in developing countries is unusable or lie idle (Arora et al., 2015). In addition, much of the medical equipment donated to developing countries is also useless. In some countries, almost 80% of health care equipment comes from international donors or foreign governments, much of it remaining idle (Baker et al., 2015). One of the reasons health resources go to waste is because of unused resources from inaccessibility. According to the WHO (2018), missed appointment is one of the major reasons health resources remain unused or wasted. Governments allocate funds to health services; invest in expensive medical equipment, but patients do not turn up for the services leading to inefficiencies in resource use (Akhigbe et al., 2011). Even though forgetfulness in the part of health service consumers contributes nearly up to 52% of missed appointment rates leading to inefficient resource use in Africa (Guy et al., 2012), missed appointments can be addressed through a system approach that focuses on both the providers and the consumers. While facilities try to curb issues of forgetfulness by use of reminders, a lot of resources still go to waste or unused due to high missed appointment rates due to lack of effective patient reminder system (Prasad & Anand, 2012), and support from organizational factors. The number of appointments that patients do not attend compared with the total number of scheduled appointments

is the missed appointment rate. Missed appointments in health care results in wasted resources and disturbs the planned work schedules. In addition, patient management is affected because the hospitals waste a lot of time preparing, locating and retrieving for patients in vain. When a medical appointment is missed without canceling in advance, it results in a vacant appointment slot that cannot be offered to others (Balato et al., 2013). Many other patients with immediate need for health care are forced to wait longer to receive care because the facilities expect high patient turnout. The efficiency of the health system is thus hindered. A study by Bangure et al. (2015) on evaluating the financial significance of missed appointments revealed that missed appointments result in allocated resources not being utilized or wasted. For example, staff gets paid, even when patients do not attend. Cost increases of this nature are unwelcomed in developing countries, where resources are already extremely limited. Therefore, using a systems approach on health system factors would limit missed appointment rates. According to the WHO (2018), systems approach means finding and addressing challenges in all the health system factors such as human resources, organizational factors and patient factors that hinder service delivery and consumption. Addressing these challenges would ensure high clinic attendance.

In Kenya, based on a study by Nyakundi et al. (2015) on health budgeting in Kenya, 22% of health resources go to waste or are unused. This has been attributed to missed appointments due to factors such as human resources, organizational practices, and patient factors. Haji et al. (2016) reported about 44% missed appointment rate in PNC clinics in their study to reduce routine vaccination dropouts in Kenya. A report by Kimeu et al. (2015) on medical adherence associated these missed appointments with forgetfulness on the part of consumers, asserting that out of all missed appointments; nearly 58% is attributed to patient forgetfulness. In the fiscal year 2018/2019, Kenya

allocated Sh 90 billion (5.4 per cent) of the budget for healthcare services according to the 2018 Economic Survey. This is projected to increase in the coming years due to the country's efforts to attain universal health coverage by 2022 for every citizen. Given this substantial investment, there is urgent need to limit opportunities for wasted resources such as those attributed to missed appointments. Patients who miss appointments contribute to inefficient use of resources and create loss of revenue (Bogart et al., 2014). Such patients are likely to experience poor medical adherence, demonstrate adverse prognosis, and go through relapse. They also cause emotional and financial burden to their caregivers (Youssef et al., 2014). Missed appointments waste man-hours for physicians who eventually experience decreased empathy levels, and lead to the break-down of communication between patients and doctors (Boker et al., 2012). In addressing consumer forgetfulness, the use of mobile phones to send reminders have been shown to dramatically reduce missed appointment rates at general medical and mental health clinics around the world (Brannan et al., 2011). Mobile phones can easily be accessed by many patients. According to the Communications Authority of Kenya in its first quarter of the 2017/2018 Financial Year report, there are 41 million mobile subscribers in Kenya. This would ease the process of reminding patients about their appointments as a part of the system approach of addressing missed appointments.

Kenya is still rated among one of the top countries with the highest neonatal deaths globally. The Kenya government to this effect provided free maternal health services that included antenatal and delivery care in first-level government health facilities from June 2013. However, many visits are still missed. According to UNICEF (2017), 502,860 children were not immunized in 2017, and among children born between 2013 and 2017, 1.7 million were not fully vaccinated. According to 2014 Kenya Health and Demographic Survey (KDHS), Kenya has 58% and 53% ANC and PNC

coverage, respectively. ANC coverage (at least four visits) in Kisumu and Homabay counties are 68% and 61% respectively. In addition, Kisumu and Homabay counties have PNC coverage of 69% and 61% respectively. Kisumu and Homabay have 75/1000 and 91/1000 under-five mortality respectively according to Kenya Health and Demographic Survey [KDHS] 2014 report. The prevalence of HIV/AIDS in Homabay and Kisumu counties are 18.9% and 12.6% respectively with poverty levels up to 50.3%. While these factors also cause under-five mortality, uptake of ANC services from earlier stage may help detect the infection and effective measures taken to prevent transmission to the unborn child. Even after the Multiple Indicator Cluster Survey Reaching Every Child (REC) approach in 2015-2016, the number of children under one year in Kisumu and Homabay counties who were fully immunized increased to only 66% and 71.3% respectively. This means that there are still a large percentage of children not receiving PNC despite the efforts to avail the services at no cost, and this is due to the high missed appointment rates. In 2019, Homabay and Kisumu Counties had 42% and 35% of their ANC appointments missed respectively according to 2019 Hospital Did Not Attend Reports. With these alarming statistics, this study seeks determined the effect of a systems approach intervention on adherence to appointments in ANC and PNC clinics in public hospitals in selected counties in Kenya.

1.2 Statement of the Problem

The world wastes nearly up to 40% of health care resources according to 2018 World Health Report, and 56% of these wasted resources are attributed to missed appointments. Missed appointments, in 2015, cost the United States and National Health Service up to $150 billion and £912 million annually respectively (Deloitte, 2016). Boksmati et al. (2016) places missed appointments in African medical setting at about 42%. In Kenya, Nyakundi et al. (2015) cited that 22% of health resources are unused

or wasted because of missed appointments. Haji et al. (2016) and Kimeu et al. (2015) agree that Kenya has about 44% missed appointment rate in PNC and ANC clinics caused by health facility practices and patient factors.

Despite the free maternal health services in first-level government health facilities since June 2013, Kenya still has 58% and 53% ANC and PNC coverage, respectively. According to UNICEF 2017 Annual report, under one year old children receiving all vaccines declined from 78% to 54.8%, skilled birth attendance from 56.4% to 45.1%, and women accessing at least 4 ANC visits from 37.8% to 28.3% in 2016 and 2017, respectively. 502,860 children were not immunized in 2017, and 1.7 million children born between 2013 and 2017 did not receive all prescribed vaccines, this has been attributed to missed PNC appointments (UNICEF, 2018). Patients who miss appointments contribute to the country's high under-five mortality rates (45.6/1000), create inefficiencies in resource use in terms of lost time and wasted dedicated resources. By reducing missed appointment rates, the under-five mortality rate can be reduced, maternal and child health improved, and health care providers can improve efficiency in resource use.

According to KDHS, ANC and PNC coverage in Kisumu and Homabay counties are 68% and 61%; and 69% and 61% respectively. Based on the Multiple Indicator Cluster Survey (MICS) report, Kisumu and Homabay have 75/1000 and 91/1000 under-five mortality, respectively. The prevalence of HIV/AIDS in Homabay and Kisumu counties are 18.9% and 12.6% respectively with poverty levels up to 50.3%. While these factors also cause high under-five mortality, uptake of ANC and PNC services from earlier stage may help detect the infections and effective measures taken to prevent transmission to the unborn child. Even after the MICS' Reaching Every Child (REC)

approach in 2015-2016, the number of children under one year in Kisumu and Homabay counties who were fully immunized increased to only 66% and 71.3% respectively. This means that there are still a large percentage of children not receiving ANC and PNC despite the efforts to avail the services at no cost, and this is due to the high missed appointment rates. In 2019, Homabay and Kisumu Counties had 42% and 35% of their ANC appointments missed respectively according to the 2019 Hospital Did Not Attend Reports, resulting into the alarming under-five mortality rates in these counties. The financial expense of missed appointments keeps increasing the cost of the health services and decreasing the efficiency of resource use in these counties because the outpatient service must still pay the salaries of clinicians and administrative staff.

No study has been done in Kenya with a focus on health systems approach intervention. Many studies done have examined such problems in isolation. The lack of systems approach in addressing these challenges lead to fragmented solutions that do not solve the intended problem, and often introduce unintended issues. There is limited identification of system components, interdependencies, and how tasks can be coordinated to solve the problem of missed appointments. While many studies tend to solve these issues, the solutions do not last because of the lack of systems approach to problems. Therefore, this study sort to approach healthcare as a whole instead of parts through a systems approach intervention on health system factors such as organization of MCH services, health workers, access factors, and patient characteristics.

1.3 Purpose of the Study

The purpose of this study was to address the challenge of increasing missed appointments in MCH clinics in Homabay and Kisumu County hospitals. Despite maternity services being free in public

hospitals, about 42% and 35% of all antenatal appointments are missed in Homabay and Kisumu County hospitals, respectively. Therefore, the study was done to determine effect of a health system approach intervention on adherence to appointments in antenatal and postnatal clinics in public hospitals in selected counties in Kenya.

1.4 Research Objectives

The following were the objectives of the study:

1.4.1 Broad Objective

To determine effect of a health system approach intervention on adherence to appointments in antenatal and postnatal clinics in public hospitals in selected counties in Kenya

1.4.2 Specific Objectives

1. To determine the influence of organization of MCH services on adherence to appointments in antenatal and postnatal clinics in public hospitals.
2. To establish the contribution of health workers factors on adherence to appointments in antenatal and postnatal clinics in public hospitals.
3. To determine the influence of access on adherence to appointments in antenatal and postnatal clinics in public hospitals.
4. To investigate the influence of patient characteristics on adherence to appointments in antenatal and postnatal clinics in public hospitals.
5. To determine the effect of system-wide communication on adherence to appointments in antenatal and postnatal clinics in public hospitals.

1.5 Research Questions

1. What is the influence of organization of MCH services on adherence to appointments in antenatal and postnatal clinics in public hospitals?
2. What is the contribution of health workers factors on adherence to appointments in antenatal and postnatal clinics in public hospitals?
3. What is the influence of access on adherence to appointments in antenatal and postnatal clinics in public hospitals?
4. What is the influence of patient characteristics on adherence to appointments in antenatal and postnatal clinics in public hospitals?
5. What is the effect of a system-wide communication on adherence to appointments in antenatal and postnatal clinics in public hospitals?

1.6 Justification of the Study

Maternal and child health is among the health priorities in most countries in the world and in Africa (WHO, 2018). Many studies have been done that focus on improving maternal and child health in the efforts to achieve sustainable development goal number (SDG) number 3 (good health and wellbeing, and the millennium development goals (MDGs), especially number four (to reduce child mortality) and five (to improve maternal health). Different researchers have come up with different mechanisms to ensure the achievement of these goals, and most of these measures have been implemented successfully across the world (Jordan et al., 2019). Africa has had its share of mechanisms, and many studies have been done to improve service uptake in Africa. However, few have been done on reducing missed appointments and to improve efficient use of health resources in

antenatal and postnatal clinics, especially in Kenya. The government of Kenya, since June 2013, has been providing free maternal health services that includes antenatal and delivery care in first-level government health facilities.

Kenya is still among the top countries with the highest contribution to the neonatal deaths in the world, with antenatal and postnatal coverage still remaining low at 58% and 53% respectively according to UNICEF (2017). In addition, the government continues to pump more resources towards maternal and child health, but still face challenges of unused or wasted resources (22%) due to high missed appointment rates for one reason or another. With Kimeu et al. (2015) attributing these missed appointments to facility practices and patient factors such as forgetfulness, it is therefore, justifiable to attempt to address these alarming coverage statistics by implementing a system approach intervention to reduce missed appointment rates. This study intervened by implementing a system-wide communication through reminders in antenatal and postnatal clinics and public relations initiatives in the facility to reduce missed appointment rates. Nevertheless, this study examined other factors that possibly contribute to the low coverage in these clinics such as access (opportunity cost and facility location), organization of MCH services (patient waiting time and consultation process), health workers (staff responsiveness and staff attitude) and patient characteristics (age and socioeconomic factors). In addition, there was an assessment of different patient appointment reminder systems (phone call and SMS) to determine their effect on adherence to appointment in ANC and PNC clinics in public hospitals in Kenya from which conclusions and recommendations were drawn.

1.7 Limitations of the Study

While there are over 41 million mobile subscribers in Kenya according to the Communications Authority of Kenya, limitations were experienced due to limited number of mobile phones in the rural counties where the study was done. Some participants did not own mobile phones, and some were out of network coverage in some instances when phone calls were made, and therefore, were not available on phone. The fear of corona virus among ANC clients was a huge challenge and many cited hospitals as hotspots. The health workers also resisted change introduced by public relations initiatives in the beginning. Access to information within the hospitals was also a challenge due to the sensitivity of the information as some health workers were not willing to fully disclose the information initially. Also, the hospital managers at Kisumu County hospital declined to be interviewed during the end line survey since the facility was not selected as the intervention hospital. They cited that nothing has changed since the baseline study.

Due to the limited number of mobile phones, the study included the spouses or relatives in the same household as alternative contact person through which the reminders were made. Issues of network coverage were factored in the number of phone call attempts. The ANC clients were also sensitized about corona virus, which saw a reduction on perception that hospitals are the hotspots. The health workers were educated on the relevance of adopting the proposed changes to reduce missed appointments. Hospital heads were also involved in the study for collaborations, and this made access to the required information easy. ANC clients also provided enough information during the end line study, and therefore, the decline of the managers to speak at this point did not affect the findings of the study in anyway.

1.8 Delimitations of the Study

The study was delimited by certain factors that were beyond its control. For example, the types of participants available were only those at the end of their first trimester. Many participants shied away from health facilities due to the fear of contracting coronavirus, which prolonged recruitment of the participants. The study could also not intervene on issues of access to services such as opportunity cost and proximity to the facility, and socioeconomic factors affecting ANC clients. The study which was set for seven months also ended two weeks to predetermined end date because of COVID-19 lock down measures. Also, the study lost four participants in the process as one was reported dead and the other three could not be reached during the end line survey.

1.9 Significance of the study

This study is important because it introduced a health system approach intervention on health system factors to reduce missed appointment rates in antenatal and postnatal clinics in public hospitals in selected counties in Kenya. As a result of reduced missed appointments, individual families are likely to experience good health for their children and mothers, and reduced under-five mortality rates. Health facilities will experience minimal wastage of resource and efficiency, especially in terms of perishable vaccines and man hours. Nevertheless, the existing minimum antenatal and postnatal coverage is likely to be increased due to the increase in uptake of antenatal and postnatal services. Since antenatal and postnatal services are often provided at no cost, but still experience minimal coverage, the study examined other health system factors that contribute to missed appointments such as access factors (opportunity cost and proximity to facility), organization of MCH services (patient waiting time and consultation process), health workers (staff responsiveness and staff attitude), and patient characteristics (age and socioeconomic factors). Based on the findings that the study

generated, vital recommendations have been provided on how to reduce missed appointment rates in public hospitals in Kenya. These recommendations are significant in reducing under-five mortality rates, and increasing both PNC and ANC coverage, as well as improving efficiency in health resource use in Kenya.

1.10 Assumptions of the study

The following were the assumptions made during the study:

1. That the services needed by the ANC clients will be available and provided when appointments are honored.
2. That ANC clients will respond and adhere to the reminders communicated through phone calls and messages.
3. That healthcare workers will be available and cooperative during the intervention and adhere with suggested improvements.

1.11 Operational Definition of Terms

Terminology	Definition as used in the study.
Access Factors	These are factors associated with seeking and receiving health care services. They include factors such as distance to the hospital or proximity to the hospital and opportunity cost of seeking care, when a patient has to abandon an income generating activity to seek health care.
Adherence	This is honoring scheduled appointments. It achieved when patients turn up for the appointments on the scheduled dates.
Antenatal Visit	This is when an ANC client avails herself for the ANC service. It also includes readiness and willingness to receive ANC services.
Appointment	This is a scheduled day and date when an ANC client is supposed to visit the hospitals to receive ANC services offered.
Health System Factors	These are components of healthcare that work together interdependently to achieve optimum service delivery. They include health workers, organization of MCH services and facility infrastructure.
Health Workers Factors	These are factors associated with or contributed by health workers that in one way or another influence or inhibit health service delivery. They include staff attitude towards clients, staff responsiveness, consistency and availability for service delivery.

Health Systems Approach	This entails viewing healthcare as a whole made of interrelated and interdependent parts. It involves integrating processes, people and technology through multiple interventions to improve health system factors for better service delivery. It aids to understand the relationship and connections between health system factors.
Missed Appointment	This is the failure of an ANC client to attend or fulfill a scheduled visit on a particular day. An appointment is considered as missed when the client does not turn up the entire hours of operation on a specific scheduled date.
Opportunity Cost	This is the cost of the forgone activity. It entails the cost of the alternative where the patient has to choose between seeking care and going to work. The cost of the forgone activity is the opportunity cost.
Organization of MCH services:	These are factors that influence the delivery of MCH services and the decision to turn up for those services. They include factors such as consultation process, patient waiting time, and cleanliness of the facility.
Patient Characteristics	These are patient variables that influence the decision to turn up for scheduled appointment. They include age, socioeconomic factors, and sociocultural factors.
Patient Waiting Time	This is the period, in minutes, that patients wait before being attended to at any single point of care.

Patient Reminders	These are the mechanisms of sending reminders to patients about their appointments. They include phone calls and SMSs.
Postnatal Visit	This is when a PNC client avails herself for the PNC service. It also includes readiness and willingness to receive PNC services.
Public Relations Initiatives	These are initiatives that promote the way in which health workers treat and attend to patients. They include customer care training, Information, Education and Communication, Facility cleaning exercises.
Responsiveness	The extent to which client needs and expectations are met in terms of how the services are modeled towards their expectations, inquiries, and general satisfaction with the service.

System-wide Communication: This is a form of relaying educative and health promotion messages to both patients on the relevance of adhering to appointments, and health workers on the best ways to handle and treat patients in the process of offering care.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Strengthening service delivery and health financing is important in the achievement of universal health coverage and health equity. At PNC and ANC clinics level, this is vital in reducing antenatal deaths and under-five mortality. While issues of affordability and availability of ANC and PNC services have been addressed, many countries still cite missed appointments as a major concern for increased under-five mortality rates. Studies have been done to seek mechanisms of addressing issues of missed appointments. Previous studies have cited patient appointment reminders as an effective measure in reducing missed appointment rates in medial setting. Where patients are reminded about their medical appointments, they have the avenue to confirm or cancel the appointment, which in turn offers an opportunity to reschedule or offer the slot to another deserving patient. This ultimately strengthens service delivery and health financing as a pillars of health systems. Implementation of patient reminder systems, however, requires commitment of the governments in terms of financing and facilities in terms of execution. While patient reminder systems have been cited in previous studies as a means to limit missed appointments, many factors have been cited as reasons for these escalating missed appointments. Literature shows that health workforce and organization of maternal childcare services (MCH) are major contributing factors in missed appointments. Dean, et al. (2012) argues that while factors such as access to services have been continuously addressed, patients continue to miss their appointments for simple reasons such as forgetfulness.

The problem of missed appointments is very prevalent in outpatient clinics across the globe. Studies show that missed appointments can result in extended waiting lists and underutilization, wastage of health resources. For instance, Thomas et al. (2017) cites that missed appointments lead to lost

clinician time and delayed access to health care for other patients. Missed appointments have also been associated with low health outcomes for patients because of lack of continuity of care. Taylor (2012) added that the financial expanse of a missed appointment is significant and increases the cost of healthcare service, something that hinders accessibility. Stubbs et al. (2012) established that the health facilities still have to pay for the room, salaries, equipment and administrative costs of setting up an appointment even after patients fail to honor those appointments. Thomas et al. (2017) reported that missed appointments lead to increased costs of care delivery, increased appointment waiting times, underutilization of personnel and equipment, reduced patient satisfaction, reduced appointment availability, and negative relationships between patients and staff. According to Stubbs et al. (2012), missed appointments may delay provision of health services which results in no follow-up of chronic conditions ultimately leading to complications, unnecessary suffering, and costly hospital admission. Several factors have been associated with missing appointments such as forgetfulness, organization of MCH services, availability and competency of health workers, cost of accessing services and patient characteristics. It is, therefore, vital that costs associated with missed appointments are limited by reducing the cases of missed appointments. A lot of interventions such as SMS have been taken in the past and have showed a great impact in reducing missed appointment rates. In addition, phone calls and emails have also been used, and significant results are evident. However, different studies have depicted variations in such results.

2.1.1 Effects of Missing Antenatal Care

Studies show that ANC coverage is becoming a success story in Africa. According to Kirigia (2013), 69% of pregnant women have at least one ANC contact. However, WHO (2015) suggests that in order to obtain a full life saving potential that ANC promises for babies and women, at least four

visits of focused antenatal care, essential evidence-based intervention is required. These essential ANC evidence-based interventions include identification and management of obstetric complications such as tetanus toxoid immunization, preeclampsia, intermittent preventive malaria treatment during pregnancy, and identification and management of infections such as sexually transmitted infections and HIV. ANC also provides an opportunity to promote the use of skilled birth attendance and healthy behaviors such as early PNC, breastfeeding, and planning for optimal pregnancy spacing. Many of these opportunities are continuously missed for one reason or another. Many studies have been done on how to improve and strengthen ANC in order to provide the priority interventions, especially with the shortage of human resources for health in Africa. Other studies have focused on the challenges and barriers of increasing ANC quality and coverage, and how to overcome them. While many countries offer both ANC and PNC services at nearly no cost, coverage has remained an issue in some countries with many missed appointments experienced in ANC and PNC clinics. According to Gross et al. (2012), some mothers miss their appointments for simple reasons such as forgetfulness.

The high ANC coverage and repeated contacts between the health services and the pregnant women provide many opportunities for offering evidence-based interventions likely to affect fetal, maternal, and neonatal survival and health. ANC represents a significant entry point for various health programmes as well as the provision of integrated care. More often, pregnancy represents the initial opportunity for a woman to establish contact with the health system. There is a huge gap between a single ANC visit and optimum ANC, which requires follow up visits and various preventive interventions. Many conditions that have been and still are prevalent in Africa such as sexually transmitted infections, malaria, neonatal tetanus, tuberculosis, HIV, and some nutritional deficiencies can be tackled during ANC care visits (WHO, 2016). Most of these conditions may worsen pregnancy

outcomes if not managed effectively, especially malaria and HIV. Thus, it is particularly beneficial to integrate ANC with other health programmes, both for the baby and the woman who receives better care, and for the health system because health programme costs and missed opportunities can be reduced.

ANC provides a chance to develop an emergency and birth preparedness plan. WHO (2018) recommends that all pregnant women to have a written plan for dealing with birth and any other unexpected adverse events such as emergencies or complications that may occur during childbirth, pregnancy or even postnatal period. In addition, the World Health organization stresses that ANC visits offers an opportunity to promote lasting health and offers benefits that continue beyond the period of pregnancy. This ranges from preparedness for pregnancy, and also extends to cover counselling for the pregnant women and their families, health information. Some of the practical lessons and benefits that ANC offers include relevant information, advice and education concerning proper nutrition and rest, promotion of exclusive breastfeeding, smoking cessation, parenting skills, feeding options for HIV positive women, and avoidance of alcohol. In addition, ANC offers guidance on family planning, seeking necessary care, pregnancy spacing, and caring for the newborn.

According to the WHO (2015), good care during pregnancy is vital for the development of the unborn baby and the health of the mother. Pregnancy is an important stage to promote parenting skills and healthy behaviors. Good ANC is a strong linkage between the mother, family and a formal health system. It also increases the probability of using skilled birth attendants and contributes to good health in the life cycle. Insufficient ANC during pregnancy breaks a critical link in the continuum of care and has adverse effects on babies and women. WHO (2016) estimated that over 25% of maternal deaths take place during pregnancy. This varies with countries depending on the prevalence of

violence, unsafe abortion and diseases in the area. In addition, between a third and a half of maternal deaths are caused by antepartum hemorrhage and hypertension, which are directly related to insufficient care during pregnancy (WHO, 2016). In a study conducted by Lincetto et al. (2012), a third of all pregnant women experience illness during pregnancy, out of which over 3% require medical attention. In addition, some pre-existing conditions become sever during pregnancy. WHO (2016) associates HIV/AIDS, malaria, malnutrition, and anaemia with increased new-born and maternal complications, including death where there is high prevalence of these conditions.

Lincetto et al. (2012) suggested that women who have undergone female genital mutilation are more likely to experience complications in childbirth and continue to recommend that such women be identified and given more attention during ANC visits. Exposure to workplace hazards and gender-based violence are also additional public health problems that need to be captured in ANC because of the associated depression among pregnant mothers Lincetto et al. (2012). According to Central Statistical Agency [Ethiopia] and ICF International (2012), some societies in Africa believe that grieving or mourning stillborn child is not acceptable. This makes the death of a baby in the last trimester even more difficult to process and accept. In sub-Saharan Africa, more than 900,000 babies perish as stillbirths in the last 12 weeks of pregnancy (Central Statistical Agency [Ethiopia] and ICF International, 2012). Lincetto et al. (2012) found out that babies who die prior to the onset of labor, or antepartum stillbirths account for over two-thirds of stillbirths in nations where the rate of mortality is greater than 22/1000 births, which is nearly all countries in Africa.

According to the WHO (2016), antepartum stillbirths occur due to various causes including pregnancy complications, maternal infections such as syphilis. In addition, there are many health

concerns affecting newborns during pregnancy such as restricted fetal growth and preterm birth, as well as other factors affecting the development of the baby like fetal alcohol syndrome and congenital infections (WHO, 2016). The belief and context of family, social and community affect health during pregnancy either negatively or positively. According to Central Statistical Agency [Ethiopia] and International Classification Functioning, Disability and Health (2012), some cultures promote rest and special foods for pregnant women, while others do not acknowledge pregnancy. In such cases, women continue to engage in strenuous activities and nutritional taboos may deprive them essential nutrients leading to deficiencies in protein, iron and certain vitamins. According to Lincetto et al. (2012), pregnant women, in one tribe in Nigeria, cannot say they are pregnant, and they have to say they have "swallowed a cockroach" if they feel unwell.

Preventing health problems for babies and mothers depends on an operational continuum of care with accessible high quality care during pregnancy, childbirth and postnatal period. The prevention of these problems also depends on the available support in helping pregnant women reach services when complications occur. According to the WHO (2016), the goal of an effective ANC package is to prepare for birth and parenthood, as well as detect, prepare, manage or alleviate different health problems during pregnancy that affect babies and mothers such as pre-existing conditions that worsen during pregnancy, pregnancy complications, and effects of unhealthy lifestyles. Accessing ANC is also significant in that it provides mothers and their families with proper advice and information for safe childbirth, healthy pregnancy, and postnatal recovery, including newborn care, promotion of exclusive breastfeeding, and assisting with deciding on subsequent pregnancies so as to improve outcome of pregnancies. According to Kirigia (2013), an effective ANC package is dependent on

competent health care providers in a functional health system with referral services and adequate laboratory support and supplies.

ANC improves the health and survival of babies directly by reducing neonatal deaths and stillbirths, and indirectly through providing an entry point for health contacts with the woman at a key point in the continuum of care. A study by Lincetto et al. (2012) suggests that if 90% of women received ANC, then over 14% more newborns lives could be saved in Africa. This compared with other components of newborn, maternal, and child health packages such as postnatal care and childbirth, the additional lives that would be saved is fewer, partially because ANC already has relatively high coverage and saves several lives already. Nevertheless, the ANC benefits are significantly greater than reduction of mortality alone. Given the low cost of ANC, it is the most cost effective of any public health package. It is highly likely that women will give birth with the help of a skilled healthcare provider if they have had at least one ANC visit (Lincetto et al., 2012).

Even though studies have shown the benefits of ANC through improved health of babies and mothers, the precise ANC components and what to do and what time have remained issues to debate. WHO (2016) recommended a shift from the high-risk approach to focused ANC. This is because the high-risk approach intended to classify pregnant women as “high risk” or “low risk” based on a criterion predetermined and involved many ANC visits. However, this approach has proven to be difficult to implement because many women only had at least one risk factor and not all of them developed complications at the same time, while some low-risk women experienced complications during childbirth. This is why WHO (2016) recommended and supported goal oriented or focused ANC services which provide specific evidence-based interventions for all women. According to the WHO (2018), essential ANC interventions can be provided over four visits at intervals, at least for a healthy

mother without any underlying medical problems. However, the optimum number of ANC visits for a setting with limited resources relies on the costs, effectiveness, and other barriers to access and supply of ANC.

According to a study by Lincetto et al. (2012), providing a focused ANC to a first-time mother and a revisiting mother takes up to 46 minutes and 36 minutes respectively. This is 30 minutes more on average than the current practice, which poses challenges for service delivery. WHO (2015) recommended that it is crucial, for many of the ANC essential interventions, to identify the underlying conditions early. For example, control of anaemia, prevention of congenital syphilis, and prevention of malaria complications require early detection and treatment. Therefore, the initial ANC visit should be done at the earliest stage possible in pregnancy. The last ANC visit should do in 37^{th} week or near the date of birth in order to ensure appropriate care and advice are provided to prevent and manage problems like post-maturity, multiple births, which has a high risk of fetal death and abnormal baby positions (WHO, 2015).

Literature suggests that the first ANC assessment is to differentiate pregnant women who require standard care such as four-visit model from those who require more visits or special attention. According to WHO (2016), depending on a country or setting, about 25 to 30 per cent of women will experience certain risk factors which need more attention. These women require more than four visits. Literature shows that women who own their ANC records are more likely to keep up with their appointments, feel in control of their pregnancy, and ask questions about their health. Therefore, it is important for health care providers to keep pregnant women abreast of their schedules, and where possible remind them to avoid missed appointments. In addition, the role that the community and

household play in ensuring pregnant women do not miss their ANC appointments cannot be underestimated.

During the pregnancy, family plays a major role in terms of support to the women (Gross et al., 2012). This is highly encouraged to ensure that no ANC appointments are missed. Establishing a link between the facility and the community can increase ANC services utilization, and this impact directly on neonatal and maternal mortality as well as stillbirths. Studies recommend that the spouses or mother-in-law or mother be welcomed to participate or attend ANC sessions with the woman. Their support is likely to help the woman follow the recommendations from ANC, improve the health of both newborn and mother, and encourage supported decision making. In most cases, according to WHO (2018), unsupported pregnant women, particularly teenagers, require services that are specially targeted to their needs. Health service providers, therefore, should seek out women unwilling or unable to attend clinics and, where possible take services to them. Community health workers are encouraged to play their role in identifying all pregnant women in the community and offer counselling on healthy lifestyles, complication readiness, birth planning, and the need for ANC and skilled care at birth. This would help in the creation of links between the community and health care system (WHO, 2018).

2.1.2 Antenatal Coverage and Trends

ANC coverage is often expressed as the proportion of pregnant women who have had at least one ANC visit. According to Lincetto et al. (2012), 71% of women worldwide receive any ANC. However, coverage of at least four visits is even lower at 44%. In developed countries, more than 95% of pregnant women have ANC access. In sub-Saharan Africa, study shows that only 69% of

pregnant women have at least one ANC visit, which is more than in South Asia, at 54% (Lincetto et al., 2012). ANC trends show lower progress in sub-Saharan African compared to other regions, with an increase in coverage of only four per cent in the past decade. This indicates an increase in inequity in ANC. According to the WHO (2016), 80% of women, in Africa, in the richest quintile have access to three or more ANC visits, and only 48% of those women in the poorest quintile experience the same level of ANC access. The same disparity has been recorded between urban and rural women. However, within the continuum of care, there is a smaller gap between the poor and the rich in ANC than in skilled attendance during childbirth, which is available to less than 25% of the poorest women in sub-Saharan Africa, and this reaches 81% for the richest (Lincetto et al., 2012).

Literature shows that coverage of four or more ANC visits and the number of visits disaggregated by trimester is vital to assess because the effectiveness of some ANC interventions such as prevention of mother-to-child transmission of HIV, and tetanus vaccination depend on repeated visits and the trimester in which they occur (Kirigia, 2013). The proportion of pregnant women attending the recommended four or more visits, In Africa, increased by six per cent over the past decade. Similarly, the proportion of pregnant women who receives ANC in the first six months of their pregnancy increased by 10% in the last decade, which is faster than the increase of the overall ANC coverage (WHO, 2018). Measuring ANC coverage alone does not give information on quality of care. This is often associated with lack of standards of protocols and care, an insufficient number of human resources for health, especially in the remote and rural areas, poor attitude of health providers, and few supplies and drugs. According to Central Statistical Agency [Ethiopia] and International Classification Functioning, Disability and Health (2012), there are twice as many poorly qualified

health workers in rural facilities than those in urban facilities. Moreover, there is not wide consensus on the quality ANC care indicators.

WHO (2016) cited that possible indicators include measurement of the coverage of essential interventions delivered via ANC and assessment of coverage of four or more ANC visits, with attention to missed opportunities, presenting a gap between those receiving key interventions and those attending ANC, for example syphilis treatment. In some countries, barriers to uptake and access to ANC are cultural and financial in others. Women and their households incur substantial opportunity costs when an ANC visit requires waiting long hours and travel (Gross et al., 2012). Knowledge concerning behaviors and needs of the community as well as formal links with community gate keepers is essential, especially for strengthening the household-to-hospital continuum. For example, in South Africa, ANC consultations increased by 15% in the years following the removal of user fees on the removal of all primary health care services. This affected access and coverage of ANC (Lincetto et al., 2012).

2.1.3 Antenatal Care Interventions Challenges

There are multiple conditions directly or indirectly related to pregnancy that ANC interventions must address in order to respond to the needs of pregnant women. Some of these conditions include nutrition deficiencies, malaria, sexually transmitted diseases, tuberculosis, HIV among other infections. ANC interventions should also provide necessary advice and information on childbirth, pregnancy, and postnatal period (Gross et al., 2012). Studies show that the most effective way of offering effective ANC intervention is through the availability of competent health workers, with good attitude, and integrating health programmes. However, integrating health programmes is easier

said than done. Even though inadequate infrastructure has continually affected ANC than other health services along continuum care, ANC coverage is still affected by supply and demand such as weaknesses in health system and socioeconomic and cultural beliefs. According to Gross et al. (2012), many African countries are still struggling to achieve effective, quality provision of ANC, especially in the rural and peri-urban areas. There is evidence, in health system particularly where policies are ill defined, of competition for money and staff as well as communication with other health programmes such as emergency obstetric care, malaria and HIV (Gross et al., 2012).

African countries, according to Central Statistical Agency [Ethiopia] and International Classification Functioning, Disability and Health (2012) and Ethiopia Demographic and Health Survey (2011), are heavily dependent on donor funding for many health programmes, affecting their capacity to deliver effective, quality ANC to pregnant women. This is coupled with minimum managerial capacity that leads to difficulty in raising funds for essential ANC activities or for attracting and retaining competent staff in the absence of initiatives. In addition, ANC is affected by lack of up-to-date protocols and standards, undefined roles among staff and health programmes as well as weak monitoring systems. (Lincetto et al., 2012) asserts that poor mechanisms of regulations and inadequate capacity to implement regulations contribute heavily to the difficulty in providing and assessing quality care both in private and public ANC clinics. Providing quality ANC has remained a challenge to most African countries, and more often than not, pregnant mothers have remained reluctant to seek those services even though they are relatively free (Gross et al., 2012). Human resources have remained a challenge, especially in the rural areas where deployment of staff has remained difficult because of no career or economic incentives. The available staffs, sometimes, does

not have the required skills to offer all ANC components, or fail to receive the needed support (WHO, 2018).

Effective, quality ANC is a platform to support special groups such as female victims of domestic violence, single mothers and adolescents, among others. These groups, according to Gross et al. (2012), are more prone to preterm birth, stillbirth, child abandonment and neglect, and low birth weight. This is, however, not easy for the ANC providers who are already overburdened struggling to offer health promotion messages with inadequate resources. For example, Lincetto et al. (2012) found out that providing effective, quality, focused ANC takes 30 minutes more on average compared to the current practice, and obviously the time spent providing each focused ANC has implications on opportunity costs for both the clinic and the women, and staffing levels. WHO (2016) noted that shortage of drugs, supplies and basic equipment can adversely compromise the quality of care, utilization of services and motivation of staff. Therefore, there is need for strong health referral systems to support management of cases and pregnancy complications, which inevitably reduces the overall impact of ANC if not managed. As illustrated previously, socioeconomic and cultural barriers also affect ANC coverage, which is lower among women who need the services the most. This includes the poor and less educated in rural areas (WHO, 2018). Literature shows that many pregnant women continue to fail to attend ANC appointments despite being relatively free. In addition, some pregnant women are just not aware of the danger signs in pregnancy and do know how to seek care when a complication occurs. Also, the behaviors and attitude of health workers has been cited as a deterrent to seek ANC services, especially issues to do with privacy, traditional beliefs, and confidentiality of women. These often influence utilization of ANC negatively as well as MCH services at large (Gross et al., 2012).

2.1.4 Effects of Missing Postnatal Care

The Postnatal period is a critical stage for the survival and health of the newborn and mother. The first few hours and days of childbirth are considered vulnerable as it is where many deaths occur. Reports from WHO and Jhpiego (2015) show that at least 870,000 newborns and 125,000 women die in the first week after birth, yet the health programmes and coverage are at their lowest along the continuum of care at this stage. The first day after birth is considered the time of the highest risk for both the baby and the mother. The fact that, in Africa, over 18 million women currently do not give birth in a health facility poses challenges for the implementation of the planned postnatal care (PNC) for the newborns and women (WHO & Jhpiego, 2015). Regardless of where the birth takes place, newborns and mothers spend the first six weeks after birth at home. Studies show that PNC programmes are among the weakest of all child health and reproductive programmes in Africa (Black et al., 2016). This has prompted many studies to look into the mechanisms of increasing PNC coverage and integrating newborn and maternal care in the postnatal period. Lack of care in the postnatal period may result in disability or death, including missed opportunities to promote healthy behaviors that affect newborns, mothers and children (Black et al., 2016).

According to Black et al. (2016), Over 50% of all postnatal maternal deaths take place in the first seven days after childbirth, and majority takes place in the first 24 hours after childbirth. Maternal mortality, in Africa, is often caused by haemorrhage, occurring in postnatal period and accounts for over 34% of maternal mortality deaths. Infection and sepsis is responsible for another 10% of maternal mortality all occurring in postnatal period (Jordan et al., 2019). Study by Jordan et al. (2019) shows that HIV positive mothers are at a greater risk of these maternal deaths than HIV negative mothers. The study also shows that family planning access during early postnatal period is crucial

because lack of proper PNC contributes to frequent, poorly spaced pregnancies. Postnatal period is stressful for newborns and mothers, therefore, well as psychosocial and emotional support should be available for mothers to minimize their risk of going through depression (WHO, 2016). According to WHO (2015) and WHO (2016), sub-Saharan Africa has the highest neonatal mortality rates in the world and continue to show the slowest progress in reducing newborn deaths, particularly those in the first week of life.

At least 1.16 million babies in Africa die in the first 28 days of life annually, and 850,000 of these babies do not live to see past the week in which they are born (WHO, 2016). Asphyxia claims the lives of many babies in the first day, and the most deaths due to preterm birth occur in the first week. 38% of sub-Saharan Africa babies die of infections, especially after the first week of life. Most of these deaths are low birthweight babies, majority of who are preterm (Jordan et al., 2019). Nevertheless, poor development and long-term disability often stem from the early postnatal period and childbirth. According to Black et al. (2016), at least one in four child deaths take place in the first month of life. These deaths occur before children begin to receive care, mostly at six weeks for the first vaccination visit. According to Black et al. (2016), low PNC coverage negatively impacts other maternal and child health programmes along the continuum of care. For example, little or no support for healthy behaviors like breastfeeding can have prolonging effects on children such as malnutrition. In addition, mothers and newborns are often lost to follow up during PNC period for prevention of mother-to-child transmission of HIV (Black et al., 2016).

2.1.5 PNC Coverage and Trends

WHO (2016) estimated that if PNC coverage and curative care during postnatal period could reach 90% of mothers and babies, 10% to 27% of newborn deaths could be averted. This infers that high PNC coverage could save more than 310,000 newborn lives in Africa (WHO, 2016). Postnatal period is a neglected period. Even though most of the newborn and maternal deaths take place within the first week of postnatal period, mothers still tend to miss their appointments for simple reasons such as forgetfulness (Black et al., 2016). The definitions for PNC monitoring are sometimes challenging, including assumptions used in some surveys that all mothers who give birth in facilities automatically receive PNC. Based on the analysis of demographic and health surveys (DHS), over two thirds of women still give birth at home in sub-Saharan Africa, and just about 13% of these mothers receive PNC visit within the first two days. Based on demographic health survey data in Ethiopia, 90% of mothers did not receive PNC visits in the first six weeks. Out of those who had PNC contact, over 50% gave birth in a health facility. In Eritrea, more than 92% of mothers who give birth at home did not receive any PNC in the first six weeks. This is a similar situation with 85% of mothers giving birth at home in Mali and over 70% of women giving birth at home in Rwanda based on DHS data.

According to WHO (2016), a lack of PNC impairs coverage of several important interventions. Even though health home behaviors such as breastfeeding are well described, only 30% of babies are exclusively breastfed in sub-Saharan Africa. A lot of newborns are also found to be cold after birth, including in tropical countries, especially because skin-to-skin care after childbirth is rarely practiced. Family planning is vital for pregnancy spacing and is a significant missed opportunity in the postnatal period. Focused group discussions in Kenya revealed that virtually all women were under the impression that information on family planning could be provided during postnatal visits of before a

mother leaves the facility after giving birth (Lincetto et al., 2012). However, women continually missing their appointments widen the risk of newborn and maternal deaths due to missed PNC opportunities.

2.1.6 Postnatal Interventions Challenges

In spite of the programmatic and policy opportunities existing to strengthen PNC in Africa, there are still several challenges in implementing postnatal interventions. PNC visit keeps continuity of care between maternal and child health services, which supports healthy behaviors that should have been, in the first place, introduced during ANC visits, and continued during labor and childbirth. PNC visit is essential in ensuring seamless continuum of care from home to hospital. It has been noted that the improvement of PNC relies on the accessibility and capacity of local health systems, decentralized decision making level, and common cultural practices, especially those regarding seclusion that may limit seeking care (Jordan et al., 2019). Approaches that could be used to scale up PNC include different possibilities for women who give birth in a health facility and those who give birth at home. Since more than 50% of women and their newborns remain at home during and immediately after birth, it is crucial to integrate care for both the newborn and mother outside the formal health system. Regardless of these approaches, implementation of PNC intervention has remained a challenge in sub-Saharan Africa (WHO, 2016).

According to Jordan et al. (2019), the major gap in the continuum of care is due to the low PNC coverage. In addition, there is scarce research to identify the optimum delivery and timing approaches, and in any case, most are situation specific. However, literature shows that the challenges of PNC interventions may be seen in terms of demand and supply of services. The demand for PNC

is not in doubt, neither is the supply. However, there are many delays in care seeking, especially during childbirth, pregnancy, and the postnatal period (WHO & Jhpiego, 2015). Studies show that delays in care seeking in postnatal period mostly occur because of the restrictions that keep women and their babies at home or work. Lack of information has also been cited as a reason for not seeking care. In many cases, women fail to seek care because they do not understand or recognize complications, sometimes it is because they do not know that the service is available for them. In cases where they understand that care is available, they do not perceive any benefits in attending, even though they tend to welcome the information on caring for their new babies, family planning, and breastfeeding either during pregnancy or childbirth (WHO & Jhpiego, 2015). Studies show that women view childbirth as a major event but perceives PNC with minimal concern. Involvement of the community is, therefore, essential for shortening delays in care seeking after childbirth because family members often significantly influence behaviors. According to Lincetto et al. (2012), in many areas where husbands work far from home, women may wait for them to give permission and pay for the PNC visit. In addition, a lot of societies acknowledge that grandmothers are influential in supporting young women, in sub-Saharan Africa, during pregnancy and childbirth.

Successful implementation of PNC interventions also require the influence of other community gatekeepers such as traditional birth attendants, local leaders, community health workers, and support groups. There is also need for postnatal policy to improve supply of PNC. However, many African countries lack standards, guidelines, protocols and most importantly, human resources to manage mothers and newborns in the early postnatal period (WHO & Jhpiego, 2015). In addition, there is mostly inadequate coordination between different care givers, and weak links between health programmes, as well as improper use of information. In many countries in Africa, unless a woman

decides to seek family planning, she may never receive a check-up until she is pregnant again. Majority of the countries in Africa lack postnatal register, and even if a nurse checks-up new mothers, she may not record her efforts. Countries, such as Kenya has, however, designed a register for at least three targeted PNC visits: within 48 hours, one to two weeks, and finally at around six weeks. This is because studies have proven that the quality of care at the time of childbirth influences newborn care during the period of PNC (WHO, 2018). In areas where there is lack of skilled care, there are very few care givers trained in essential newborn care, and very few courses for midwives and nurses to extend their skills. However, where there is availability of skilled care, care givers are often too busy to think about providing information on the importance of having a PNC check-up for women and their newborns. Studies have also revealed a rare systematic handover between those who care for mothers and those who care for the baby newborn and child, this disconnects, thus occur in the continuum of care. WHO (2018) identified minimal capacity of health management and referral and communication failures at various levels of services that are responsible for failures in successfully implementing PNC interventions. A study from Tanzania suggested that midwives need more support to offer PNC, and that factors that affect health workers in providing PNC include the gap between practice and classroom theory, political awareness, and involvement in policy making (WHO, 2016). Nevertheless, lack of confidence in referral and management of women with complications and limitations in dealing with job stress have also been identified as part of the challenges in successfully implementing PNC interventions. According to Gross et al., 2012), innovative solutions, such as patient appointment reminders have been adopted in other countries to improve PNC coverage, and all countries should build on these experiences. In one study, it was found that many women miss their PNC appointments due to simple reasons such as forgetfulness. When an appointment reminder was implemented, an increase by 18% in PNC visits was noted (Gross, et al., 2012). Such studies

have been replicated in other health service points and continue to provide positive results in service uptake.

Partners and governments can take various steps to scale up PNC services. These include the development of evidence-based PNC package, improving available information to guide decision making, and building and reinforcing links between health facility and the community. Timing and frequency of care is crucial in implementing PNC. Sometimes mothers tend to miss appointments and fail to experience all the benefits of PNC visits. While many countries have adopted the WHO model of care, which suggests PNC visits within six hours after childbirth, six weeks and six months, a large percentage of mother still miss some of these visits, exposing both themselves and their newborns to high risk of contracting infections. The most important time for PNC, according to WHO (2018), is the first 24 hours, which is when most newborn and maternal deaths occur. Where possible, the next PNC contact should be on the second or third day after childbirth, a third PNC visit in the first week should be included where resources permit. According to Gross et al. (2012), the routine visit in the sixth week is essential for the immunization of the baby and the counseling of the mother on family planning. WHO (2016) recommends that countries adopt their PNC package based on their existing policy including healthcare workers. In addition, there is a need for countries to establish leadership at different levels to review, adapt, integrate, and implement a PNC package. Based on the situation of individual countries, government officials and donors need to collaborate to champion PNC for newborns and mothers, including measures to ensure PNC visits are not missed. It is also essential for countries to integrate, coordinate and strengthen PNC package within the existing health programmes such as child survival, initiatives of safe motherhood, early childhood development, and emergency obstetric care (Gross et al., 2012).

In conclusion, many women and their children in Africa lack access to health care during early postnatal period (Gross et al., 2012), putting women at high risk of illness and eventually death. According to WHO and Jhpiego (2015) and WHO (2016), many maternal lives would be saved, and 310,000 newborn deaths would be averted in Africa if the PNC coverage were to reach 90% of babies and women. Enhancing PNC policy and health programmes is essential in increasing PNC coverage in Africa in general. According to the WHO (2016), there is an opportunity to adapt PNC in varying settings in order to reach newborns and their mothers, especially for the 18 million women in Africa who give birth at home.

2.2 The Influence of Organization of MCH Services on Adherence to Appointments in ANC and PNC Clinics

Organization of MCH services are among the major determinants of service utilization. The availability of health care services does not guarantee that they will be optimally used by patients. However, effective and efficient organization of MCH services such as short patient waiting time and effective consultation process could increase the possibility of utilization. Organization of MCH services needs to be aligned with the needs of the patient needs to, at least, guarantee utilization. If the MCH services are to be universal, or a safety net for the poorest, there must be deliberate efforts to improve consultation process and minimize patient waiting time (Garrison et al., 2011). Organization of MCH services such as consultation process and patient waiting time are among the major factors associated with missed appointments. Even when health care services are available, it is not a guarantee that they will be optimally used by patients. However, effective and efficient organization of services such as short patient waiting time, and quick, prompt consultation process could reduce missed appointment rates. Organization of MCH services need to be aligned with the

patient needs to, at least, make it easy to access the services. In order to reduce missed appointment rates, there must be deliberate efforts to reduce patient waiting time (Garrison et al., 2011).

2.2.1 Patient Waiting Time

Patient waiting time is crucial to those seeking health services. It has been established that long patient waiting time can be a deterrent to seeking and utilizing health services. Health services availability of and their provision in a timely manner is important in strengthening the service delivery pillar. Einstein (2012) reported that long waiting time reduces patient satisfaction, and discourages patients from seeking care, resulting in high missed appointment rates. Ideally, patients should be able to access and use services such as primary care, anti-natal and post-natal care confidently and conveniently. According to Einstein (2012), people in the rural setting often experience waiting time as a barrier to healthcare that limits their ability to get the care they need. Reducing missed appointment rates, especially for those seeking anti natal and post-natal care services would ensure sufficient healthcare access, and this can be done by limiting patient waiting time (Einstein, 2012).

There is need for facility managers to initiate efforts to reduce patient waiting time. While availability of services may be a non-issue, especially for anti-natal and post-natal care services, patient waiting time can be a deterrent to delivery and utilization of the services (WHO, 2013). Patients, especially expectant mothers do not want to walk long distances to seek medical care, and then take the entire day waiting to receive health service. Therefore, in order to reduce missed appointments, there should be consistent attempts to reduce patient waiting time. WHO (2013) suggests that adequate health workers and multiple consultation rooms as a means to address long patient waiting time.

2.2.2 Consultation Process

The organization of maternal and child health (MCH) services is an important element in reducing missed appointment rates. The organization of MCH services ranges from consultation process, patient waiting, and health infrastructure which aid in the provision of the services. Consultation process is the stages through which patients undergo in order to finally get served. This influences patient decision to turn up for a scheduled appointment. The extent to which MCH services are conveniently organized for patients encompasses issues such as clinic hours and appointment systems, waiting time, inappropriate eligibility criteria (for example, no family planning services for adolescents), arrangement of rooms, labeling, physical layout and access (for example, ramps for disabled persons), and the mode of service delivery. Consultation process influences patient waiting time, an aspect that has been a subject of discussion in many studies as a factor of patient satisfaction with the medical services and a contributor to missed appointments. In a study by Garrison et al. (2011), it was documented that 30% of patients missed their appointments because the hospitals too many consultation rooms. In their responses as to why they missed their appointments, the patients cited that they do not like how they had to move from one room to another for services they could receive in one consultation. 70% of the patients cited that they would prefer a facility where they can access all the services without having to move from one door to another (Garrison et al., 2011). Therefore, the consultation process is a contributing factor to missed appointment rates.

Consultation process is mostly eased by the availability of adequate health infrastructure. A strong health infrastructure provides the capacity to prepare for and respond to both acute (emergency) and chronic (ongoing) threats to the Nation's health. Health infrastructure is vital in health planning and delivery. Health Infrastructure categories encompass maintenance systems, ward rooms, ambulances,

medical equipment, communication and technology, Amenities, and Patient Flow mechanism. Health facilities should have adequate ward rooms, operational ambulances, medical equipment, and effective communication structures to enable effective delivery of services, an aspect that would motivate patients to continually seek health services. The role of medical equipment cannot be underrated in the provision of health services, especially to ANC patients. Equipment such as X-ray machines, Vaccine fridge, Examination lamp, surgery couch, blood pressure monitors, Doppler, Pulse Oximeter, and scales are some of the most important equipment in aiding ANC service delivery. Without such equipment in functional conditions, many ANC services cannot be offered to the patients. According to Umeh et al. (2013), many patients skip their scheduled appointments because of the lack of medical equipment that can address their concerns. This means an increase in missed appointment rates, which ultimately escalate under-five mortality rates.

2.3 The Contribution of Health Workers on Adherence to Appointments in ANC and PNC Clinics

There is a great need for resources of different nature, workforce included, in reducing missed appointment rates in the facilities. Interventions such as mobile phones require the attention of health workforce for effective implementation. Health workers must be willing to embrace the change in routine that the intervention is likely to bring during implementation such as dedicating time to call or text the patients to remind them of their appointments. Dean et al. (2012) found out that implementing an intervention in the hospitals requires support systems such as human resources for health in order for it to be successful. Therefore, there is a great need of adequate number of competent, receptive health workers. Previous studies have indicated that while there might be just about enough health workers, patients still tend to miss appointments in cases where the health

workers are not receptive to them in terms of attitude and perceptive harassment. Missed appointments can be attributes to human resources for health in many aspects such as their numbers, competency level, and attitude towards patients. According to Dean et al. (2012), reducing missed appointments requires adequate number of competent health workers who support the patients in the provision of health services.

2.3.1 Responsiveness of Health Workers

Staff responsiveness is the ability of health workers to adequately respond and address the needs of the patients in a safe and effective manner. With the limited number of health workers across the world, it is important that health workers remain competent and responsive to patients. There is a serious shortage of human resources for health across the globe, which is referred to as "a crisis in health" by the World Health Assembly (Oppenheimer, 2013). The World Health Organization (WHO) estimates that the health sector requires over 4.3 million health workers to meet the Sustainable Development Goals (SDG), which is a global aim to improve health and well-being, improve maternal health, reduce child mortality, and combat AIDS, malaria, and other diseases (WHO, 2018). The WHO has also reported that out of the 57 countries with critical shortages of human resources for health, 36 are in Africa. In addition, Africa has 25% of the world's burden of disease, but only 1% of the economic resources and 3% of the world's health workers. Oppenheimer (2013) has reported an extreme imbalance in the distribution of health workers worldwide: the nurse-to-population ratio is 10 times higher in North America than in South America, and 10 times higher in Europe than in Southeast Asia or Africa. The study has also indicated that reducing missed appointment rates does not only require health workers, but adequate competent health personnel with the ability to deliver services in a timely manner. Inadequate number of health workers can lead

to missed appointments through limiting supply of the already available services, especially in the rural setting. Patients may be reluctant to attend appointments due to fear of lack of adequate health personnel, that lead to long waiting time before receiving care. Palmer (2011) reported that inadequate competent health workers directly impediment to the delivery of health services. Many people seeking health care services tend to miss appointments if they feel health workers are not addressing their issues of concern.

Due to the huge shortage of health workers in the world which been termed as a crisis in health sector by the world health organization (Oppenheimer, 2013), issues of responsiveness need to be addressed to efficiently make good use of the available human resources. There is a great need of more health workers in order to meet the current need to improve maternal health and reduce child mortality. Many countries have not been able to meet these millennium development goals because of the persistent crisis of shortage of health workers (Oppenheimer, 2013). Africa has been cited as leading with the number of countries with huge health workers shortage even though it has the greatest percentage of the disease burden in the world. While there is an increased effort to curb issues of health workers shortage, concerns are cropping as to whether the recruited health workers are competent and receptive to the patients. Patients tend to show up for appointments in facilities where they are treated well with friendly health workers. Staff attitude is, therefore, becoming a concern in the health sector across the world. Inadequate number of health workers has been cited as a major deterrent to service utilization. Patients tend to avoid facilities with limited number of health workers because of fear of not receiving the available services. In a study conducted by Oppenheimer (2013), it was found that lack of adequate health workers directly impede health service delivery, leading to patients not receiving scheduled services. This has been cited as a major reason for missed

appointments. As seen in previous studies, there is need to increasingly produce competent health workers.

Health care systems and policy makers strive to create competent services which can improve quality of care and health outcomes through responsive health workers. There is a need to train health workers on cultural competence and cross-cultural issues that surround patient care. Studies show that having adequate number of staff is not enough to increase service delivery. Competency and responsiveness of these health workers is as important. Competent health workers possess the abilities, knowledge, and skills that is required to effectively deliver the services to the patients. When a health worker is responsive, he or she is able to identify the patient's health care need and deliver the same effectively. Moreover, responsive health workers tend to motivate patients to keep seeking health services for the betterment of their health. In many areas of health setting, incompetent health workers have been attributed with high missed appointment rates in terms of how they handle patients.

2.3.2 Staff Attitude towards Patients

There is an increasing concern about the effect of attitude of health workers towards patients in health seeking behavior. Literature shows that patients who find health workers less friendly tend to avoid seeking health services in those facilities, leading to high missed medical appointment rates. Staff attitudes can be perceived by patients in terms of being friendly, or even how the staff relates with the patients. Patients tend to avoid facilities where they are not cared for or addressed well. Oppenheimer (2013) suggests that a culturally competent health care system improves health worker patient relations, resulting in quality of care. In addition, patients also tend to show up for their

medical appointments when they are certain about the professionalism of the health care providers. According to Ferlie and Shortell (2011), there is a high likelihood of minimal missed appointments where workers are professional and friendly to the patients. Competent staff has the skills, abilities, and knowledge required to deliver the services to the patients in a friendly manner without any form of discrimination. Health workers who are competent are in a position to identify the health need of the patient, and deliver the same service(s) effectively, thereby encouraging patients not to miss their medical appointments.

Patients often look at the attitude of health workers as either good or bad depending on how they are received or handled. Staff attitude is continuously coming under the spotlight as policy makers start to see the relevance in service delivery and utilization. Studies have shown that in cases where patients find staff with bad attitude, they tend to skip appointments. Hospital staff have been found to link their attitude with the job satisfaction in previous studies. According to Dean et al. (2012), open communication among health workers improves quality of service provision in terms of shared delivery methods. Staff attitude and staff job satisfaction are instinctively linked to patient safety satisfaction with the service, which ultimately lead to reduced missed appointments. For example, nurses who are satisfied with their jobs tend to be happy serving patients. Therefore, it is a great deal for health workers to be satisfied with their jobs as this has a direct impact on their attitude in service delivery. Health leaders are encouraged to create a work environment and culture that are satisfying to the health workers in order to ease and improve their attitude in the delivery of health services. Staff attitude is crucial in ensuring the utilization of health services on the part of the patients, which in turn translate to sustainability and quality of health care provision. Previous literature shows declining job satisfaction among health workers in many countries including Kenya that face related

issues collapsing health care services because health workers are losing their motivation. The quality of care provided depends on the staff job satisfaction. When few health workers are serving a large population, the quality of care is likely to be low and satisfaction levels are expected to decline. The signs of job dissatisfaction result in bad staff attitude, high absenteeism, labor unrest, low productivity, high labor turnover, and industrial action (Einstein, 2012). This may lead to low patient turnovers in fear of poor-quality services, hence high missed appointment rates.

2.4 The Influence of Access to Services on Adherence to Appointments in ANC and PNC Clinics

Utilization of MCH services depends on whether patients are able to access to the services in terms of services availability, affordability, and facility location. Patients tend to utilize services when they are satisfied with them. As Oppenheimer (2013) stipulates, availability of services does not guarantee that they will be optimally utilized by the patients. While previous studies show that MCH services are readily available and affordable, opportunity cost of accessing the services and facility location still impair access. Reducing missed appointments also largely depend on access to the services. If patients are not able to access the services either in terms of service availability of affordability, there is bound to be a high rate of missed appointments in the medical facilities (Kazi et al., 2018). However, availability and affordability of services does not guarantee that they will be optimally utilized by the patients, but contribute largely to reducing missed appointment rates, especially where the patients are reminded of their appointments in time.

2.4.1 Facility Location/ Proximity

The facility proximity or location has also been documented as a great factor that is attributed to missed appointments. According to Wamala et al. (2010), proximity can be measured by distance to the facility, modes of transportation, travel time, as well as any physical barriers that could keep the client from receiving care. According to the KDHS (2014), 18% of Kenyans who are ill do not seek health care because of the cost associated with having to travel. In some instances where facilities are not within close proximity or located far from the people, many health care seekers may not find it useful to attend an appointment even if the services are affordable and acceptable. As KDHS (2014) found out, distance to the facility determines whether people keep their appointments or not, as some people forgoes medical appointments due to fear of long distances and the costs associated with it.

2.4.2 Opportunity Cost of Accessing Services

The opportunity cost of accessing health services refers to the cost of the next best alternative in terms of what is forgone to seek medical services. This is important, especially in the rural areas where poverty is a day-to-day concern. Mothers tend to get occupied trying to make ends meet and would rather stay home working that seek scheduled medical services. Einstein (2012) noted that whether or not a client chooses to pay for a particular service can also be affected by the client's assessment of this service's value. This implies that while a client may have the "hard cash" to pay for a service, s/he could choose not to pay for it because the perceived value does not match the expenditure required. In areas where families hardly have three meals a day, people tend to prefer to work on providing for families that seek medical services that take them a whole day to receive. In many low-income countries, access to good-quality health care is limited and patients face high out-of-pocket expenditures, often for ineffective treatments. According to the study by KDHS (2014), 44% of

Kenyans who are ill do not seek health care because of the high cost of accessing the services, either through forgoing their daily businesses or paying for the service. Therefore, the cost of seeking health services is a key factor that needs to be addressed in order to minimize missed appointment rates and reduce mortality rates. Satisfaction of patients with the provision of services also determines whether they will be willing to leave their business to seek those services. Ideally, patients are often satisfied when the services lead to reduced adverse effects of the illness, and when the patient is relieved of the illness (Oppenheimer, 2013). However, other major factors that can be used to measure patient satisfaction with the service include quality of care in terms provider concern, courtesy, and ability to listen carefully to the problem, and coordination of care.

The probability of seeking health care increases with the ease of service affordability in terms of cost of access or travel. Affordability of services may be a non-issue in MCH services, but an important factor of utilization. Perry (2011) noted that whether or not a client chooses to pay for a particular service can also be affected by the client's assessment of this service's value received compared to what is forgone. This implies that while a patient may have money to pay for a service, he or she could choose not to pay for it because the perceived value does not match the expenditure required or do not bring benefit compared to what is forgone. Sometimes even miss the entire appointment because of the minimal value perceived of the service as compared to the business that earns money to the family. In many low-income countries, access to good-quality health care is limited and patients face high out-of-pocket expenditures, often for ineffective treatments. The cost of services has also been seen in terms of what is sacrificed to seek the services for example, leaving work to go for an appointment. These aspects of cost have a great impact on missed appointments among those in need of health services.

2.5 The Influence of Patient Characteristics on Adherence to Appointments in ANC and PNC Clinics

Failing to honor hospital appointments is a common occurrence in the medical setting and has resulted in a significant loss to healthcare providers. Missed appointment decreases efficiency, higher use of resources and results in a lost time. Prasad and Anand (2012) have associated missed appointments with patient characteristics such as age and gender.

2.5.1 Age

Prasad and Anand (2012) reported that older age was associated with lower missed appointment rate. These findings are similar to those of Sims et al. (2012) that asserted that older people tend to honor their appointments compared to young people. Some of the explanations provided in other studies is that older people are associated with more conditions that necessitate showing up for appointments, and that they are more cognizant of their own healthcare, besides having plenty of time in their schedule. Sims et al. (2012) also documented that missed appointment rates are even lower among women of older age. However, there is not enough evidence about the relationship of gender, age and missed appointment rates. Other studies such as Perron et al. (2013) and Taylor et al. (2012) have suggested that patient characteristics should also be analyzed to help in improving the effectiveness of different appointment reminders. These studies have reported a positive association between patient appointment reminders and patient characteristics.

2.5.2 Socio-economic Status

Literature strongly suggests socioeconomic has an impact on missed appointment rates in health care setting. Gengiah et al. (2014) suggests that challenging socio-economic conditions are detrimental to healthcare in multiple ways, including resulting in missed appointments. In addition, it can be difficult for patients to access resources they need to address their medical needs effectively. According to Prasad and Anand (2012), people with low social status, with low-income bracket tend to have multiple missed appointments compared to their counterparts in middle and high social status and income bracket. The economic polarization and lack of social security system in the society make the poor more vulnerable in terms of choice and affordability of health provider.

According to Gengiah et al. (2014), poverty not only limits people from accessing health services, but also restricts them from participating in making decisions affecting their health, leading to health inequalities. In many developing countries, the magnitude of household out of pocket expenditure on health is sometimes as high as 80 per cent of the total amount spent on health care per annum. This factor determines the ability of a family to satisfy their health care needs. Prasad and Anand (2012) have also reported the impact of literacy level on seeking health services. People with high literacy level tend to honor their medical appointments compared to their counterparts with lower education levels. The same aspect has also been reported as applicable similarly to those in employment and those unemployed.

2.6 Forgetfulness and Missed Appointments

According to the 2018 World Health Report, about 40% of health resources is wasted due to missed appointments. The report shows that up to 48% of all appointments are missed because of forgetfulness. A review of literature shows that patients, especially in ANC and PNC miss appointments for various reasons, one of which is forgetting about the appointments. However, this study focuses on forgetfulness. In a study done by Ullah et al. (2018) on why patients miss their appointments at PNC clinics in Europe, it was reported that 37.6% of patients missed their appointments because they forgot. In attempts to determine why PNC patients would miss appointments even though the services are basically free, Ullah et al. (2018) established that these patients forget about their appointments for various reasons. For example, in this study, 16.1% of the patients reported personal issues and commitments, 21% said they simply ignored because they did not perceive the relevance of such appointments. 33.5% said they were engaged at work and could not remember about the appointment (Ullah et al. 2018). The study recommended that prompting patients about their appointments is the best way to eliminate forgetfulness. The study also suggested SMS reminders as the basic means of reminding patients because of the related costs which are relatively cheap compared to other reminder methods.

Other studies done in different countries shows that forgetfulness causes missed appointments. For example, In the United States, forgetfulness is responsible for between 5% and 55% of missed appointments, 29.5% in Saudi Arabia, 36% in Israel, and 6.5% to 7.7% in the United Kingdom (Ullah et al., 2018). Other studies such as Hermoni et al. (2010) and Detman and Gorzka (2009) concur that forgetfulness has become a major cause of missing appointments in primary care clinics. For example, Hermoni et al. (2010) on analysis of causes of missed appointments in primary care clinics

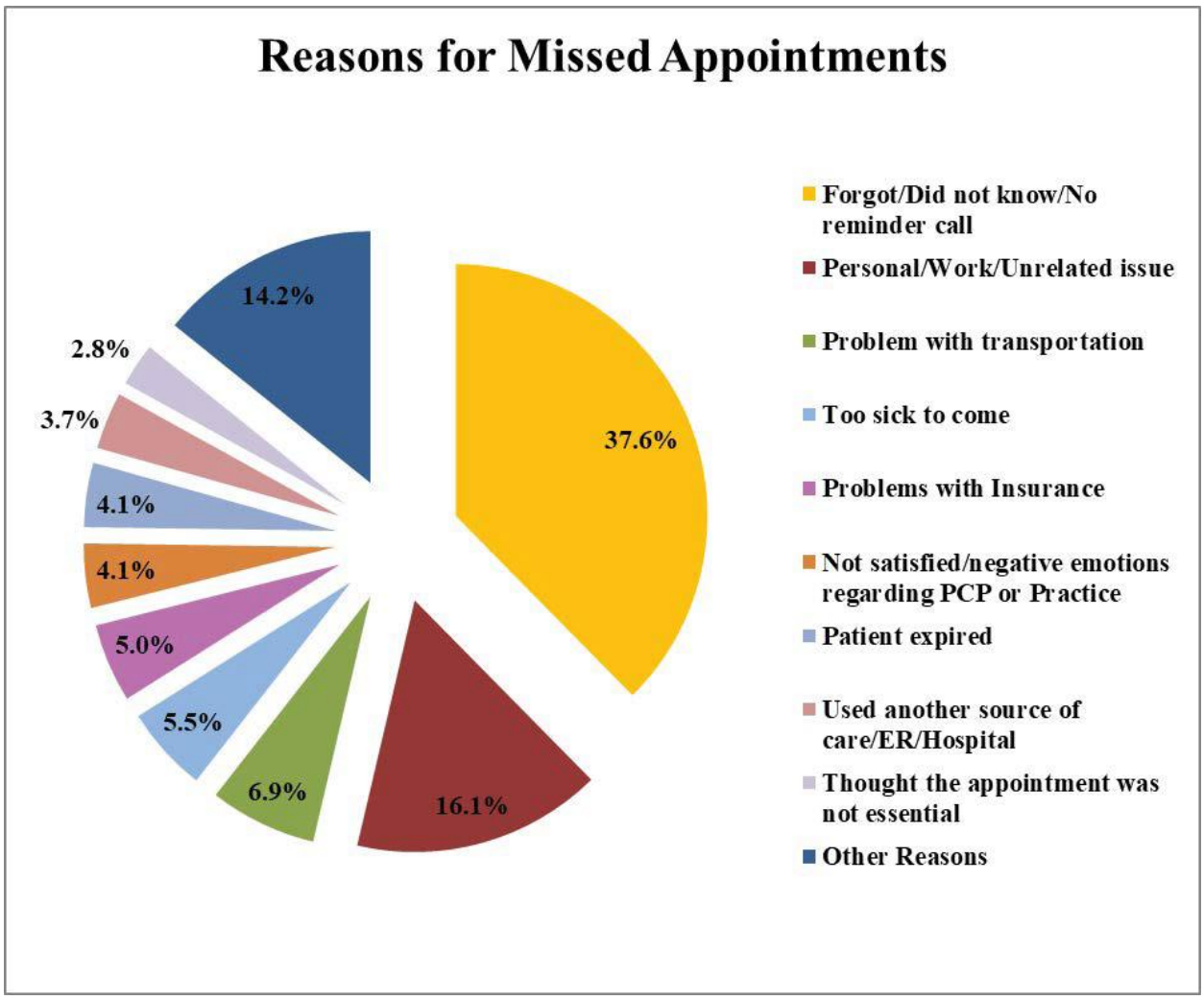
cites forgetfulness due to personal barriers. The study also asserts that people who do not perceive the relevance of the scheduled services tend to forget about such appointments. According to a study done by Detman and Gorzka (2009) in Florida on missed appointments, people with low education and in low socioeconomic status tend to forget about their appointments compared to their counterparts with higher education level.

A study by Barron (2010) in Europe on who misses appointments and why, forgetfulness is reported as a main cause of missed appointments. The study also cites personal barriers such as attitudes towards healthcare, education and various demographic characteristics as contributing factors to forgetting appointments. Neal et al. (2012) in a study of missed appointments in general practice in the UK demonstrated that patients who are most likely to forget an appointment is one who is young, has a large and unstable family, comes from a low socioeconomic group, and has a previous history of missing appointments. In addition, both Barron (2010) and Neal et al. (2012) indicated that patients who live in a deprived area was associated with more than three times increase in the likelihood of forgetting and missing an appointment. In another study by Neal et al. (2015) in the UK about the reasons for and consequences of missed appointments, it was reported that 40% of missed appointments were as a result of forgetfulness.

The following chart shows the reasons for missing appointments as reported by Ullah et al. (2018). From the chart, it is evident that forgetfulness (37.6%) is a major reason why patients miss appointments especially for services that are mostly free.

Figure 2.1

Reasons for missed appointments.



Source: (Ullah *et al.*, 2018)

The situation is not different in Africa. Boksmati et al. (2016) reported in their study on effectiveness of SMS reminders that about 42% of ANC appointments are missed in Africa. The study also established that 52% of appointments were missed because patients forgot. A study by Bangure et al. (2015) in Zimbabwe on the effect of patient reminders on clinic attendance showed that forgetfulness is a great concern in different outpatient clinics. The study cited that low immunization coverage was because of forgetfulness. The study cites about 45% of all missed appointments are due to forgetfulness. In South Africa, Georgette et al. (2017), demonstrates that forgetting an appointment has become a major issue to deal with in primary care clinics, especially ANC and PNC clinics. Patients become preoccupied and tend to forget about their appointments for various reasons. The study suggests that patient reminders can act as a tool to not only remind the patients about their appointments, but also to educate the patients about the importance of attending those appointments. This, according to Georgette et al. (2017), would ensure that patients who simply ignore their appointments are reminded about the severity of the condition, susceptibility to the conditions, as well as the benefits of showing up for appointments. In Mozambique, Davey et al. (2016), did a study on mobile phone text reminders to improve medication adherence, and reported that more than 31% of all non-adherence are basically because of forgetfulness. The study recommends mobile phone reminders as mechanisms to curb issues of forgetfulness.

In Kenya, Haji et al. (2016) reported about 44% missed appointment rate in PNC clinics in their study to reduce routine vaccination dropouts. The study also reported 58% of appointments were missed because the patients forgot. Another study by Dustin et al. (2017) on the use of mobile phone delivered reminders and incentives to improve immunization coverage showed that forgetfulness is one of the reasons why there is low immunization coverage in Kenya. The study introduced incentives

as well as reminders to persuade women to attend PNC appointments. Even though the study introduced monetary incentives, which could have influenced the increased PNC attendance, the study showed a significant decrease in missed appointments due to SMS reminders. Dustin et al. (2017) reported that 90% of children were fully immunized in cases where mothers were sent reminders and given monetary incentive (KES200). Among those who received SMS reminders without any monetary incentive, only about 80% children were reported fully immunized. While the study might have been influenced with the monetary incentive, patient reminders have proven to be effective over forgetfulness. Another study by Mugo et al. (2016) in Kenya, coastal region on the effect of patient reminders on HIV medication adherence reported that appointment reminders through SMS and phone calls increased service uptake by 40%. This shows that patient reminders are effective in reducing missed appointment rates in primary health care. The following section discusses the effect of different patient reminders in reducing missed appointment rates.

2.7 The Effect of Patients Reminders on Adherence to Appointments in ANC and PNC Clinics

Missed appointments are associated with resource inefficiencies and increased cost of services that can be avoided, and this impact on the health of the patient and treatment outcome. Mobile phones systems are increasingly being used to manage these negative effects. Patient appointment reminders are the easiest and quickest way to cut back on missed appointments and connect with patients. According to Gengiah et al. (2014), one single missed appointment a day can cost medical practice anywhere from $40,000 to $100,000 per provider in annual revenue. Bourne et al. (2011) reported that patient appointment reminders can soothe this pain and make patients happier. A study by Perron et al. (2013) in Switzerland among primary care seekers reported that more than 80 percent of patients prefer text message reminders and that most patients missed appointments because they simply forget

about it. Patients can receive appointment reminders that are customized with pre-appointment instructions in the way they choose through SMS appointment reminders and phone call appointment reminders. Patients can then easily confirm or cancel and reschedule.

2.7.1 Phone Call Appointment Reminders

Many studies have compared phone call reminders to other modes of reminders. In Australia, Bourne et al. (2011) compared SMS reminders to phone call reminders in an outpatient clinic and reported that phone call reminders were more effective. The study had patients randomly assigned the intervention SMS reminder or control phone call reminder without considering modality preference. While phone call reminder was more effective than SMS reminder both the modalities showed a reduction in missed appointment rates. In another study by Perron et al. (2013) among primary care seekers in Australia, it was reported that phone call reminders and SMS reminders are equally effective in reducing missed appointment rates, and none is more successful than the other. While the setting of the studies is different, the results indicate that setting may not have a significant impact in the determination of the success of the appointment reminder system. However, these studies all reported the cost effectiveness of SMS reminders compared to phone call reminders. According to Perron et al. (2013), SMS reminders tend to be relatively cheap to implement than phone call reminders.

In the United States, Branson et al. (2013) conducted a study among selected outpatient clinics and reported similar effectiveness for both SMS reminders and phone call reminders in reducing missed appointment rates. The study also noted that the promptness of patients' arrival did not in any way change the attitude of health care providers. The patients were either on time or late by less than 15

minutes in about 96% of the cases. Branson et al. (2013) also studies coordination of care as a concept. This study encompassed transportation arrangement, home visits and babysitting for the appointments scheduled for patients, and even referral to other care services where the need arises. The study reported an increase in outpatient clinic attendance where patients were called and reminded about their appointments. However, the study also revealed that patients that had non-functional phones registered poorer attendance.

2.7.2 SMS Appointment Reminders

SMS reminders are relatively less expensive, easy to customize, can be sent automatically to individuals directly, and forms part of people's daily life (Burton et al., 2014). It is not surprising, given these attributes, that many studies use SMS reminders to intervene in reducing missed appointment rates. SMS reminders can be used for recurring reminders and one-time, distal reminders. Medical facilities have also reported huge financial savings after the implementation of SMS reminders system (Clough et al., 2014). The facilities attribute the financial savings to the relatively less expensive SMS reminder intervention and the reduced missed appointment rates that result from the intervention (Delgadillo et al., 2015). A study done in Kenya by Dustin et al. (2017) to improve immunization reported that SMS reminders help individuals who require additional structure or support to remember a routine or to engage in a behavior. Boker et al. (2012) also asserts that medical professionals can also use the SMS reminder technology to guide the treatment. With this kind of technology, medical professionals are able to receive accurate information about adherence to treatment when treating their patients with less than accurate recall or self-report. According to Dustin et al. (2017) study on improving immunization coverage using SMS reminders and incentives in Kenya, SMS reminders significantly improve health outcome as well as health-

seeking behaviors in sub-Saharan Africa and uptake of immunization the United States. However, there is insufficient evidence that these approaches increase immunization coverage and timeliness in Africa and low-income and middle-income countries.

Other studies such as Branson et al. (2013) done in America in selected outpatients have also cited patient confidentiality issues which have been posed by using SMS reminders. Confidentiality being a risk, Branson et al. (2013) has suggested precautions that would mitigate the concern. These precautions included suggesting that patients use password protection, sending generic reminders, asking the patients to open their messages privately and deleting it afterwards. SMS is, however, inherently insecure technology system, and there is a possibility of exposure of the message unless an encrypted message application is used. There is also a possibility of some patients not reading their messages when received. A study done in China to improve medication adherence by Fang and Deng (2017) mitigated the possibility of patients not reading messages received by utilizing a two-way messaging system that elicits a response from the recipients. While no studies have reported adverse iatrogenic results out of using SMS reminders, Farmer et al. (2014) in their study done in Europe to reduce missed appointment rates in HIV clinic indicated that some patients may become annoyed at receiving several messages over time.

SMS reminders have shown a great promise for use in health care services. A New York study on reducing missed appointments by Finkelstein et al. (2013) found SMS reminders to be highly effective as a medical compliance reminder and appointment reminder. However, there is not much evidence on the most effective number of SMS reminders in terms of frequency, timing and total number of messages, and the conditions under which the dosage should be altered over time. Gengiah

et al. (2014) documents similar results and asserts that the number of SMS reminders varies between patients and often impacted by perceived relevance of the reminder in terms of level of importance to health. A study done by Georgette et al. (2017) in South Africa recommends a further study on the underlying mechanisms making SMS reminders effective in aiding prospective memory. There is a broad array of literature on the use of SMS reminders as an intervention in reducing missed appointments. A systematic review by Hasvold and Wootton (2011), for example, investigated the use of SMS reminders as an adjunct to therapy. Kannisto et al. (2014) studies the use of mobile phone in improving health care in Europe and documented that SMS is not only as a reminder, but also as a supportive mechanism for minority patients who receive cognitive behavioral therapy for depression. Therefore, SMS has been documented as effective in improving prospective memory and supplementing change in behavior intervention.

2.8 Implementation of an Appointment Reminder System versus No Reminder System

There is a lot of inconsistency in evidence concerning the effect of different patient appointment reminders. SMS reminders and phone call reminders have all had mixed results in terms of effectiveness of the intervention. However, the studies have been in different settings so generalizing results may not apply for other settings. One aspect is common across all the studies, implementing appointment reminders is effective in reducing missed appointment rates. Youssef et al. (2014) examined the effectiveness of phone call reminders in an outpatient clinic in Saudi Arabia reported that there was a high likelihood among patients, if reminded one day prior to their appointment by phone call, of attending their appointments compared to if no reminder was made. In this study, the clinic attendance rate increased from 74% to 81%. In addition, the study reported that calling patients helps in documenting cancellation in a timely manner and allows new patients to fill the vacant slots.

This study was supported by Thomas et al. (2017) that investigated automated appointment reminders and phone call reminders in an outpatient clinic in Nigeria. This study reported that it was less expensive and easy to implement automated reminders than calling patients. However, the missed appointment rate reduced significantly, and the clinic increased its revenue over the course of the year.

Studies also show that many clinics have considered postal reminders in reducing missed appointments. A study done in Scotland by Perry (2011) on the use of SMS in increasing patient attendance reported that postal reminders are valuable in reducing missed appointment rates. One group received a postal reminder and the other received no reminder. The intervention group received a postal reminder with a request to return the postcard to the facility if they intended to show up for the appointment. The study reported that there was 33% chance of a missed appointment in cases where the postcard was not returned. Altuwaijri et al. (2012) and Arora et al. (2015) also reported similar findings on the use of SMS reminders in Saudi Arabia and Los Angeles in outpatient clinics, respectively. The studies cited the increasing popularity of mobile phone usage and technology as a reason for the effectiveness of the reminders. Both the studies reported a significant improvement in clinic attendance rates when SMS reminders were sent to patients before the appointments. While the two studies sent reminders in different variations, both studies found a significant reduction in the missed appointment rates. These reports have been supported by Prasad and Anand (2012) who investigated the effectiveness of SMS reminders versus no reminder in a dental clinic setting in India. The study reported up to nearly 40% higher rate of clinic attendance compared to the control group.

2.9 Public Relations Initiatives and Adherence to Appointments in ANC and PNC Clinics

Public relation is a strategic process of communication used by organizations to build mutually beneficial relationships with the public. The main aim of public relations is to keep a positive brand image and maintain strategic relationship with prospective customers and stakeholders. A public relations specialist develops a plan of communication and uses media to maintain a positive reputation with the prospective customers. With the healthcare industry consistently evolving, public relations is becoming a significant aspect in service provision. Healthcare industry requires public relations experts to handle both internal and external communication to promote effective service provision and utilization. According to Ward et al. (2017), public relations addresses aspects of communication, brand building, company advisory services, and growth. However, communications is the most important role in public relations. It ensures customers can communicate their expectations and the facility can provide accordingly. Tengilimoglu et al. (2007) asserts that good public relations is a key to the success of an organization because it helps in addressing challenges and complaints reported by customers. It also ensures that customer expectations are met. With effective public relations, according to Hardy (2017), health facilities are able to avoid delays in the queues and process consultations faster. Directions within the facility should also be marked properly to avoid confusion.

When staff are friendly and communicate with the customers, Hardy (2017) asserts that customers are likely to seek more services. In addition, the waiting area should have cushioned seats for the comfort of the customers. Cleanliness and toilet facility should be improved. Ward et al. (2017), argues that customers are likely to seek services in facilities with clean toilets and comfortable waiting

areas. Public relations also recommend staff training about customer service because the manner in which staff communicates with the customer is likely to affect their relationship. Staff should, therefore, be friendly, and treat customers with respect and dignity to improve service uptake. Patient waiting time is increasingly becoming a major political and health service challenge. Waiting time significantly impairs patient experiences and trust with the health facilities. Public relations is likely to save patients from long queues and waiting time, especially when the service providers understand the need for patients to receive care in time. Most patients ignore appointments because of the fear of long waiting hours. However, according to Ward et al. (2017), if health providers can report in time and have multiple points of receiving care, then patient waiting time is likely to be cut by half. This is a demonstration of significance of public relations to service uptake.

2.10 Theoretical Model

This study is majorly informed by the Health Belief Model (HBM). This model is used to anticipate the health behavior of people. The questions addressed in this model include what it takes for people to act and safeguard themselves from illness (Anderson, 2013). This model, originally developed in the 50s and revised in the 80s, is based in the theory that the willingness of a person to change their health behaviors is primarily due to various factors including perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Anderson, 2013). These variables inform this study as illustrated below. Under perceived susceptibility, people are less likely to change their health behaviors unless they strongly believe that their life is at risk. For example, in this study, ANC and PNC patients who do not think they are at risk of losing their unborn babies and infants respectively are less likely to show up for their clinic appointments. On the other hand, those who understand the severity of skipping medical appointments are more likely to turn up for their appointments.

Perceived severity is another variable in health belief model, which infers that the likelihood of a person changing their health behaviors to avoid the ramification is highly dependent on how much the person considers the consequence to be (Albrecht et al., 2003). For example, if a PNC patient does not understand how serious it is to miss vaccinations, then they are likely to skip an appointment. However, when they understand the necessity of vaccinations, they are more likely to show up for vaccine appointments. Health Belief Model also puts emphasis on perceived benefits as a variable that influences people's health behavior. It is not easy to convince people to change their health behavior if they don't understand what they stand to benefit. Unless ANC and PNC patients are made to understand the benefits of attending all appointments, there is a likelihood of persistent missed appointments. The spouses of these patients should also be engaged so that everyone understands the benefits of attending medical appointments. Another variable that is addressed in the health belief model is the perceived barriers. Many people are reluctant to change their health behaviors because they think it will be hard to change or adjust. In many cases, it may not be about physical difficulty, but social or emotional difficulty. In this study, the spouses will form part of the social and emotional support, and that is why they will be involved as a means of providing support and eliminating barriers to attending medical appointments. This study applied the recommendations of health belief model, which appreciates that people sometimes want to change their health behavior but that is not enough and incorporates more elements (self-efficacy and cues to action) of what may actually help a person change their health behavior. Cues to action are described as external factors prompting people's desire to change their health behavior (Albrecht et al., 2003). For example, losing a child or witnessing an adverse impact of failing to observe appointments. This study used reminders to compel to the emotions of the patients to attend their appointments, indicating what they stand to benefit and the consequence of not observing the medical appointment. Self-efficacy, which

examines someone's belief in their ability to adjust or change health behavior, were assessed among the respondents, and where doubt is observed, the respondents were encouraged, motivated and inspired to observe medical appointments for benefits that were communicated in the reminders.

The study also applied the Transtheoretical Model of change (Prochaska & Prochaska, 2016). The Transtheoretical Model is an integrative, biopsychosocial model that conceptualizes the process of intentional behavior change. Transtheoretical Model focuses on the decision-making of the individual and operates on the assumption that people do not change behaviors quickly and decisively. Rather, change in behavior, especially habitual behavior, occurs continuously through a cyclical process. This is depicted in this study in that just as proposed in the transtheoretical model of change, mobile phones served as prompts or coaching to help facilitate behavior change. According to the model, reminders are like a stop sign at a busy intersection that reminds us how to respond next (Prochaska & Prochaska, 2016). Therefore, reminders can be used to enhance prospective memory, which is remembering to complete an activity in the future, which in the case of this study is attending an appointment.

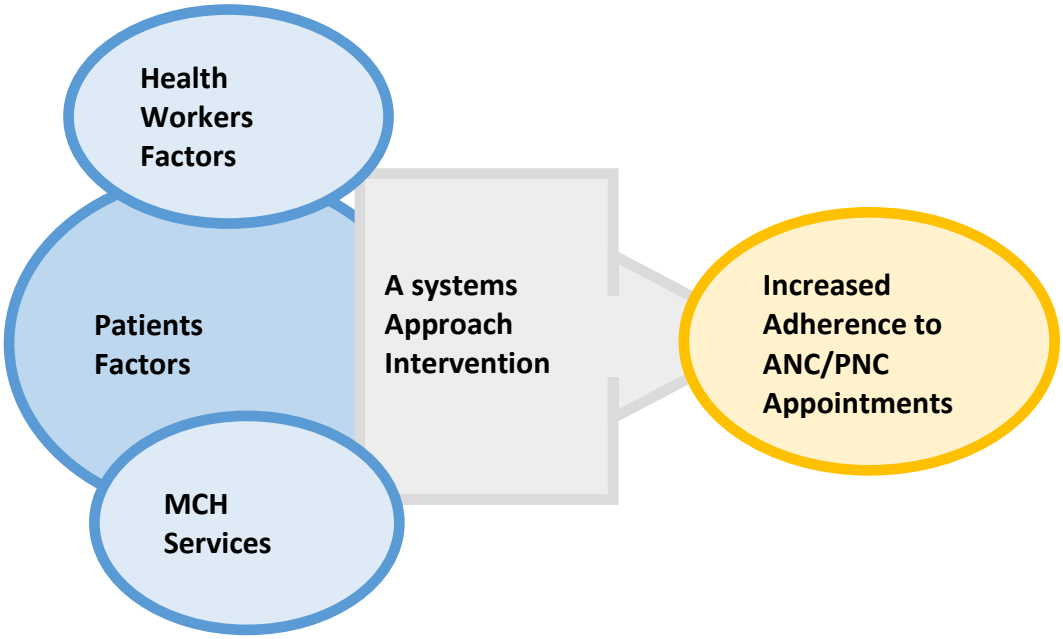
This study is also informed by Complex Adaptive Systems (CAS) Theory. Complex adaptive systems (CAS) theory states that systems with various layers of complexities and levels of network have the ability to learn to adapt to the changing environment (Norberg & Cumming, 2008). CAS theory views human beings as the major components of a system, and motivation and education levels as variables that determine adaptation to changing environment. The theory consists of interacting diverse components, human beings with a capacity for learning that generates a proactive or reactive adaptive behavior. The respondents, components, in this study have the ability to learn and adapt to change which was introduced by the reminders in the study variables. The focus of CAS is on the capacity

and ability of the system to adapt and change itself through learning and reasoning as a response to variations in its conditions or environment. The reminders in the study brought about variations depending on how the respondents responded to them. The study variables demonstrated CAS which supports learning and adapting change as introduced in the system. In this regard, the main variable of a system entails an input, process, output, and outcome.

Another related theory that informed this study was the Systems theory. Systems theory requires all components to function interdependently in a beneficial interrelationship (Ferlie & Shortell 2011). This is defined in this study in that, the same way there are components that must work together to produce a result, to reduce missed appointment rates, there is need for effective intervention, mobile phones, on patient characteristics, organization of MCH services, health workers' factors, and access to healthcare factors. These are variables that were addressed in this study. Health workers may be available to deliver health services, but patients must be available for utilization in order to improve health outcomes, failure of which already allocated resources often go to waste, and under-five mortality escalates. The following figure 2.2 shows the theoretical framework of the study.

Figure 2.2

Theoretical framework



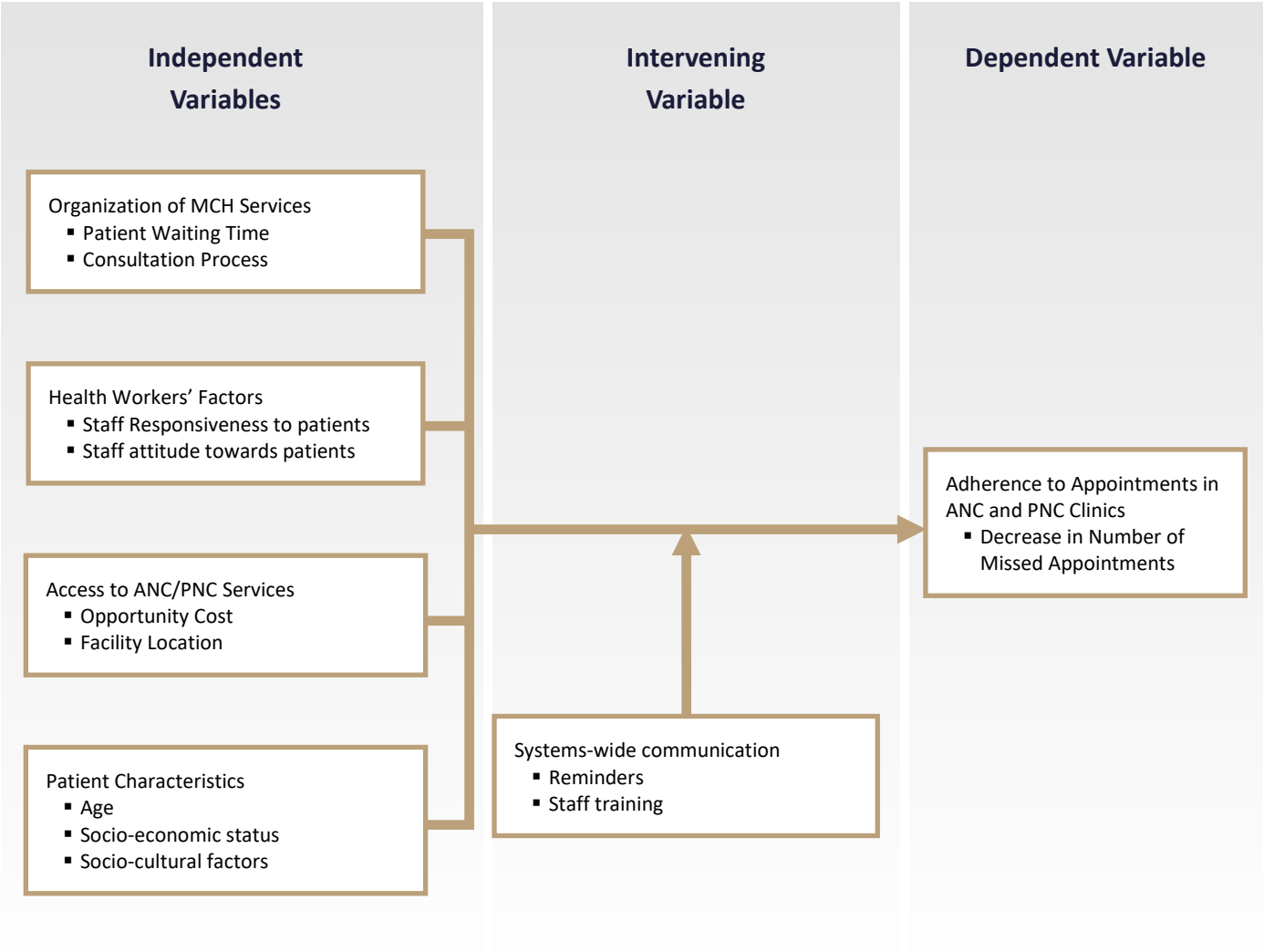
Source: As adopted from Ferlie & Shortell (2011).

2.11 Conceptual Framework

The study examined the mechanism of improving ANC and PNC clinic attendance through reducing missed appointment rates. A systems approach intervention was used as the moderating variable. The independent variables included organization of MCH services, health workers, access factors, and patient characteristics. The dependent variable was improved adherence to ANC and PNC clinic appointments measured by reduced missed appointment rate. This is shown in figure 2.3.

Figure 2.3

Conceptual framework



Source: As adopted from Ferlie & Shortell (2011).

2.12 Conclusion

In summary, reducing missed appointment rates requires resources and efforts from both patients and health workers. Implementing mobile phones as an intervention would reduce missed appointment rates, improve health outcomes, and strengthen equitable health services. As has been documented that the presence of health care services does not guarantee that they will be optimally used by patients. It is essential to note that even having adequate number of health workers would not mean anything if their attitude were not perceived as good by the patients. Also, poverty is among the top reasons why majority of people in the rural areas choose to stay in their business to fend for their families instead of seeking health services. Studies have addressed factors such as organization of MCH services, health workers, access, and patient characteristics as contributing factors to missed appointments. Similarly, different interventions such as SMS, phone call and email notifications have been cited to reduce the missed appointments that are associated with forgetfulness. In addition, different studies have cited the impact of different interventions in reducing missed appointments. For example, Kazi et al. (2018) concluded that SMS notification reminders are more effective than other forms of interventions among PNC patients in Pakistan. Hasvold and Wootton (2011) added that SMS reminders are often preferred by health care providers because of easy delivery of the intervention and lower costs of implementation compared to phone call reminders. Besides, SMS has become a common communication medium, especially with the prevalence of mobile phone ownership in the world (Deloitte, 2016). Literature has overwhelmingly supported the adoption of SMS reminder intervention to reduce missed appointments at health facilities across the globe. In a review by Guy et al. (2012) on the effectiveness of SMS reminders in increasing clinic attendance, it was reported that SMS reminders are effective in increasing adherence to appointment among outpatient clinic patients. Most studies that have been done in Africa and the west show more

application of SMS reminders in reducing missed appointments in outpatient clinics. A few studies have, nonetheless, reported minimal effect of SMS reminders.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This is the mechanism and process through which this study was conducted. It included study design, study site, target population, sampling procedure, sample size determination, data collection methods, data analysis, and data presentation.

3.2 Study Design

This was a case control study with a quasi-experimental research design. Quasi-experimental research design involves nonequivalent groups being assigned different conditions of interventions (Blair & Blair, 2015). The study implemented an intervention in one group, and none in the other group which was used as a control. For example, one group was assigned conditions of intervention, and another having no condition for purposes of control to ascertain the effect of the intervention. A quasi-experimental research design is suitable for this study because the study was conducted in two hospitals in different counties, with conditions of interventions being carried out in one hospital (Homabay County Hospital) and none in the other hospital (Kisumu County Hospital) that was used as a control in order to answer the research questions.

3.3 Study Site

The study site was Homabay and Kisumu Counties, located in the Lake Victoria region in the former Nyanza region, lies in about 3152.5 and 2085.4 square kilometers, respectively. Homabay and Kisumu counties, according to the 2019 KNBS Census, have a population coverage of 1,131950 and 1,155574 respectively. Homabay and Kisumu counties also have high under-five mortality rates of 91/1000 and 75/1000 respectively. The two counties are ranked high in HIV/AIDS prevalence of

18.9% and 12.6% respectively with poverty levels up to 50.3%. These alarming statistics informed the decision to select them as the study site. Homabay County has one county level hospital and eight sub-county hospitals. This informed the decision to focus on the county level hospital because of the large number of populations it serves. Kisumu County also has one referral hospital, one county level hospital, and fourteen sub-county hospitals. The study also selected Kisumu County hospital because of the population coverage, uniformity in services, and policy frameworks.

Therefore, a study was conducted in Homabay County hospital (280 bed-capacity) in Homabay County, and Kisumu County Hospital (195 bed-capacity) in Kisumu County. Homabay County hospital is situated within the municipality and is easily accessed by the general population. Kisumu County hospital is also located in the central Business District of Kisumu town, making it easy to reach by the population of Kisumu County residing within the municipality. These facilities share common characteristics in terms of health infrastructure, functional procedures and policy frameworks and implementation because they are ranked as county level facilities according to the ministry of health. They all offer similar ANC and PNC services to majority of the population in their geographical locations and are located in peri urban (Homabay) and urban (Kisumu City) areas respectively, all of which are in Nyanza region. The facilities also serve populations with relatively similar socioeconomic status, with majority of people falling at the bottom of economic pyramid. Nevertheless, the facilities relatively experience high missed appointment rates in Nyanza region based on hospital records. In addition, the study focused on these two facilities because of their municipality location for ease of physical accessibility.

3.4 Target Population

The study targeted two Counties (Homabay and Kisumu). These counties are located in the Nyanza region in Kenya. The two counties boarder Lake Victoria and form part of the lake basin economic block. Homabay and Kisumu also record high prevalence of HIV/AIDS of 18.9% and 12.6% respectively with poverty levels up to 50.3%, contributing to high mortality rates. These counties have alarming under-five mortality rates with Homabay recording 91/1000 while Kisumu having 75/1000. Therefore, the study targeted these counties to attempt to reduce these mortality rates by intervening in ANC and PNC clinics. Adherence to ANC and PNC appointments provides a chance of detecting infections such as HIV/AIDS at early stages, which can promote chances of preventing transmission to the unborn baby. Within these counties, there is only one county hospital each offering ANC and PNC services to the largest populations in these counties.

The study, therefore, narrowed down to two county hospitals (Homabay County and Kisumu County) because they offer similar ANC and PNC services, and serves majority of the populations within their geographical areas. Also, these county hospitals have similar policy frameworks, health infrastructure, and mechanisms of operations based on the guidelines of the ministry of health because they fall in the same health facility levels. Even though there were more ANC clients registered, the study targeted only 200 registered ANC clients and four hospital managers. Since this was an intervening study, it was vital to take up a manageable sample to follow through to the completion of the intervention for reasons of scope and confounding factors that may rise during the study. The hospital managers included maternity in-charges and hospital heads. Only consenting and registered ANC clients in their first visit with scheduled appointments were included. This was because of the need to enrol those in their first trimester and those who may be in consecutive

semesters but were visiting for the first time. Nonetheless, the study intervened on the sample through to first month after delivery, and this took up to seven months before the end-line survey was conducted. The study took seven months because the ANC client at the earliest stage was at three months of pregnancy. The seven months enabled the researcher to follow the ANC clients from first registration up to one month after delivery. Also, for PNC, the first one month is critical for the survival of the baby in terms of the scheduled vaccines. Missing appointments at this stage lead to the wastage of vaccines and high under-five mortality rates (Nyakundi *et al.*, (2015). The following table 3.1 shows how the target population was distributed in each hospital.

Table 3.1

Distribution of Targeted Population per Hospital

	Patients (N)	**Hospital Head (n)**	**Maternity In-charge (n)**
Homabay County Hospital	104	1	1
Kisumu County Hospital	96	1	1
Total Population	**200**	**2**	**2**

Source: Facility Records as of September 2020

3.5 Study Sample

The study sampled 133 ANC clients (Homabay County Hospital 70, Kisumu County Hospital 63) through random and stratified sampling, and four hospital managers, two from each facility (hospital head, and maternity in-charge) were sampled purposely. The sample provided sufficient information to answer the research questions. 133 ANC clients also fitted the scope of the study and enabled effective follow up throughout the intervention period. Including a bigger sample would have meant wider scope, and it may not have been feasible to follow through with a bigger sample to the

conclusion of the study. The study sampled four hospital managers, including two hospital heads and two maternity in-charges because there was only one hospital head and one maternity in-charge in each hospital. The inclusion criteria included consenting and registered ANC clients in their first visit with scheduled appointments. This allowed for follow up to one month after delivery. Exclusion criteria included non-consenting, unregistered ANC clients, those who are visiting for the second time and above, and those who did not turn up for their final appointments. This is because after the first visit, there could be other confounding factors that may contribute to appointment adherence, and therefore the effect of the intervention may not be conclusively realized.

3.5.1 Sample Size Determination

To determine the clients sample size, the study used Yamane's Simplified Sample Formula for proportions which is suitable for small population and reducing the sample size slightly as revised by Blair and Blair (2015). The total target population was 200 clients in two hospitals.

$n=N/ (1+N (e^2))$

Where;

n is the sample size.

N is the population size.

e is the margin of error.

$n_1 = 200/ (1 + 200(0.05)^2)$

$n_1 = 133.30$. Thus, $n_1 = 133$

The following table 3.2 shows how the sampled population was stratified and proportionally distributed between the two sampled hospitals.

Table 3.2

Distribution of Sample per Hospital

	Patients (N)	**Sampled**	**Hospital Head (n)**	**Maternity In-charge (n)**
Homabay County Hospital	104	70	1	1
Kisumu County Hospital	96	63	1	1
Total Population	**200**	**133**	**2**	**2**

To determine the health workers sample, purposive sampling was used where the head of the facility and the in-charge in the maternity department were included in the study. We use purposive sampling when looking for a population that fits a particular profile, and in this case the hospital heads. Therefore, the total was four health workers, two in Homabay county hospital and 2 in Kisumu County hospital.

3.6 Sampling Procedure

Purposive sampling method was used to sample hospitals and for intervention implementation. Purposive sampling is used when a researcher needs a sample that fits a particular profile. The study sort to focus on hospitals with similar profile. The hospitals were purposely sampled because they had a common profile of county level category in the respective counties, similar profile of the population they serve, geographical municipality location, and the need to cover peri-urban and urban areas. Therefore, the study purposely focused on Homabay County Hospital and Kisumu County Hospital, all which are situated in peri-urban and urban areas respectively. Purposive sampling method was also used to determine the hospital where the intervention was implemented and that which was used as the control. This was based on the rate of missed appointments. Based on the baseline results in chapter four, the intervention was implemented in the Homabay County hospital

(hereof referred to as the intervention group) which had the highest number of missed appointments and high population coverage. Kisumu County hospital (hereof referred to as the control group) which had fewer missed appointments was used as a control.

Random and stratified sampling method was used to sample ANC clients. Stratified random sampling is a method used when dividing a population into smaller sub-groups referred to as strata. This was done to divide the sample between the two hospitals. ANC clients were randomly recruited for baseline study in both Homabay County hospital and Kisumu County hospital. This infers that ANC clients who turned up in each hospital for an ANC visit was recruited, and the recruitment was done for up to one month until the sample was attained. Upon recruiting the targeted sample per hospital, stratified sampling method was used for the clients based on the population of different hospitals in order to have a sample population that was representative of all the hospitals. The sample size (133) was divided proportionately by percentage of the total population (200). That is, the total population per hospital (Homabay 104, Kisumu 96) over the general population (200) multiplied by the determined sample size (133). This gave the sample size per hospital (Homabay 70, Kisumu 63) that was used in the study. This sampling method ensured that the hospitals are represented proportionately in the final determined sample size.

Purposive sampling was used to sample hospital managers because there were only two, and therefore, where the head of the facility and the in-charge in the maternity department were included in the study. That is, two in Homabay County hospital and two in Kisumu County hospital. These managers were used as the key informants.

3.7 Data Collection Instruments

The study used self-administered structured questionnaire to collect data from ANC and PNC clients during both the baseline and end line data collection. The structured questionnaire, appendix ii, included a set of closed ended questions that required the clients to select the suggested answers for ease of coding. The rationale of using a self-administered structured questionnaire is because it is less expensive than interviewing a vast number of people; it is quick and efficient way to obtain information from a large number of individuals; and it secures the anonymity of the participants (Blair & Blair, 2015). The study also used one key informant interviews (KII) guide for hospital heads and maternity in-charges at baseline and end line in order to compare the difference at the end of the intervention. The KII, appendix iii, included a set of open-ended questions which allowed for in-depth description and responses to the research questions for purposes of triangulations to establish the need for and effect of the intervention on adherence to appointments in ANC and PNC clinics, and the outcome of the same.

3.8 Pre-testing of Tools

There was a pretest of the research instruments conducted in Migori County hospital as a means of previewing the likelihood of successful study. Migori County hospital shares common characteristics with the actual study sites in terms of services offered, facility level and policy framework, health infrastructure, population coverage, socioeconomic status of the served population, and experiencing missed appointments in ANC and PNC clinics. This facility was used for pre-test because of these shared characteristics. The pre-test was conducted among 15 (10% of the sample size) ANC and PNC patients (picked randomly) within the hospital at exit point to ensure the research tools could perform

the intended purpose before the actual study commenced. Based on the result of the pretest study, the investigator redrafted the questionnaire to ensure the right data was collected in the actual study.

3.8.1 Validity

Validity refers to appropriateness or fitness of the processes, tools, and data. In order to determine whether the research tools are valid for the outcome that is desired, the choice of methodology must be appropriate to answer the research question. Validity indicates that the instruments measure what it is designed to measure (Blair & Blair, 2015). In assuring internal validity, the researcher described appropriate strategies such as member checks, reflexivity, prolonged contact, saturation, triangulation and peer review. External validity can be assured by exploring appropriate strategies like variation in participant selection and thick description. The researcher, therefore, checked for both content and construct validity of the instrument before the study commenced. In order to ensure the questionnaires were valid, accuracy was tested during the pre-test among the respondents sampled randomly in the hospital. This was done by giving the questionnaires to the sampled patients; questions read out to them to check if they understood the questions if responses were accurate and matched the intended purpose. In cases where there were any inconsistencies, the investigator restructured, rewrote the questions, as per literature review, based on the way the respondents understood them, in order to get accurate responses during the actual study.

3.8.2 Reliability

Reliability is the replicability of the exact process and results. The essence of reliability lies with consistency. In order to ensure using the same questionnaire produced the same results, the reliability was measured. Reliability is the degree to which a research tool gives consistent results when repeated

on separate occasions (Blair & Blair, 2015). To assure reliability, the researcher audited triangulations for consistency. The researcher also used reflexivity to establish reliability. For example, responses were read out to the respondents to allow them review the interview responses (member checking) and verify the accuracy of their responses. When response uniformity, participants' answers, and method triangulation are verified, they provided a construct to test the reliability of the instrument that is related to interview questions. Accuracy of the responses and research instrument were corroborated by the similarity in responses among the participants throughout the interview. Therefore, a continuous member-checking loop was part of reliability process for the qualitative data. Reliability of the questionnaires for quantitative data was measured by giving the same questionnaires to the same respondents on two separate occasions. Based on Cronbach's alpha test of reliability, a reliability coefficient of 0.8 was set to ensure good reliability. The responses on two separate occasions were correlated, and a reliability coefficient 0.75 was obtained, which is acceptable reliability coefficient as it was above the recommended coefficient of 0.7 (Blair & Blair, 2015).

3.9 Data Collection Methods

The study employed both qualitative and quantitative methods of study during data collection, particularly structured questionnaires among ANC and PNC clients. A self-administered structured questionnaire was used among the sample to collect data for baseline and end-line survey. Clients were approached at the exit point for data collection and asked to willingly participate in the study. The informed consent was read out to them in a language they understood and asked to sign if ready and willing to participate. After signing the consent form, the clients were asked to participate in the baseline survey by answering the questions in the structured questionnaire, which was self-administered at this point. Since the hospitals have two ANC and PNC clinics per week, the process

of baseline data collection was done twice a week until the sample was attained. This took up to one month. The clients who did not turn up for their appointments were excluded. The facility heads and the maternity in-charges were also involved in the baseline study to ascertain the status quo through the use of KII. Upon completion of baseline data collection, an analysis of the baseline data was done according to the procedure stated in the data analysis section.

A health systems approach intervention was then proposed and initiated for up to seven months as stated in the proposed intervention section below. The baseline sample in Homabay County hospital (intervention group) was followed up appointment after another. Their adherence to appointments was monitored until the end of the intervention period. The end-line data collection was done during the last appointment of each sampled client within the seven months of the intervention. Data was also collected for the second time from control group (Kisumu County hospital) in their last appointment. The last appointment of each client was considered within 30 days after delivery. This is because most neonatal deaths occur within 28 days after birth. Those who fall out during the intervention or before their last appointment were not included. The point of questionnaire administration was at the exit point after receipt of services. This was because of the need to collect data on the experience during receipt of services. End-line data collection was done during the last appointments within the seven months of intervention. The rationale for choosing seven months was because most ANC appointments are scheduled on monthly basis, and seven months provided a chance to follow up the ANC clients from first registration to up to one month after delivery to establish the effect of the intervention. Seven months was also enough time because most ANC clients had their first visit at three months of their pregnancy. Key Informant Interview Guide was used among the two hospital managers (hospital head and maternity in-charge) per hospital. The Key

Informant Interview Guide was administered at the end of the seven months intervention period. This was because of the need to collect data on the effect of the intervention on adherence to appointments in ANC and PNC clinics. The point of KII administration was at the respective offices of the managers.

3.10 The Intervention

The study proposed a health system approach intervention on health system factors inform of a system-wide communication, which was done through reminders and staff training to reduce missed appointments. This is because the missed appointments were due to both facility factors and patient factors based on the baseline results. Even though the baseline study determined that all the factors (organization of MCH services, health workers factors, issues of access and patient characteristics) directly influence adherence to appointments in ANC clinics. The intervention point was limited to organization of MCH services, health workers, and ANC clients only. This is because of the inability of the study to influence certain patient characteristics and access factors such as facility proximity and opportunity cost of seeking care. Based on the baseline results, Homabay County hospital had high missed appointment rate 59 (84.3%) compared to Kisumu County hospital 38 (63%) and, therefore, the intervention was done in Homabay County hospital. Before we began the intervention, all elements of the intervention including the procedure were discussed with the facility head, who granted the permission to proceed. The intervention was done for seven months, from September 2020 to March 2021 with the help of two medical interns recruited with the help of the facility.

The intervention involved a system wide communication, which included sending appointment reminders through phone text messages and phone calls to ANC clients, and training staff on client

best practices and public relations initiatives to encourage clients to honor appointments. The intervention was implemented on ANC clients, health workers and certain facility procedures including clinic operating hours, consultation process, and routine cleaning.

Reminders to 70 ANC clients were communicated through phone calls, followed by a text message twice (one week before the appointment and one day to the appointment). This was done during morning hours between 9am and 12pm by the receptionist at the MCH clinic. The communication involved educational messages on the importance of ANC services and a reminder to attend the appointment on the scheduled day. These were customized messages based on the pregnancy trimester for each client. Even though phone calls and messages varied from client to client because of the need to sometimes speak in the local dialect or Kiswahili, a typical message was as follows:

"*Dear (Client's first name), this is a reminder from Homabay County Hospital about your ANC appointment on (Date) at (Start time) for (Services to be received and their benefits). Attending your appointment improves the health and boosts immunity of your unborn child, as well as help us detect problems that may obstruct safe delivery at an early stage.*

Reminders to the health workers in MCH clinic was done in form of training, and follow ups done through phone calls to the maternity in-charge. The communication involved public relations initiatives which included staff training on customer care best practices. Banners indicating customer care practices were printed to act as constant reminders for the staff. Training also included the importance of good attitude and responsiveness to the needs of the customers. Staff were requested to model and customize services based on clients' needs and listen more to their concerns. The staff

was also trained to foster good relationships with the clients, including addressing them with their names, appreciating them for honoring appointments, and listening more to their needs without dismissing them. The training of health workers took place ones per month for up to thirty minutes in the new conference room beginning at 4pm, strictly adhering to the facility coronavirus measures. Every staff member was required to wear a face mask and sit at least 1.5 meters apart. Ventilation within the conference room was also adequate. Follow ups were done on weekly basis through phone calls to the maternity in-charge to determine whether the staff were adhering to the training and to record any visible outcomes. Even though the intervention required seven training sessions, the total number of trainings done until completion were six. This was due to the changing coronavirus dynamics in the country when President Uhuru Kenyatta announced more strict measures on March 25, 2021. We agreed to share the training notes in form of text messages with the staff members. The intervention was intended to take up to seven months because the recruited ANC clients were in at least the third month of their pregnancy at the inception of the intervention.

After deliberation with the facility head, we agreed to make changes on facility procedures for the intervention purposes. Even though the facility runs ANC clinics from 8 am to 1pm twice a week, the intervention saw the extension of the operating hours extended by three hours, from 8am to 4pm during the intervention. The facility head also agreed to the proposal to provide for additional consultation point, and an enclosed tent was pitched beside the ANC consultation area. This was aimed at lessening the waiting time and serving more clients. The support staff was also sensitized about cleanliness of the facility, which saw the cleaning done three times a day, in the morning before operations, midday, and in the evening. Note: The three times a day cleaning was limited to MCH clinic only. This was an adjustment of cleaning which is often done ones in the morning. The facility

head also agreed to support the intervention with the consistent provision of tissue rolls in the MCH clinic washrooms, which was not monitored before the intervention.

The implementation of the intervention, which continued until the last appointment of the last sampled ANC client when the end-line survey was done, was conducted with the help of two trained interns recruited with the help of the management of the hospital at a fee catered for by the study. This is because of the limited number of staff in the facility. The results of the intervention are presented in the findings chapter.

3.11 Ethical Considerations

Ethical issues such as consent of the population and access to information within the hospitals were considered. Prior to the commencement of the study, permission was first obtained from the Kenya Methodist University's Scientific Research and Ethics Committee (SREC) (appendix ii), the National Commission for Science, Technology and Innovation (NACOSTI) (appendix iii), and County health offices (appendix iv). Informed consent (appendix i) was also requested from all the respondents before the study commenced. This enabled permissible access to all information that was necessary for the research. The data collected was also stored safely during coding and destroyed upon completion of analysis to safeguard privacy and confidentiality of the respondents.

3.12 Data Analysis and Presentation

Upon the completion of data collection, the data from structured questionnaires was cleaned to remove incomplete ones for coding in readiness for analysis. The data from the two hospitals were coded separately based on the responses to fit the variations acceptable in the SPSS statistical tool, which was used for analysis of quantitative data. The coding was done separately to determine the findings of each hospital both at baseline and after the intervention. This was done because of the need to compare the results after the intervention because the intervention was done in only one hospital, and the other used as a control. Therefore, there was a need to know the effect of the intervention in the intervening facility.

During both the baseline and end line data analysis, descriptive statistics were generated and used to describe the status of both the independent and dependent variable. This was done for all the variables under each objective. During the analysis, cross tabulations of the variables were run to compare the outcome. This was done for all the variables under each objective after which findings were reported. For inferential statistics, binary logistic regression was run to inform the influence of the independent variables under each objective on the dependent variable. This was repeated for all the objectives. The functional formula set was as follows:

$$P(Y_i) = \frac{1}{1 + e^{-(b_0 + b_1 X_{1i})}}$$

where

- $P(Y_i)$ is the predicted probability that Y is true for case i;
- e is a mathematical constant of roughly 2.72;
- b_0 is a constant estimated from the data;
- b_1 is a b-coefficient estimated from the data;
- X_i is the observed score on variable X for case i.

A multivariate logistic regression was then run to make inferences on all the independent variables together on the dependent variable. The functional formula set as follows:

$$P(Y_i) = \frac{1}{1 + e^{-(b_0 + b_1 X_{1i} + b_2 X_{2i} + \ldots + b_k X_{ki})}}$$

where

- $P(Y_i)$ is the predicted probability that Y is true for case i;
- e is a mathematical constant of roughly 2.72;
- b_0 is a constant estimated from the data;
- $b_1, b_2, \ldots, b_k$ are the b-coefficient for predictors 1, 2, ... ,k;
- $X_{1i}, X_{2i}, \ldots, X_{ki}$ are observed scores on predictors $X_1, X_2, \ldots, X_k$ for case i.

For both binary and multivariate logistic regressions, odds ratios were determined and used to make conclusions on the influence of each independent variable on the dependent variable. Due to the need to determine relationships between the study variables, a p value was set at $p < 0.05$. A Pearson Chi-square test was run for each variable to determine associations and statistical significance as well as

the extent to which the independent variables influence the dependent variable. The p values obtained were then used to generate conclusions to answer the research questions.

The qualitative data was transcribed from the notes taken from the responses of the hospital heads and maternity in-charges from KII. A narrative analysis was done where excerpts were reviewed and explored out of which they were presented cohesively to justify the findings. Presentation of data was done through the use of tables accompanied by narrative illustrations and explanations of the findings. Throughout the findings, Homabay County hospital is referred to as the intervention group while Kisumu County hospital is referred to as the control group.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This section presents the findings of the study and the discussions. The baseline and end line findings are presented together in the order of the research objectives. Findings from the qualitative data are presented after those from quantitative data. The end line findings were reached after implementing a health systems approach intervention for seven months. While the baseline study determined that all the factors (organization of MCH services, health workers factors, issues of access and patient characteristics) directly influence adherence to appointments in ANC clinics. The intervention point was limited to organization of MCH services, health workers, and ANC clients only. This is because of the inability of the study to influence patient characteristics and access factors such as facility proximity and opportunity cost of seeking care.

This was a case control study with a quasi-experimental research design. It had a control group (Kisumu County hospital) and an intervention group (Homabay County hospital). The intervention group was purposely sampled because of the high missed appointment rate in the facility, which inferred low adherence to ANC appointments based on *"Did Not Attend"* facility records. To collect the baseline data, the recruitment of ANC clients was done for up to one month until the sample, 133 (70 in Homabay County hospital and 63 in Kisumu County hospital) were attained. Also, the respondents were limited to only consenting clients and those who had subsequent scheduled appointments. The collection of baseline data took up to one month, after which the respondents in the intervention group (Homabay County hospital) were followed for up to seven months, up to one month after delivery, after which the end line data was collected. The control group was not followed, and end line data collected from them for the second time after seven months.

The intervention in the intervention group (Homabay County hospital) involved a system wide communication which was implemented in form of reminders via mobile phones on ANC clients, health workers and certain facility procedures including clinic operating hours, consultation process, and routine cleaning. The intervention took up to seven months because the recruited ANC clients were in at least the third month of their pregnancy at the inception of the intervention. The intervention included reminders communicated twice to ANC clients through phone calls and text messages about their upcoming appointments and the relevance of the services to be received during the appointments. Healthcare workers were also reminded about their contribution to appointment adherence through trainings and follow-up phone calls. The management agreed to the changes on aspects of facility procedures as mentioned under the intervention section. Homabay County hospital and Kisumu County hospital are referred to as the Intervention group and the Control group respectively in the document.

4.2 Response Rate

The baseline study had a 97.5% response rate based on the sample for ANC clients (130 out of 133), 70 in Intervention group and 60 in Control group. The end line survey had a 97.2% response rate based on the sample for ANC clients (126 out of 130), 66 in Intervention group and 60 in Control group as shown in table 4.1.

Table 4.1

Response Rate

Hospital	Baseline			End line		
	Sampled	Responded		Sampled	Responded	
		N	%		N	%
Intervention group	70	70	100	70	66	94.3
Control group	63	60	95	60	60	100
Total	133	130	97.5	130	126	97.2

The reliability and validity of the findings were ensured as indicated in chapter three above. The Cronbach's Alpha levels of all the variables were all above 0.7 indicating a reliable internal consistency. The following table 4.2 shows the Cronbach's alpha output from the reliability test.

Table 4.2

Reliability statistics

Variable	N or Items	Cronbach's Alpha
Organization of MCH services	15	.753
Contribution of health workers	19	.741
Access factors	12	.770
Patient characteristics	14	.701

4.3 Demographic Characteristics of Respondents

The study categorized ANC clients into different age cluster. Majority, 25 (35.7%) and 20 (33.3%) of the ANC clients in Intervention group and Control group respectively were between the age of 28 and 32. The minority, 10 (14.3%) and 10 (20%) in Intervention group and Control group respectively were between the age of 23 and 27. The rest of the sample were distributed among other age clusters as shown in table 4.3.

In terms of socioeconomic status, the study majority, 35 (50%) and 27 (45%) in Intervention group and Control group respectively were married, while 15 (21.4%) and 13 (21.7%) in Intervention group and Control group respectively were single. The study also revealed that majority 40 (57.1%) of ANC clients in Intervention group are not employed, while majority 34 (56.7%) of ANC clients in Control group are employed. Even though there are those that are employed as stated above, income level is low in both the county hospitals. When asked about their income level, majority 35 (50%) of ANC clients in Intervention group reported an income range of Ksh10000 to Ksh19999,

with only 5 (7.1%) earning between Ksh30000 to Ksh39999. In Control group, majority 15 (25%) reported that they earn below ten thousand Kenya shillings, while only 5 (8.3%) reporting that they earn forty thousand Kenya shillings and above. Table 4.3 shows a summary the respondents' demographic characteristic.

Table 4.3

Demographic characteristics of respondents

Variables	**Name of Hospital**			
	Intervention group		**Control group**	
	N	**%**	**N**	**%**
Age of respondents				
18-22	20	28.6	10	16.7
23-27	10	14.3	10	16.7
28-32	25	35.7	20	33.3
33-37	15	21.4	20	33.3
Marital status				
Single	15	21.4	13	21.7
Married	35	50	27	45
Widow	5	7.1	10	16.7
Separated	10	14.3	6	10
Cohabiting	5	7.1	4	6.6
Employment status				
Yes	30	42.9	34	56.7
No	40	57.1	26	43.3
Income level				
0-9999	20	28.6	15	25
10000-19999	35	50	10	16.7
20000-29999	10	14.3	15	25
30000-39999	5	7.1	15	25
40000 and above	0	0	5	8.3

4.4 Test of Normality

The study sort to do normality test to establish if the data is normally distributed or if any assumptions are violated. Due to the small data set included in the study, Shapiro-Wilk test was adopted which the study considered as more reliable to test the normality of the data collected to establish if the

distribution deviates from a bell-shaped normal distribution. The test was done for each of the five variables and p values identified for interpretation. The test results showed that the three variables had p values less than 0.05. Two variables had p values of greater than 0.05, from which the study concluded that the sets of data for the three variables were not normally distributed (free-distribution), while the other two were normally distributed. Based on this finding adopted a mix of parametric and non-parametric analysis, whereby logistic regression was embraced. Table 4.4 shows these results.

Table 4.4

Test for Normality

	Shapiro-Wilk		
	Statistic	df	Sig.
Y	.051	215	.200*
X1	.041	215	.200*
X2	.047	215	.000*
X3	.043	215	.000*
X4	.052	215	.200*

Where;

Y is Dependent variable (Adherence to appointments)

X1 is Independent variable (Organization factors)

X2 is Independent variable (Health workers factors)

X3 is Independent variable (Access factors)

X4 is Independent variable (Patient factors)

Based on the independent variable indicators, the data was categorized into two categories (yes/no) and four Linkert scale (four categories), making up categorical data. In order to measure the variables, categorical data was used which ranged from (1= yes and 2= no) and the four Linkert scale which ranged from (very satisfied, satisfied, dissatisfied and very dissatisfied) were combined into (1= very satisfied and satisfied and 2= dissatisfied and very dissatisfied) for purposes of running inferential

analysis. Guided by this category, descriptive statistics, cross tabulations were run to describe the status of both the independent and dependent variable. For inferential statistics, logistic regression was then run to predict the relationship between independent variables and dependent variable. Pearson Chi-square test was also run to determine the association and significant levels between the variables. The findings are presented in the following sections.

4.5 Adherence to Appointments

Adherence to appointments in this study is measured by the number of missed appointments. A high rate of or increase in adherence means low rate or decrease in number of missed appointments. Prior to the study, facility records in 2019 showed that adherence to appointments in ANC clinics in Homabay was 42% and that in Kisumu was 35% according to the 2019 Hospital Did Not Attend Reports. The baseline findings showed a higher missed appointment rate. The findings revealed that 59 (84.3%) of ANC clients had missed appointments within the last six months in Homabay county. For Kisumu Counties, and 38 (63%) of ANC clients had missed appointments. Even though most of these missed appointments were associated with the study variables as indicated in the results below, it is important to note that the coronavirus pandemic may have contributed to the high percentage, particularly because many people were shying away from hospitals during the baseline study. A health systems approach intervention was done in in Homabay County hospital (Intervention group) for seven months and none in Kisumu County hospital (Control group). After seven months of intervention, missed appointments declined to 10 (15%) in Intervention group where the intervention was done. In the control group, the missed appointment was at 35 (58%) after seven months.

Table 4.5

Adherence to ANC appointments

Variables	Baseline				End line			
	Name of Hospital				Name of Hospital			
	Intervention		Control		Intervention		Control	
	N	%	N	%	N	%	N	%
Adherence								
Missed Appointment rate	59	84.3	38	63.0	10	15.0	35	58.0

The above findings are in concurrence with those of Perron *et al.* (2013) who asserted that phone reminders are effective in reducing missed appointment rates. A study done in Kenya by Dustin *et al.* (2017) to improve immunization also reported that SMS reminders help individuals who support to remember an appointment and adhere to it. Hardy (2017) also reported that when staff trainings are key in communication and addressing customer needs, and that customers are likely to seek more services where they feel staff understand their needs. Ward et al. (2017) also argues that the manner in which staff communicates with the customer is likely to affect their relationship which in turn affects service uptake.

4.6 The influence of organization of MCH services on adherence to appointments in antenatal clinics

The results obtained from individual indicators used to measure organization of MCH services are presented under this section.

4.6.1 Patient Waiting Time

At baseline, the study findings revealed that patient waiting time in both Intervention group and Control group were a concern to the ANC clients. When ANC clients in the Intervention group were asked how long they waited to see the health care provider, majority 26 (37.1%) waited for 60 or

more minutes, while 20 (28.6%) waited for at least 30 minutes to see a health care provider during an appointment. In the Control group, majority of ANC clients 25 (41.6%) waited for 60 or more minutes, while 15 (25%) waited for at least 30 minutes. Due to this amount of waiting time, majority of ANC clients in Intervention group, 35 (50%) were very dissatisfied with the waiting time, 25 (35.7%) were dissatisfied, while only 10 (14.3%) saying they are satisfied with the waiting time. This is not different in Control group where majority, 25 (41.6%) were very dissatisfied, 21 (35%) were dissatisfied, and only 14 (23.4%) saying they were satisfied with the waiting time.

After seven months of the intervention, the end line results revealed that patient waiting time can be improved by increasing the number of consultation points. After the intervention, patient waiting time in the Intervention group was significantly reduced. For example, only 26 (39.4%) waited up to 45 minutes to receive care, while majority 40 (60.6%) waited for up to 30 minutes, which is the recommended waiting time. In the Control group, majority of ANC clients 44 (73.3%) waited for more than 30 minutes, while only 16 (26.7%) waited for up to 30 minutes to receive care. Majority of ANC clients in the Intervention group, 38 (57.6%) reported that they were satisfied with the waiting time, and only 28 (42.4%) said they were still dissatisfied with this waiting time. In the Control group where no intervention was done, majority, 18 (30%) and 20 (33.3%) remained very dissatisfied and dissatisfied with waiting time, respectively. Only 22 (36.7%) said they were satisfied with the waiting time. The intervention had also reduced missed appointments associated with patient waiting time significantly to only 6 (9.1%) in the Intervention group. Even though the findings in Control group have slightly changed, majority of ANC clients still wait for more than 30 minutes to receive care and are still dissatisfied with the amount of waiting time. Missed appointments due to waiting time is also still high at 33 (55.0%). The findings show that ANC clients

in both Intervention group and Control group wait at least 30 minutes before receiving care, and that majority of them are dissatisfied with the amount of time they have to wait to see a health care provider. In addition, majority of ANC clients 55 (78.6%) and 40 (66.6%) in Intervention group and Control group, respectively, have missed their ANC appointments at some point because of the waiting time. Table 4.6 shows a summary of patient waiting time, patient satisfaction with the waiting time, and missed appointment due to waiting time before the intervention in Intervention County and Control County and after the intervention in Intervention County.

Table 4.6

Patient Waiting Time

Variables	Baseline					End line			
	Name of Hospital					Name of Hospital			
	Intervention		Control			Intervention		Control	
	N	%	N	%		N	%	N	%
Patient waiting time									
≤44 minutes	20	28.6	15	25.0	≤ 44 minutes	40	60.6	16	26.7
45-59 minutes	24	34.3	20	33.4	45-59 minutes	26	34.3	20	33.3
≥ 60 minutes	26	37.1	25	41.6	≥ 60 minutes	0	0	24	40.0
Satisfaction with patient waiting time									
Satisfied	10	14.3	14	23.4	Satisfied	38	57.6	18	30.0
Dissatisfied	25	35.7	21	35.0	Dissatisfied	28	42.4	20	33.3
Very dissatisfied	35	50.0	25	41.6	Very dissatisfied	0	0	22	36.7
Missed Appointment due to waiting time									
Yes	55	78.6	40	66.7	Yes	6	9.1	33	55.0
No	15	21.4	20	33.3	No	60	90.9	27	45.0

A cross tabulation done between the patient waiting time and missed appointment due to the waiting time shows a direct relationship indicating that the longer the patients waited to receive care, the higher the chance of missing appointment. For example, in the Intervention group out of 26 (100%) ANC clients who waited for 60 or more minutes to receive care 25 (96%) have missed

their ANC appointments due to the long waiting time. In the Control group, all 25 (100%) ANC clients who waited for 60 or more minutes to receive care said they have missed their ANC appointment due to the waiting time. Descriptively, it is notable that in Control County, all the 15 (100%) ANC who waited for up to 44 minutes to receive care have never missed their ANC appointment due to the waiting time. This shows that the long waiting time is a deterrent to adherence to ANC appointments. The following table 4.7 shows a summary of the relationship between waiting time and missed appointment.

Table 4.7

Patient waiting time and missed appointment crosstabulation.

Patient waiting time	**Missed appointment due to waiting time**											
	Intervention group						**Control group**					
	Yes		**No**		**Total**		**Yes**		**No**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
<44 minutes	15	21.4	5	7.1	20	28.6	0	0	15	25	15	25
45-59 minutes	15	21.4	9	12.9	24	34.3	20	33.3	0	0	20	33.3
≥ 60 minutes	25	35.8	1	1.4	26	37.1	25	41.7	0	0	25	41.7
Total	**55**	**78.6**	**15**	**21.4**	**70**	**100**	**45**	**75**	**15**	**25**	**60**	**100**

The findings above are similar to those of Einstein (2012) who reported that long waiting time discourages patients from seeking care, resulting in high missed appointment rates. According to Einstein (2012), people in the rural setting often experience waiting time as a barrier to healthcare limiting their ability to get the care they need. The findings also concur with those of WHO (2013) which asserted that while availability of services may be a non-issue, especially for ANC and PNC clinics, patient waiting time can be a deterrent to delivery and utilization of the services. These findings concur with the study findings as shown above. Therefore, in order to increase adherence

to appointments for ANC services, there is a need for a system intervention that would reduce or limit patient waiting time.

4.6.2 Consultation Process

Before the intervention, consultation process was measured in terms of privacy during consultation, duration of consultation, operating hours, general cleanliness, and satisfaction with quality of services received. 70 (100%) ANC clients in Intervention group reported that all consultation rooms were labeled based on the services provided inside. 60 (100%) in Control group also reported that all consultation rooms were labeled based on the services provided inside. Majority 45 (64.3%) in the intervention group were dissatisfied with the privacy during consultation, and 32 (53.3%) in the Control group were also dissatisfied with the privacy during consultation. In addition, 40 (57%) were not satisfied with the consultation duration in Intervention group, and 28 (46.7%) in the Control group were also not satisfied with the consultation duration. The ANC clients were asked about their general satisfaction with the consultation process, and majority 40 (57.1%) in the intervention group were dissatisfied, and 33 (55%) in the control group also reported that they were dissatisfied.

After the intervention in the Intervention County, the end line findings demonstrated that the intervention had a significant influence on consultation process in Intervention group in terms of privacy during consultation, duration of consultation, operating hours, general cleanliness, and satisfaction with quality of services received. In the Intervention group, majority 40 (60.6%) of the ANC clients reported that they were satisfied with the privacy during consultation, 44 (66.7%) ANC clients reported that they were satisfied with the consultation duration, and 43 (65.2%) of the ANC clients

reported that they were satisfied with the consultation process. On the contrary, there were no significant changes in Control group seven months after the baseline study. The following table 4.8 shows a summary of the findings before the intervention in Intervention County and Control County and after the intervention in Intervention County.

Table 4.8

Consultation Process

Variables	Baseline					End line			
	Name of Hospital					Name of Hospital			
	Intervention		Control			Intervention		Control	
	N	%	N	%		N	%	N	%
Satisfaction with consultation privacy									
Satisfied	15	21.4	28	46.7	Satisfied	40	60.6	22	36.7
Dissatisfied	45	64.3	32	53.3	Dissatisfied	20	30.3	20	33.3
Very dissatisfied	10	14.3	0	0	Very dissatisfied	6	9.1	18	30.0
Satisfaction with consultation duration									
Satisfied	30	42.9	24	48	Satisfied	44	66.7	27	45.0
Dissatisfied	40	57.1	26	52	Dissatisfied	22	33.3	33	55.0
Satisfaction with consultation process									
Satisfied	30	42.9	27	45	Satisfied	43	65.2	25	41.7
Dissatisfied	40	57.1	33	55	Dissatisfied	23	34.8	35	58.3
Missed appointment due to consultation process									
Yes	50	71.4	37	61.7	Yes	10	15	46	76.6
No	20	28.6	23	38.3	No	56	85	14	23.3

Before the intervention, cleanliness in the facilities has also been a concern based on the findings of the study. Majority of ANC clients, 55 (78.6%) in the Intervention group were dissatisfied with the general cleanliness of the facility, including toilets. 32 (53.3%) in the Control group were also dissatisfied with the general cleanliness of the facility. Only 15 (21.4%) in Intervention group were satisfied with facility cleanliness. In the Control group, 28 (46.7%) ANC clients were satisfied with facility cleanliness. Due to the high level of dissatisfaction with cleanliness in both facilities,

majority 55 (78.6%) in the intervention group reported that they had missed their ANC appointments before due to their dissatisfaction with the level of cleanliness in the facility. 34 (56.7%) ANC clients in the Control group reported that they had missed their ANC appointments before due to their dissatisfaction with the level of cleanliness in the facility. Only 15 (21.4%) in Intervention group had not missed their appointments due to cleanliness. However, in Control group, 26 (43.3%) had not missed their appointments. When asked how they would rate the quality of services they receive from the hospitals in terms of excellent, good, fair and poor, majority 30 (42.9%) ANC clients rated the services as of poor quality and only 15 (21.4%) rated the services of good quality in Intervention group. However, the rating was better in Control group since majority 26 (43.3%) ANC clients rated the services of good quality, with only 15 (25%) rating the services of poor quality. With this kind of rating, 30 (42%) ANC clients in Intervention group reported being very dissatisfied with the services received, with only 15 (21.4%) confirming their satisfaction. In Control group, however, 35 (58.3%) ANC clients were dissatisfied with the services they received, and 25 (41.7%) ANC clients were satisfied with the services they received.

After the intervention in Intervention County, the satisfaction level with general cleanliness improved significantly in Intervention group based on the end line findings. Majority of ANC clients, 50 (75.8%) reported that they were satisfied with the cleanliness of the facility, especially the toilets. In Control group, however, majority 36 (60.0%) are still dissatisfied with the general cleanliness of the facility. No one reported missing any appointments due to dissatisfaction with the general cleanliness in Intervention group after the intervention. However, about 28 (46.7%) of ANC clients in Control group still reported missing appointments at some point due to their dissatisfaction with the general cleanliness of the facility. The quality of services also improved

in Intervention group after the intervention. Majority 50 (75.8%) of ANC clients said the quality of services are good and are satisfied with the same. However, 13 (19.7%) still reported that they have missed appointments before due to poor quality of services. There were no significant changes in Control group where the intervention was not done. The intervention saw an increase in the number of operating hours by three hours, which led to a significant improvement in satisfaction levels of ANC clients in Intervention group. For example, 47 (71.2%) were satisfied with operating hours of the ANC clinic after the intervention. No one reported missed appointments due to operating hours of the ANC clinic in Intervention group. There were no significant changes in Control group seven months after the baseline study.

According to the findings of the study, operating hours also had a bearing on missed appointments. Majority of ANC clients in both facilities were not satisfied with the number of hours the facilities operate. For example, in Intervention group, 40 (57.1%) were very dissatisfied with operating hours of the ANC clinic, with only 15 (21.4%) stating that they were satisfied. In Control group, however, 35 (58.3%) were dissatisfied with operating hours of the ANC clinic while 25 (41.7%) confirming that they are satisfied with the number of hours. Due to the high number of ANC clients reporting dissatisfaction with operating hours, majority of them also reported that they have missed their appointments due to the operating hours of the facilities. For example, majority 55 (78.6%) ANC clients stated that they have at one point missed their appointments due to the facility operating hours in Intervention group. 35 (58.3%) ANC clients stated that they have at one point missed their appointments due to the facility operating hours in the Control group. Despite the high number of missed appointments reported above, majority of ANC clients acknowledge that ANC services in the facilities are important for their pregnancies. For example, 35 (50%) ANC clients

reported that ANC services are very important to them in Intervention group. 24 (48%) ANC clients reported that ANC services are very important to them in the Control group. However, in Intervention group, some 5 (7.1%) ANC clients in Intervention group did not know whether services are important or not. The following table 4.9 shows a summary of quality of services as rated by ANC clients and their satisfaction with the services received before the intervention in Intervention County and Control County and after the intervention in Intervention County.

Table 4.9

Quality of services received and operating hours.

	Baseline					**End line**			
Variables	**Name of Hospital**					**Name of Hospital**			
	Intervention		**Control**			**Intervention**		**Control**	
	N	**%**	**N**	**%**		**N**	**%**	**N**	**%**
Quality of Services Received									
Good	15	21.4	26	43.3	Good	50	75.8	22	36.7
Fair	25	35.7	19	38	Fair	10	15.1	20	33.3
Poor	30	42.9	15	25	Poor	6	9.1	18	30.0
Satisfaction with quality of services									
Satisfied	15	21.4	20	40	Satisfied	50	75.8	25	41.7
Dissatisfied	25	35.7	30	60	Dissatisfied	16	24.2	35	58.3
Very dissatisfied	30	42.9	0	0	Very dissatisfied	0	0	0	0
Satisfaction with operating hours									
Satisfied	15	21.4	25	41.7	Satisfied	47	71.2	27	45.0
Dissatisfied	15	21.4	35	58.3	Dissatisfied	19	28.8	33	55.0
Very dissatisfied	40	57.1	0	0	Very dissatisfied	0	0	0	0
Missed appointments due to operating hours									
Yes	55	78.6	35	58.3	Yes	0	0	30	50.0
No	15	21.4	25	41.7	No	66	100	30	50.0

A cross tabulation was done between satisfaction with operating hours and missed appointment due to the operating hours of the facilities and the results show a direct relationship whereby those who were satisfied with the operating hours never missed any appointment because of the working hours of the facility. For example, in both the facilities all ANC clients who said they were satisfied with the working hours reported that they have never missed any of their appointment for that reason, and those who reported that they were dissatisfied had missed their appointment at some point because of the operating hours. A cross tabulation done between satisfaction with facility cleanliness and missed appointment also demonstrated a direct relationship whereby majority of the ANC clients who were satisfied with the facility cleanliness had not missed their appointments for the same reason. For example, in Intervention group, all ANC clients who said they were satisfied with the facility cleanliness reported that they had never missed any of their appointment due to sanitation issues in the facility, and all those who reported that they were dissatisfied had missed their appointment at some point because of the facility cleanliness. The same relationship was witnessed in Control group. The following table 4.10 show a summary of the relationship between satisfaction with operating hours and missed appointment due to operating hours of the facilities, and satisfaction with facility cleanliness and missed appointment due to facility cleanliness, respectively.

Table 4.10

Operating hours, cleanliness and missed appointment crosstabulation.

Satisfaction with operating hours	Missed appointment due to operating hours											
	Intervention group						Control group					
	Yes		No		Total		Yes		No		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Satisfied	0	0	15	21.4	15	21.4	0	0	25	41.7	25	41.7
Dissatisfied	15	21.4	0	0	15	21.4	35	58.3	0	0	35	58.3
Very dissatisfied	40	57.1	0	0	40	57.1	0	0	0	0	0	0
Total	**55**	**78.6**	**15**	**21.4**	**70**	**100**	**35**	**58.3**	**25**	**41.7**	**60**	**100**

Satisfaction with facility cleanliness	Missed appointment due to cleanliness											
	Intervention group						Control group					
	Yes		No		Total		Yes		No		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Satisfied	0	0	15	21.4	15	21.4	0	0	27	45	27	45
Dissatisfied	55	78.6	0	0	55	78.6	31	51.7	2	3.3	33	55
Total	**55**	**78.6**	**15**	**21.4**	**70**	**100**	**31**	**51.7**	**23**	**48.3**	**60**	**100**

The findings above are similar to those documented by Garrison *et al*. (2011) that consultation process directly influence missed appointment. In their study, Garrison *et al*. (2011) stated 30% of patients missed their appointments because the hospitals had a tedious consultation process, which consumed too much time. In their responses as to why they missed their appointments, 70% of patients cited that consultation process was confusing with limited operating hours. Therefore, these findings concur with those of this study that consultation process is a major contributing factor to missed appointment rates.

4.7 The Contribution of Health workers on Adherence to Appointments in Antenatal clinics

The results obtained from individual indicators used to the contribution of health workers on adherence to ANC appointments are presented under this section.

4.7.1 Staff Responsiveness

Before the intervention, the baseline findings showed that staff responsiveness towards ANC clients plays an integral part in adherence to appointments in ANC clinics. Staff responsiveness appears differently in Intervention group and Control group. For example, while majority 55 (78.6%) ANC clients in Intervention group reported being dissatisfied with the way staff respond to their needs, majority 33 (55%) ANC clients in Control group said they were satisfied with staff responsiveness towards their needs. However, both facilities recorded great dissatisfaction with consistency of service delivery. In Intervention group, 20 (28.6%) said they were very dissatisfied with the consistency of service delivery, with majority 35 (50%) stating that they were dissatisfied with the lack of consistency in service delivery. The results are not any different in Control group where majority 35 (58.3%) reported being dissatisfied with the consistency of service delivery despite being satisfied with the way the health workers respond to their health care needs.

With the consistency of service delivery registering dissatisfaction among majority of ANC clients in both facilities, half 35 (50%) of the ANC clients in Intervention group reported that they are rarely served with the same health worker every time they visit the facility for ANC services. Another 35 (50%) said it is only sometimes that they are served with the same health worker. The findings are different in Control group where only 15 (25%) said they are rarely served with the same health worker, with majority 45 (75%) saying it is only sometimes they see the same health

worker when they visit the facility. This shows the dissatisfaction with the lack of consistency in service delivery registered in both the facilities. When asked whether they have ever missed any ANC appointments because of the lack of health worker responsiveness towards their health need, majority, 50 (71.4%) in Intervention group confirmed that the lack of responsiveness has contributed to their missing appointments before. However, only 27 (45%) in Control group said they have ever missed their ANC appointments because of the lack of responsiveness of the health workers towards their health needs.

After the intervention in Intervention County, the end line findings showed that the intervention greatly improved staff responsiveness in Intervention group in ANC clinics. For example, after the intervention, majority 51 (77.3%) ANC clients in Intervention group reported being satisfied with the way staff responds to their needs. Missed appointments associated with staff responsiveness also declined significantly as only 9 (13.6%) reported having missed an appointment due to their dissatisfaction with staff responsiveness. There were no significant changes in Control group. Table 4.11 shows a summary of these findings.

Table 4.11

Staff Responsiveness

Variables	Baseline					End line			
	Name of Hospital					Name of Hospital			
	Intervention		Control			Intervention		Control	
	N	%	N	%		N	%	N	%
Satisfaction with Staff Responsiveness									
Satisfied	15	21.4	33	55	Satisfied	51	77.3	33	55.0
Dissatisfied	55	78.6	27	45	Dissatisfied	15	22.7	27	45.0
Missed appointments due to staff responsiveness									
Yes	50	71.4	27	45	Yes	9	13.6	25	41.7
No	20	28.6	33	55	No	57	86.4	35	58.3

A cross tabulation was done between satisfaction with staff responsiveness toward health needs and missed appointment due to the lack of staff responsiveness and the results show a direct relationship whereby those who were satisfied with the responsiveness of the health workers towards their health need never missed any appointment before because of the same reason. For example, in both the facilities all ANC clients who said they were satisfied staff responsiveness toward health needs reported that they have never missed any of their appointment for that reason, and those who reported that they were dissatisfied had missed their appointment at some point because of the lack of health worker responsiveness. The following Table 4.12 shows a summary of the relationship between satisfaction with staff responsiveness toward health needs and missed appointment due to the lack of staff responsiveness.

Table 4.12

Satisfaction with staff responsiveness towards health need and missed appointment crosstabulation.

Satisfaction with staff responsiveness	**Missed appointment due to lack of staff responsiveness**											
	Intervention group						**Control group**					
	Yes		No		Total		Yes		No		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Satisfied	0	0	15	21.4	15	21.4	0	0	33	55	33	55
Dissatisfied	50	71.5	5	7.1	55	78.6	27	45	0		27	45
Total	50	71.5	20	28.5	70	100	27	45	33	55	60	100

The above findings are in concurrence with those of Oppenheimer (2013) that the lack of adequate competent health workers who can effectively respond to patient needs directly impedes health service delivery, leading to numerous missed appointments. In addition, Oppenheimer (2013) agrees that even though there is a great need for more health workers in order to meet the current need to improve maternal health and reduce child mortality, reducing missed appointment rates does not only require health workers, but adequate competent health personnel with the ability to respond to the health needs and deliver services in a timely manner. The study added that patients may be reluctant to attend appointments due to fear of lack of adequate health personnel who can effectively respond to their health needs. The findings of Palmer (2011) also support the findings of this study by asserting that patients tend to miss more appointments when they are not satisfied with the way health workers respond to their needs.

4.7.2 Staff Attitude

Before the intervention, the baseline findings reveal that staff attitude significantly contributes to adherence to appointments in ANC clinics. When ANC clients in Intervention group were asked how they found attitude of the health workers during service delivery, majority, 40 (57.1%) said the health workers were rude. In Control group, 15 (25%) reported that the health workers were rude to them during service delivery, and majority 27 (45%) mentioned that staff at the clinic are not friendly to them at all. The satisfaction level with staff attitude is also wanting in in both facilities. For example, majority, 40 (57.1%) of ANC client in Intervention group reported that they were not satisfied with the kind of attitude the health workers are exhibiting during service delivery. 30 (50%) of ANC client in Intervention group and Control group reported that they were not satisfied with the kind of attitude the health workers are exhibiting during service delivery. In fact, about 10

(14.3%) in the Intervention group were very dissatisfied with staff attitude towards them. Also, 15 (25%) ANC clients in the Control group were very dissatisfied with staff attitude towards them.

The findings of the study have also revealed that the dissatisfaction with the attitude of the health workers during service delivery is responsible for missed appointments in the ANC clinics. For example, in Intervention group, majority, 50 (71.4%) confirmed that they have at one point missed their ANC appointment because of the attitude of health workers during service delivery. Also, 34 (56.7%) in the Control group confirmed that they have at one point missed their ANC appointment because of the attitude of health workers during service delivery. The relationship between health workers and ANC clients also surfaced as an issue to adherence to ANC appointments based on the findings of the study. Majority, 41 (58.6%) ANC clients affirmed that there were dissatisfied with the nature of their relationship with health workers in Intervention group. In the Control group, 35 (58.3%) ANC clients affirmed that there were dissatisfied with the nature of their relationship with health workers. In addition, majority 50 (71.4%) in Intervention group stated that they have at one point missed their appointments because of the nature of relationship between them and the health workers. 37 (61.6%) in Control group respectively stated that they have at one point missed their appointments because of the nature of relationship between them and the health workers.

After the intervention in Intervention County, the end line findings revealed that staff attitude in Intervention County hospital significantly got impacted by the intervention. Majority, 48 (72.7%) said the health workers were friendly, and only 18 (27.3%) stated that they still found health workers not friendly. In Control group, seven months later, 13 (21.7%) are still reporting that the health workers were rude to them during service delivery, with majority 31 (51.7%) mentioning that staff

at the clinic are not friendly at all. The satisfaction level with staff attitudes also improved significantly in Intervention group after the intervention. For example, majority, 50 (75.8%) stated that they are satisfied with the current staff attitude. Missed appointments in the ANC clinics due to staff attitude has also reduced significantly in Intervention group. For example, only 14 (21.2%) reported that they have missed appointment before due to their dissatisfaction with staff attitude. The relationship between health workers and ANC clients also appears to have been improved in Intervention group. Majority, 49 (74.2%) of ANC clients affirmed that there were satisfied with the nature of their relationship with health workers. Additionally, only 13 (19.7%) reported that they have at one point missed their appointments because of the nature of relationship between them and the health workers. There were no significant changes in Control group. Table 4.13 shows a summary of staff attitude and satisfaction with staff attitude during service delivery respectively before the intervention in Intervention and Control County and after the intervention in Intervention County.

Table 4.13

Staff Attitude

Variables	Baseline					Endline			
	Name of Hospital					Name of Hospital			
	Intervention		Control			Intervention		Control	
	N	%	N	%		N	%	N	%
Staff attitude during service delivery									
Friendly	15	21.4	18	36	Friendly	48	72.7	13	21.7
Not friendly	40	57.1	27	45	Not friendly	18	27.3	31	51.7
Rude	15	21.4	15	25	Rude	0	0	16	26.6
Satisfaction with staff attitude									
Satisfied	20	28.6	15	30	Satisfied	50	75.8	20	33.3
Dissatisfied	40	57.1	30	50	Dissatisfied	16	24.2	29	48.3
Very dissatisfied	10	14.3	15	25	Very dissatisfied	0	0	11	18.4
Satisfaction with patient-health worker relationships									
Satisfied	19	27.1	25	41.7	Satisfied	49	74.2	25	41.7
Dissatisfied	41	58.6	35	58.3	Dissatisfied	17	25.8	35	58.3
Very dissatisfied	10	14.3	0	0	Very dissatisfied	0	0	0	0
Missed appointments due to staff attitude									
Yes	50	71.4	34	56.7	Yes	14	21.2	34	56.7
No	20	28.6	26	43.3	No	52	78.8	26	43.3
Missed appointments due to patient-health worker relationships									
Yes	50	71.4	37	61.6	Yes	13	19.7	37	61.7
No	20	28.6	23	38.4	No	53	80.3	23	38.3

A cross tabulation done between health workers attitude and missed appointment due to the staff attitude during service delivery in the facilities show a direct relationship whereby all ANC clients who found staff rude during service delivery have missed appointment at some point because of the attitude of the health workers. For example, in both the facilities all ANC clients who said the health workers were rude and not friendly during service delivery have ever missed their

appointment for that reason, and those who reported that they were friendly had not missed their appointment because of the staff attitude. Another cross tabulation done between satisfaction with patient-health worker relationship and missed appointment due to the nature of the relationship also demonstrated a direct relationship whereby majority of the ANC clients who were satisfied with their relationship with the health workers had not missed their appointments for the same reason. For example, in both Intervention group and Control group, all ANC clients who said they were satisfied with the patient-health worker relationship reported that they have never missed any of their appointment due to such relationship, and majority of those who reported that they were dissatisfied had missed their appointment at some point because of the same reason. The following Table 4.14 shows a summary of the relationship between staff attitude and missed appointment due to staff attitude, and satisfaction with patient- health worker relationship and missed appointment due to the patient-health worker relationship, respectively.

Table 4.14

Staff attitude and missed appointment due to staff attitude crosstabulation.

Staff attitude	Missed appointment due to staff attitude											
	Intervention group						Control group					
	Yes		No		Total		Yes		No		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Friendly	0	0	15	21.4	15	21.4	0	0	18	30	18	30
Not friendly	35	50	5	7.6	40	57.2	20	33.3	7	11.7	27	45
Rude	15	21.4	0	0	15	21.4	15	25	0	0	15	25
Total	**50**	**71.4**	**20**	**28.6**	**70**	**100**	**35**	**58.3**	**25**	**31.7**	**60**	**100**

Satisfaction with patient-health worker relationship	Missed appointment due to the relationship											
	Intervention group						Control group					
	Yes		No		Total		Yes		No		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Satisfied	0	0	19	27.2	19	27.2	0	0	25	41.7	25	41.7
Dissatisfied	40	57.2	1	1.4	41	58.6	35	58.3	0	0	35	58.3
Very dissatisfied	10	14.3	0	0	10	14.2	0	0	0	0	0	0
Total	**50**	**71.4**	**20**	**28.6**	**70**	**100**	**35**	**58.3**	**25**	**41.7**	**60**	**100**

The findings above are similar to those of Oppenheimer (2013) who reported that patients who find health workers less friendly tend to avoid seeking health services in those facilities, leading to high missed medical appointment rates. In addition, patients tend to avoid facilities where they are not cared for or addressed well. Oppenheimer (2013) also suggested that a culturally competent health care system improves health worker patient relations, resulting in quality of care. Also, patients tend to show up for their medical appointments when they are certain about the professionalism of the health care providers. The findings of the study also agree with Ferlie et al. (2011) that there is a

high likelihood of minimal missed appointments where workers are professional and friendly to the patients.

4.8 The Influence of Access to Services on Adherence to Appointments in Antenatal Clinics

The results obtained from individual indicators used to measure access to services are presented under this section.

4.8.1 Opportunity Cost

Opportunity cost in this section refers to the cost of seeking the services in terms of the forgone alternative. With the poverty level of up to 50.3% in both Intervention and Control Counties, many mothers spend their day trying to fend for their young ones, with little time left to seek ANC services. Before the intervention, when asked how they would rate the cost of seeking ANC services in terms of what they forgo or spend, majority, 50 (71.4%) of ANC clients reported that the cost is high in Intervention group. 25 (41.7%) of ANC clients reported that the cost is high in the Control group. Another 20 (28.6%) in Intervention said the opportunity cost is very high, with 15 (25%) in Control saying the cost is very high. With the high opportunity cost reported in both Intervention group and Control group, ANC clients were asked if they are likely to forgo their daily work to seek ANC service. Even though majority, 40 (57.1%) in Intervention said they would probably forgo their work, about 20 (28.6%) reported that they would possibly not leave their work to seek ANC services. In the Control group, 15 (25%) reported that they would possibly not leave their work to seek ANC services, with 25 (41.7%) saying they would probably forgo their work.

With the majority of ANC clients reporting high opportunity costs as shown in the above findings,

ANC clients were asked if they have ever missed their appointments due to the opportunity cost of seeking those services. In Intervention group, majority, 55 (78.6%) reported that they have ever their missed appointment because of the opportunity cost, while half, 30 (50%) in Control group said they have ever missed their ANC appointments because of the cost of seeking those services. The following table 4.15 shows a summary opportunity cost of seeking ANC services and the likelihood of forgoing daily work to seek ANC services, respectively.

Table 4.15

The opportunity cost of seeking ANC services.

Variables	**Name of Hospital**			
	Intervention		**Control**	
	N	**%**	**N**	**%**
Opportunity Cost				
Very high	20	28.6	15	25
High	50	71.4	25	41.7
Low	0	0	20	40
Likelihood of forgoing work to seek services				
Probably	40	57.1	25	41.7
Possibly	10	14.3	20	40
Possibly not	20	28.6	15	25
Missed appointments due to opportunity cost				
Yes	55	78.6	30	50
No	15	21.4	30	50

A cross tabulation done between opportunity cost of seeking ANC services and missed appointment due to the opportunity cost demonstrate a direct relationship whereby majority of ANC clients who found the opportunity cost of seeking service high have missed appointment at some point because of that cost. For example, in Intervention group, 20 (100%) of those who reported that the opportunity cost is very high said they have ever missed their appointments because of the same. In Control group, 25 (100%) of those who said that the cost is high also

reported that they have ever missed the appointment because of the opportunity cost of seeking ANC services. The following table 4.16 shows a summary of the relationship between opportunity cost of seeking ANC services and missed appointment.

Table 4.16

Opportunity cost of seeking ANC services and missed appointments due to the opportunity cost crosstabulation.

Opportunity cost	**Missed appointment due to opportunity cost**											
	Intervention group						**Control group**					
	Yes		**No**		**Total**		**Yes**		**No**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Very high	20	28.6	0	0	20	28.6	10	16.7	5	8.4	15	25
High	35	50	15	21.4	50	71.4	25	41.7	0	0	25	41.7
Low	0	0	0	0	0		0	0	20	33.3	20	33.3
Total	**55**	**78.6**	**15**	**21.4**	**70**	**100**	**35**	**58.3**	**25**	**41.7**	**50**	**100**

The findings shown above agree with those of Einstein (2012) that reported that mothers tend to get occupied trying to make ends meet and would rather stay home working than seek scheduled medical services. Einstein (2012) also noted that whether or not a client chooses to pay for a particular service can also be affected by the client's assessment of this service's value. This is similar to the study findings that have reported some ANC clients not leaving their work to seek services. Einstein (2012) also document that in areas where families hardly have three meals a day, people tend to prefer to work on providing for families than seek medical services that take them a whole day to receive. This is also similar to the study finding as majority finds the opportunity cost of seeking the services very high as shown in the above findings of the study. A KDHS (2014) also reported that 44% of Kenyans who are ill do not seek health care because of the high cost of accessing the services, either through forgoing their daily businesses or paying for the service.

4.8.2 Facility Location

Facility location or proximity to the facility has been proven to significantly contribute to the adherence to medical appointments. This study has corroborated earlier findings and confirms facility location influences adherence to ANC appointments in Intervention group and Control group. When ANC client were asked how long they travel to get to the facility, majority, 35 (50%) in the Intervention group said they travel for at least 30 minutes. 25 (41.7%) in the Control group said they travel for at least 30 minutes. However, another 10 (14.3%) in Intervention travel for at least 60 minutes to get to the facility. In the Control group, 24 (40%) travel for at least 60 minutes to get to the facility. When asked about their satisfaction level with the duration of travel, majority 35 (50%) in Intervention group reported that they were dissatisfied, with 20 (28.4%) saying they are very dissatisfied with how long they take to travel. In Control group, majority 35 (58.3%) were satisfied with the duration of travel with only 25 (41.7%) reporting dissatisfaction.

With majority of ANC clients reporting high dissatisfaction levels with facility location as shown in the findings above, ANC clients were asked if they have ever missed appointments because of the distance to the facility. Majority, 55 (78.6%) in Intervention group reported that they have ever missed their appointments because of facility location. In Control group, however, only 20 (40%) said they have missed their appointment before because of the distance to the facility. The following table 4.17 shows a summary of how long ANC clients travel to reach the facility and their satisfaction with the duration respectively.

Table 4.17

Facility Location

Variables	Name of Hospital			
	Intervention		Control	
	N	%	N	%
Duration of travel to facility				
15-29 minutes	15	21.4	0	0
30-44 minutes	35	50	25	41.7
45-59 minutes	10	14.3	11	18.3
≥60 minutes	10	14.3	24	40
Satisfaction with facility location				
Satisfied	15	21.4	35	58.3
Dissatisfied	35	50	25	41.7
Very dissatisfied	20	28.6	0	0
Missed appointments due to facility location				
Yes	55	78.6	25	41.7
No	15	21.4	35	58.3

A cross tabulation done between duration of travel to seek ANC services and missed appointment due to the facility location show a direct relationship whereby majority of ANC clients who travel for longer have missed appointment at some point because of the distance to the facility. For example, in Intervention group, 35 (100%) of those who reported that they travel for at least 30 minutes said they have ever missed their appointments because of the distance. In Control group, 25 (100%) of those who said that they travel for at least 60 minutes also reported that they have ever missed the appointment because of the facility location. The following table 4.18 shows a summary of the relationship between duration of travel to facility and missed appointment due to facility location.

Table 4.18

Duration of travel to the health facility and missed appointment due to facility location crosstabulation.

Travel duration to the facility	Missed appointment due to facility location											
	Intervention group						Control group					
	Yes		No		Total		Yes		No		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
<29 minutes	0	0	15	21.4	15	21.4	0	0	0	0	0	0
30-44 minutes	35	50	0	0	35	50	0	0	25	41.7	25	41.7
45-59 minutes	10	14.3	0	0	10	14.3	0	0	10	16.6	10	16.6
≥60 minutes	10	14.3	0	0	0	14.3	25	41.7	0	0	25	41.7
Total	**55**	**78.6**	**15**	**21.4**	**70**	**100**	**25**	**41.7**	**35**	**58.3**	**60**	**100**

The findings shown above are in coherent with those of Wamala et al. (2010), that proximity to the facility or facility location is a great factor that influence missed appointments. According to Wamala et al. (2010), the further the facility, the more likely that the patients will miss their appointment. The findings are also supported by those of KDHS (2014) which documented that 18% of Kenyans who are ill do not seek health care because of the distance they have to travel to seek medical care. In addition, KDHS (2014) asserts that in instances where facilities are not within close proximity or located far from the people, many health care seekers may not find it useful to attend an appointment even if the services are affordable and acceptable. These previous findings support the findings of the study that the longer the distance to the facility the higher the likelihood of missing ANC appointments.

4.9 The influence of patient characteristics on adherence to appointments in antenatal clinics

The results obtained from individual indicators used to measure patient characteristics are presented under this section.

4.9.1 Age

Literature shows that the age of ANC clients has a bearing on adherence to appointments. Based on this information, the study categorized ANC clients into different age cluster to determine how age is related to adherence to appointments in ANC clinics. With the age distribution as presented in the demographics section, ANC clients were asked if they were having their first pregnancy, if they were having their first ANC visit for the pregnancy, and how long they had been pregnant in order to determine how experience influence adherence to ANC appointments. When asked if they were having their first pregnancy, majority 40 (57.1%) in the Intervention group reported that it was not their first pregnancy. 35 (58.3%) in the Control group said that it was not their first pregnancy. When asked if they were having their first ANC appointment, majority 40 (57.1%) in Intervention group said it was not the first visit, while half, 30 (50%) in Control group said it was their first ANC visit. With many ANC clients reporting that it was their first pregnancy and the first ANC visit, they were asked how long they had been pregnant to determine what trimester they made their first visit. The findings showed that the majority, 35 (50%) in Intervention group were just beginning their second trimester at four months. In Control group only 5 (8.3%) were at two months. Table 4.19 shows a summary of the number of the pregnancy, number of ANC visit and duration of the pregnancy, respectively.

Table 4.19

Pregnancy and ANC visits

Variables	Name of Hospital			
	Intervention		Control	
	N	%	N	%
First pregnancy				
Yes	30	42.9	25	41.7
No	40	57.1	35	58.3
Pregnancy duration				
2 months	0	0	5	8.3
3 months	20	28.6	25	41.7
4 months	35	50	15	25
5 months	10	14.3	10	16.7
6 months	5	7.1	5	8.3
First antenatal visit for pregnancy				
Yes	30	42.9	30	50
No	40	57.1	30	50

When ANC clients were asked if they have ever missed their appointments for any other reason other than what has been stated above, majority, 59 (84.3%) in the Intervention group reported that they have missed their ANC appointments before for other reasons including but not limited to forgetfulness and the fear of corona virus in the hospitals. Also, 38 (63.3%) in the Control group said that they have missed their ANC appointments before for other reasons including but not limited to forgetfulness and the fear of corona virus in the hospitals. Notably, after the intervention in Intervention group, only 10 (15.2%) of ANC clients reported that they have ever missed their appointments for other reasons other than the metrics already used above, including but not limited to forgetfulness and the fear of corona virus in the hospital. Even though an intervention was not done in Control group, missed appointment rate reduced to 35 (58.3%) seven months after the baseline study.

A cross tabulation was done between the age of the respondents and missed appointment for any reason whatsoever to determine how age contributes to adherence to appointments. The result of the cross tabulation shows that the younger the ANC client, the more likely that they have ever missed their ANC appointment before. These results confirm that young mothers tend to miss more appointments compared to the elder mothers. The summary is shown in table 4.28. A cross tabulation between the duration of the pregnancy and the first visit also shows that majority, 20 (28.5%) in the Intervention group make their first ANC visit at the third month of their pregnancy. 25 (41.7%) in the Control group make their first ANC visit at the third month of their pregnancy. However, there are other mothers 10 (14.3%) whose first ANC visit were at the fourth month and second month in Intervention group. 5 (8.3%) whose first ANC visit were at the fourth month and second month in the Control group. Table 4.20 below shows summary of these results.

Table 4.20

Age, pregnancy duration and first visit and missed appointments crosstabulation.

Age	Missed appointment before											
	Intervention group						Control group					
	Yes		No		Total		Yes		No		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
18-22	20	28.6	0	0	20	28.6	10	16.7	0	0	10	16.7
23-27	10	14.3	0	0	10	14.3	10	16.7	0	0	10	16.7
28-32	19	27.1	6	8.6	25	35.7	15	25	5	8.3	20	33.3
33-37	10	14.3	5	7.1	15	21.4	3	5	17	28.3	20	33.3
Total	**59**	**84.3**	**11**	**15.7**	**70**	**100**	**38**	**63.3**	**22**	**36.7**	**60**	**100**

Duration of pregnancy	First ANC visit											
	Intervention group						Control group					
	Yes		No		Total		Yes		No		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
2 months	0	0	0	0	0	0	5	8.3	0	0	5	8.3
3 months	20	28.6	0	0	20	28.6	25	41.7	0	0	25	41.7
4 months	10	14.3	25	35.7	35	50	0	0	15	25	15	25
5 months	0	0	10	14.3	10	14.3	0	0	10	16.7	10	16.7
6 months	0	0	5	7.1	5	7.1	0	0	5	8.3	5	8.3
Total	**30**	**42.9**	**40**	**57.1**	**70**	**100**	**30**	**50**	**30**	**50**	**60**	**100**

The findings shown above are in coherent with those of Prasad and Anand (2012) that older age was associated with lower missed appointment rate. Prasad and Anand (2012) also asserted that older people tend to honor their appointments compared to young people. Sims et al., (2012) documented similar findings, and adding that missed appointment rates are even lower among women of older age. These findings are in support of the study findings which have shown that younger women miss their ANC appointments more compared to the older women.

4.9.2 Socioeconomic factors

Literature has linked socioeconomic factors such as marital status, employment and income level to adherence to ANC appointments. The findings of this study are in coherence with the literature.

A cross tabulation was done between the marital status of the respondents and missed appointment for any reason whatsoever to determine how marital status contributes to adherence to appointments. The result of the cross tabulation shows that the married respondents tend to honor ANC appointments more than other respondents with other marital statuses. The summary is shown in table 4.21. A cross tabulation between the income level and missed appointment for any reason whatsoever to determine how income level contributes to adherence to appointments. The result in both Intervention group and Control group shows that the lower the income level the higher the likelihood of missing an appointment as shown in table 4.21.

Table 4.21

Marital status, income level and missed appointment crosstabulation.

Marital status	**Missed appointment before**											
	Intervention group						Control group					
	Yes		**No**		**Total**		**Yes**		**No**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Single	15	21.4	0	0	15	21.4	13	21.7	0	0	13	21.7
Married	7	10	28	40	35	50	9	15	18	30	27	45
Widow	5	7.2	0	0	5	7.2	8	13.3	2	3.3	10	16.7
Separated	10	14.3	0	0	10	14.3	6	10	0	0	6	10
Cohabiting	1	1.4	4	5.7	5	7.2	0	0	4	6.7	4	6.7
Total	**38**	**54.3**	**32**	**45.7**	**70**	**100**	**36**	**60**	**24**	**40**	**60**	**100**

Income level	**Missed appointment before**											
	Intervention group						Control group					
	Yes		**No**		**Total**		**Yes**		**No**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
0-9999	20	28.6	0	0	20	28.6	15	25	0	0	15	25
10000-19999	34	48.6	1	1.4	35	50	6	10	4	6.7	10	16.7
20000-29999	5	7.2	5	7.2	10	14.3	13	21.7	2	3.3	15	25
30000-39999	0	0	5	7.2	5	7.2	0	0	15	25	15	25
40000 and above	0	0	0	0	0	0	0	0	5	8.3	5	8.3
Total	**59**	**84.3**	**11**	**15.7**	**70**	**100**	**34**	**56.7**	**26**	**43.3**	**60**	**100**

The findings shown above are in coherent with those of Prasad and Anand (2012) which reported that people with low social status and low-income bracket tend to have multiple missed appointments compared to their counterparts in middle and high social status and income bracket. The findings of the study are also in agreement with Gengiah et al. (2014) that poverty not only limits people from accessing health services, but also restricts them from participating in making decisions affecting their health, leading to missed appointments. Gengiah et al. (2014) also added that challenging socio-economic conditions are detrimental to healthcare in multiple ways,

including resulting in missed appointments, and these are in concurrence with the findings of the study as reported above.

Inferential statistics analysis

When a binary logistic regression analysis was done between Organization of MCH services (patient waiting time and consultation process) and the appointment adherence (missed appointments), the findings showed that the independent variables have a positive impact on the dependent variable. For example, an increase in satisfaction with waiting time increases the chances of adhering to appointments. Table 4.22 below shows a summary of these results.

Table 4.22

Binary logistic regression analysis between organization of MCH services and appointment adherence

Organization of MCH services logistic regression							
		Baseline				95% C.I. for AOR	
	Variables	Category	B	Sig.	AOR	Lower	Upper
Step 1[b]	Waiting time	Satisfied	0.210	0.021	1.211	0.5217	2.501
		Dissatisfied	0.270	0.042	0.003	0.329	2.297
	Consultation process	Satisfied	0.824	0.023	1.097	1.018	3.241
		Dissatisfied	0.432	0.039	0.051	1.751	3.542
		Constant	-3.492	0.002	0.032		
		End line				95% C.I. for AOR	
	Variables	Category	B	Sig.	AOR	Lower	Upper
Step 1[b]	Waiting time	Satisfied	0.340	0.018	1.406	0.617	3.203
		Dissatisfied	0.250	0.030	0.006	0.412	2.701
	Consultation process	Satisfied	0.734	0.036	2.083	1.051	4.131
		Dissatisfied	0.531	0.027	0.059	1.078	3.251
		Constant	-3.454	0.002	0.032		
a. Variable(s) entered on step 1: satisfaction with waiting time, satisfaction with consultation process.							

Adopted Logistic Regression Equation

$$P(Y_i) = \frac{1}{1 + e^{-(b_0 + b_1 X_{1i})}}$$

where

- $P(Y_i)$ is the predicted probability that Y is true for case i;
- e is a mathematical constant of roughly 2.72;
- b_0 is a constant estimated from the data;
- b_1 is a b-coefficient estimated from the data;
- X_i is the observed score on variable X for case i.

From the binary logistic regression analysis above, satisfaction with patient waiting time has an adjusted odds ratio of 1.406 after the intervention, indicating that when a patient is satisfied with patient waiting time, the chances of adhering to appointments increases by 1.406 provided all other factors are held constant. In addition, satisfaction with patient waiting time has a p-value of 0.018, showing a significant relationship with missed appointments. In addition, dissatisfaction with patient waiting time has an adjusted odds ratio of 0.006, indicating that when a patient is dissatisfied with patient waiting time, the chances of adhering to appointments only increases by 0.006 provided all other factors are held constant. These findings demonstrate that long patient waiting time is a deterrent to adherence to appointments for ANC services. Also, satisfaction with consultation process has an adjusted odds ratio of 2.083, indicating that an increase in satisfaction with consultation process by one unit increases the chances adhering to appointments by 2.083 provided all other factors are held constant. In addition, satisfaction with consultation process has a p-value of 0.036, showing a significant relationship with missed appointments. Additionally, dissatisfaction with consultation process has an adjusted odds ratio of 0.059, indicating that an increase in satisfaction with consultation process by one unit only increases the chances adhering to appointments by 0.059 provided all other

factors are held constant. There are significant differences in odds ratio before the intervention and after the intervention. For example, before the intervention, satisfaction with patient waiting time had an adjusted odds ratio of 1.211, and after the intervention, the odds ratio was 1.406. This shows that the chances of adhering to appointments after the intervention increased.

On analysis of odds ratio, the results also showed that, for Intervention group, the likelihood of a client missing an appointment when satisfied with consultation process is 54% less with an odds ratio of 0.462 (CI of 0.355 lower bound and 0.600 upper bound and a p-value <0.05). The likelihood of a client missing an appointment when satisfied with waiting time is also 72% less with an odds ratio of 0.281 (CI of 0.135 lower bound and 0.500 upper bound and a p-value <0.05). In Control group, odds ratio analysis shows that the likelihood of a client missing an appointment when satisfied with consultation process is 67% less with an odds ratio of 0.333 (CI of 0.201 lower bound and 0.553 upper bound and a p-value <0.05). The likelihood of a client missing an appointment when satisfied with waiting time is also 89% less with an odds ratio of 0.115 (CI of 0.305 lower bound and 0.643 upper bound and a p-value <0.05). Table 4.23 below shows a summary of these results.

Table 4.23

Odds ratio analysis for organization of MCH services and appointment adherence

Risk Estimate				
			95% Confidence Interval	
Medical facility		Value	Lower	Upper
Intervention group	Satisfaction with consultation process in the facility = satisfied	.462	.355	.600
	N of Valid Cases	70		
Control group	Satisfaction with consultation process in the facility = satisfied	.333	.201	.553
	N of Valid Cases	60		
Intervention group	Satisfaction with waiting time in the facility = satisfied	.281	.135	.500
	N of Valid Cases	70		
Control group	Satisfaction with waiting time in the facility = satisfied	.115	.305	.643
	N of Valid Cases	60		

Pearson Chi-Square test run between organization of MCH services (patient waiting time, consultation process) and appointment adherence (missed appointment) depicted a significant relationship between the variables. The following table 4.24 shows the result.

Table 4.24

Chi-Square test between Organization of MCH services and appointment adherence

Chi-Square Test at baseline				
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	51.512[a]	2	0.000	0.000
Likelihood Ratio	52.412	2	0.000	0.000
Fisher's Exact Test	47.231	2	0.000	0.000
N of Valid Cases	130			
Chi-Square Test at End line				
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	52.632[a]	2	0.000	0.000
Likelihood Ratio	53.232	2	0.000	0.000
Fisher's Exact Test	49.221	2	0.000	0.000
N of Valid Cases	126			

Based on the Chi-Square test above, the Pearson Chi-Square = 52.632, degree of freedom = 2, and p value = 0.000. Also, the likelihood ratio = 53.232, degree of freedom =2, and p value =0.000. This shows that there is a significant relationship between organization of MCH services and adherence to appointments. Therefore, the study concludes that organization of MCH services influences adherence to appointments.

Hospital managers from both Intervention group and Control group confirmed that their facility has an average waiting time of 40 minutes and 30 minutes, respectively. The following are excerpts from the two managers before the intervention:

> *"Despite Homabay county hospital serving the majority of the population in the county, we have a limited number of staff causing long waiting time, mostly 30 to 40 minutes" (HM1).*

> *"Kisumu county hospital, being situated in the CBD, we tend to have an influx of patients, but our staff try their best to serve them within 30 to 60 minutes maximum" (KM3).*

After the intervention in Homabay County, hospital managers have also acknowledged the influence that the intervention had on satisfaction with patient waiting time and missed appointments associated with patient waiting time. The following is an excerpt from one manager in Intervention group after the intervention:

> *"I think this is something we will be recommending to the management board. We have seen a tremendous improvement of uptake of ANC services despite the situation with the pandemic. Our turnaround time has actually been cut by half since the inception of this initiative" (HM1).*

The above findings show that consultation process is vital in promoting adherence to ANC appointments. Additionally, managers agree with the findings as in both the facilities, it was established that consultation process can be tedious, especially because of the operating hours in

ANC clinics. The following are excerpts from two managers from the facilities before the intervention.

> *"Homabay hospital has historically operated its ANC clinics from 8am to 1pm because of the previously limited number of mothers seeking the services. This sometimes mean not so much time is given to an individual, and the consultation process is hurried. However, we are working on new modalities to improve this" (HM2).*

> *"I think our consultation process here at Kisumu hospital is not complicated. However, because of the number we are currently serving, some processes are hurried as we could be serving more than two mothers in the same room, and this has previously brought about privacy concerns. The county government is, however, adjusting to suit all mothers" (KM4)*

After the intervention in Homabay County, hospital managers in Intervention group agree that the intervention has brought about a significant improvement in quality of services as well as their operating hours. The following is an excerpt from one manager from the facility.

> *"Increasing the number of operating hours has allowed us to provide services to more mothers. Even though this was a pilot initiative, going forward, we are seeking institutional policies to make the clinic working hours permanent despite the initially resistance by providers" (HM2).*

The above findings are supported by the findings of Garrison et al. (2011) that if the MCH services are to be universal, or a safety net for the poorest, there must be deliberate efforts to improve consultation process and minimize patient waiting time. Garrison et al. (2011) documented that organization of MCH services such as consultation process and patient waiting time are among the major factors associated with missed appointments; and that effective and efficient organization of services such as short patient waiting time, and quick, prompt consultation process could reduce missed appointment rates. These findings concur with those of this study, which suggests that in order to reduce missed appointment rates, patient waiting time must be reduced and consultation process improved.

From the binary logistic regression analysis run between health workers factors (staff attitude and staff responsiveness) and adherence to appointments (missed appointments), the results showed that independent variables have a positive impact on the dependent variable. Table 4.25 below shows a summary of these results.

Table 4.25

Logistic regression between health workers factors and appointment adherence.

Contribution of health workers logistic regression

		Baseline				95% C.I. for AOR	
	Variables	Category	B	Sig.	AOR	Lower	Upper
Step 1[b]	Staff responsiveness	Satisfied	0.330	0.015	1.103	0.817	3.204
		Dissatisfied	0.250	0.030	0.001	0.412	2.301
	Staff attitude	Satisfied	0.734	0.036	1.083	1.051	2.131
		Dissatisfied	0.531	0.028	0.059	1.073	2.251
		Constant	-3.454	0.002	0.037		
		End line				95% C.I. for AOR	
	Variables	Category	B	Sig.	AOR	Lower	Upper
Step 1[b]	Staff responsiveness	Satisfied	0.421	0.021	2.006	0.516	3.503
		Dissatisfied	0.530	0.035	0.005	1.046	4.303
	Staff attitude	Satisfied	0.824	0.042	1.383	1.087	5.231
		Dissatisfied	0.597	0.038	0.010	1.641	5.671
		Constant	-5.433	0.001	0.534		

a. Variable(s) entered on step 1: satisfaction with staff responsiveness, satisfaction with staff attitude.

Adopted Logistic Regression Equation

$$P(Y_i) = \frac{1}{1 + e^{-(b_0 + b_1 X_{1i})}}$$

where

- $P(Y_i)$ is the predicted probability that Y is true for case i;
- e is a mathematical constant of roughly 2.72;
- b_0 is a constant estimated from the data;
- b_1 is a b-coefficient estimated from the data;
- X_i is the observed score on variable X for case i.

From the logistic regression model above, satisfaction with staff responsiveness has an adjusted odds ratio of 2.006, indicating that an increase in satisfaction with staff responsiveness by one unit increases chances of adhering to appointment by 2.006 provided all other factors are held constant. In addition, satisfaction with staff responsiveness has a p-value of 0.021, showing a significant relationship with missed appointments. Also, dissatisfaction with staff responsiveness has an adjusted odds ratio of 0.005 which means that when a client is dissatisfied with staff responsiveness, then the chances of adhering to appointments only increases by 0.005. Satisfaction with staff attitude has an adjusted odds ratio of 1.383, indicating that an increase in satisfaction with staff attitude by one unit increases chances of adhering to appointments by 1.383 provided all other factors are held constant. In addition, satisfaction with staff attitude has a p-value of 0.042, showing a significant relationship with missed appointments. Dissatisfaction with staff attitude has an adjusted odds ratio of 0.010, which means the chances of adhering to appointments only increases by 0.010 when a client is dissatisfied with staff attitude. There are significant differences in odds ratio before the intervention and after the intervention. For example, before the intervention, satisfaction with staff responsiveness had an adjusted odds ratio of 1.103, and after the intervention, the odds ratio was 2.006. This shows that the chances of adhering to appointments after the intervention increased.

Based on the odds ratio analysis for the Intervention group, the likelihood of a client missing an appointment when satisfied with staff responsiveness is 85% less with an odds ratio of 0.154 (CI of 0.087 lower bound and 0.272 upper bound and a p-value <0.05). The likelihood of a client missing an appointment when satisfied with staff attitude is also 89% less with an odds ratio of 0.115 (CI of 0.046 lower bound and 0.152 upper bound and a p-value <0.05).

In the Control group, odds ratio analysis shows that the likelihood of a client missing an appointment when satisfied with staff responsiveness is 67% less with an odds ratio of 0.333 (CI of 0.201 lower bound and 0.553 upper bound and a p-value <0.05). The likelihood of a client missing an appointment when satisfied with staff attitude is also 78% less with an odds ratio of 0.222 (CI of 0.105 lower bound and 0.255 upper bound and a p-value <0.05). Table 4.26 shows a summary of these findings.

Table 4.26

Odds ratio analysis between health workers factors and appointment adherence

Risk Estimate				
			95% Confidence Interval	
Medical facility		Value	Lower	Upper
Intervention group	Satisfaction with staff responsiveness = satisfied	.154	.087	.272
	N of Valid Cases	70		
Control group	Satisfaction with staff responsiveness = satisfied	.333	.201	.553
	N of Valid Cases	60		
Intervention group	Satisfaction with staff attitude = satisfied	.115	.046	.152
	N of Valid Cases	70		
Control group	Satisfaction with staff attitude = satisfied	.222	.105	.255
	N of Valid Cases	60		

A Pearson Chi-Square test done between health workers factors (staff responsiveness and staff attitude) and adherence to appointments show a significant relationship. Table 4.27 shows a summary of these results.

Table 4.27

Chi-Square tests between health workers factors and appointment adherence

Chi-Square Test at baseline				
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	24.292[a]	1	0.000	0.000
Likelihood Ratio	35.823	1	0.000	0.000
Fisher's Exact Test	31.522	1	0.000	0.000
N of Valid Cases	130			
Chi-Square Test at end line				
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	26.721[a]	1	0.000	0.000
Likelihood Ratio	36.201	1	0.000	0.000
Fisher's Exact Test	33.710	1	0.000	0.000
N of Valid Cases	126			

Based on the Chi-Square test above, the Pearson Chi-Square = 26.721, degree of freedom = 1, and p value = 0.000. Also, the likelihood ratio = 36.201, degree of freedom =1, and p value =0.000. This shows that there is a significant relationship between health workers factors and adherence to appointments. Therefore, the study concludes that health workers factors influences adherence to appointments.

The above findings show that staff responsiveness towards the health needs of ANC clients plays an integral role in promoting adherence to ANC appointments. These findings concur with some of the illustrations provided by the managers in both the facilities. Two managers confirmed that

when one health worker on duty serves most ANC clients, sometimes full responsiveness becomes an issue.

The following are excerpts from two managers before the intervention.

> *"Some of our mothers here complain about not being attended to adequately because we have one person serving all of them on a particular day. As you may know by now, Homabay County hospital serves many people, and the mothers also do not even want to be here for long time. When you hurry the process, they feel they are not given enough time" (HM1).*

> *"I think ANC is a bit delicate clinic, and we may not be able to satisfy all the needs, but we try our best here at Kisumu County hospital. We are, however, working on how to improve how we respond to the needs of our mothers" (KM3).*

After the intervention in Homabay County, the effect of the intervention on staff responsiveness has also been acknowledged by the Homabay county hospital managers. For example, one of the managers confirms that since the intervention began, they have received a lot of positive feedback from mothers regarding their staff members. The following is an excerpt from one manager.

> *"Our mothers continue to report positive comments about our staff. Our staff members have since adopted a patient centered care in which they do more listening and providing support, especially with the ongoing pandemic. They have become more responsive" (HM1).*

The findings of the study reveal that staff attitude contributes significantly to adherence to ANC

appointments. Two managers agree that the relationship between health workers and ANC clients sometimes seem strained from the perspective of the patient. The following are excerpts from the managers before the intervention.

> *"You know Homabay county hospital serve many people from the rural here, and because health workers here know the patients personally, some patients may want to consistently spend time talking, but the health workers try to hurry them, and they perceive this as a bad attitude. However, we are encouraging our staff to be accommodative to such patients" (HM2).*

> *"Due to the short operating hours here, our staff may not be able to entertain all the patients, especially to avoid delays. But you know how it is, ANC clinic is complicated, issues of poor attitude always come up" (KM4).*

After the intervention in Homabay County, the hospital managers have also applauded the effectiveness of the intervention in improving staff attitude rating by ANC clients. The following are excerpts from the managers.

> *"I am impressed with just what has happened in a short time. Despite the uncertainties of the pandemic, many mothers are reporting that nurses here are very compassionate and friendly" (HM2).*

The findings are also in agreement with those of Dean, *et al*., (2012) that documented that human resources for health play an integral role in adherence to appointments in medical facilities. In addition, patients still tend to miss appointments in cases where the health workers are not receptive to them in terms of attitude and perceptive harassment. The study also found out that missed

appointments can be attributed to human resources for health in many aspects such as their numbers, competency level, responsiveness, and attitude towards patients. The study findings also concur with the recommendations of Dean et al. (2012) that in order to reduce missed appointment rates, health workers must be ultimately responsive and receptive to patients. The study findings have proven that where health workers are not responsive, and exhibit unfriendly attitude, majority of ANC clients tend to miss their appointments.

Results from the binary logistic regression analysis run between access factors (opportunity cost and facility location) and adherence to appointments (missed appointments) showed that independent variables have a positive impact on the dependent variable. Table 4.28 below shows a summary of these results.

Table 4.28

Logistic regression between access factors and appointment adherence

Logistic regression of access factors							
						95% C.I. for AOR	
	Variables	Category	B	Sig.	AOR	Lower	Upper
Step 1[b]	Opportunity cost	Satisfied	0.343	0.049	1.502	0.142	3.201
		Dissatisfied	0.251	0.043	0.012	1.291	4.141
	Facility location	Satisfied	0.178	0.037	2.612	1.103	4.301
		Dissatisfied	0.421	0.044	0.200	1.154	4.334
		Constant	-2.758	0.002	0.723		

a. Variable(s) entered on step 1: satisfaction with opportunity cost, satisfaction with facility location.

Logistic Regression Equation

$$P(Y_i) = \frac{1}{1 + e^{-(b_0 + b_1 X_{1i})}}$$

where

- $P(Y_i)$ is the predicted probability that Y is true for case i;
- e is a mathematical constant of roughly 2.72;
- b_0 is a constant estimated from the data;
- b_1 is a b-coefficient estimated from the data;
- X_i is the observed score on variable X for case i.

From the logistic regression model, satisfaction with opportunity cost has an adjusted odds ratio of 1.502, indicating that an increase in satisfaction with facility location by one unit increases the chances of adhering to appointments by 1.502 provided all other factors are held constant. In addition, satisfaction with opportunity cost has a p-value of 0.049, showing a significant relationship with missed appointments. Also, dissatisfaction with opportunity cost has an adjusted odds ratio of 0.012, showing that chances of adhering to appointments only increases by 0.012 when a client is dissatisfied by the opportunity cost of seeking services. Additionally, satisfaction with facility location has an adjusted odds ratio of 2.612, indicating that an increase in satisfaction with facility location by one unit increases chances of adhering to appointments by 2.612 provided all other factors are held constant. Also, satisfaction with facility location has a p-value of 0.037, showing a significant relationship with missed appointments. However, dissatisfaction with facility distance has an adjusted odds ratio of 0.200, which infers that when a client is dissatisfied with the facility location, the chances of adhering to appointments only increases by 0.200 provided all factors are held constant.

From the odds ratio analysis for Intervention group, the likelihood of a client missing an appointment when satisfied with the opportunity cost of seeking services is 55% less with an odds ratio of 0.451(CI of 0.055 lower bound and 0.432 upper bound and a p-value <0.05). The likelihood of a client missing an appointment when satisfied with the facility location is also 65% less with an odds ratio of 0.352 (CI of 0.097 lower bound and 0.354 upper bound and a p-value <0.05).

In Control group, odds ratio analysis shows that the likelihood of a client missing an appointment when satisfied with the opportunity cost of seeking services is 64% less with an odds ratio of 0.365 (CI of 0.243 lower bound and 0.663 upper bound and a p-value <0.05). The likelihood of a client missing an appointment when satisfied with the facility location is also 67% less with an odds ratio of 0.333 (CI of 0.201 lower bound and 0.553 upper bound and a p-value <0.05). Table 4.29 shows a summary of these findings.

Table 4.29

Odds ratio analysis between access factors and appointment adherence

Risk Estimate				
			95% Confidence Interval	
Medical facility		Value	Lower	Upper
Intervention County Hospital	Satisfaction with opportunity cost= satisfied	.451	.055	.432
	N of Valid Cases	70		
Control group	Satisfaction with opportunity cost= satisfied	.365	.243	.663
	N of Valid Cases	60		
Intervention County Hospital	Satisfaction with facility location = satisfied	.352	.097	.354
	N of Valid Cases	70		
Control group	Satisfaction with facility location = satisfied	.333	.201	.553
	N of Valid Cases	60		

A Pearson Chi-Square test done between access factors (opportunity cost and facility location) and adherence to appointments (missed appointment) show a significant relationship. Table 4.30 shows a summary of these results.

Table 4.30

Pearson Chi-Square test between access factors and appointment adherence

Chi-Square Tests				
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	42.362[a]	2	0.000	0.000
Likelihood Ratio	45.323	2	0.000	0.000
Fisher's Exact Test	41.132	2	0.000	0.000
N of Valid Cases	126			

Based on the Chi-Square test above, the Pearson Chi-Square = 42.362, degree of freedom = 2, and p value = 0.000. Also, the likelihood ratio = 45.323, degree of freedom =2, and p value =0.000. This shows that there is a significant relationship between access factors and adherence to appointments. Therefore, the study concludes that access factors influence adherence to appointments.

The findings above demonstrate that opportunity cost of seeking ANC services contributes significantly to adherence to ANC appointments. Moreover, the managers confirm that they have had a lot of concerns from their patients that coming to spend the entire day in the hospital instead of fending for family is not sensible all the time. The following excerpts from two managers confirm

this.

> *"Homabay County has a high poverty index, and most mothers often say they rather go to their business than come here for the services. However, we have had many community health workers trying to educate our mothers on the significance of ANCs, and we are seeing an improvement" (HM1).*

> *"Even though we serve many people around the CBD, many people in Kisumu County still live below the poverty line, and many of them prefer to go working than come here for the services" (KM3)*

These findings are justified by hospital managers in both facilities. All the managers agree that proximity to the facility has led to numerous missed appointments as supported by two mangers below:

> *"If you know the history of Homabay County hospital, it has been serving people across the former Intervention district, and many people travel for up to one hour to come here. A lot of our mothers say that the distance is a problem and making them ignore the appointments. However, devolution of health services is slowly addressing this issue" (HM2).*

> *"Distance to facility is not a major issue in Kisumu county hospital because of the location in the CBD. However, because many people prefer to seek services here, some people travel for up to 45 minutes to come here, and sometimes end up missing scheduled appointments" (KM4).*

The findings above agree with those of Oppenheimer (2013) which stipulates that availability of

services does not guarantee that they will be optimally utilized by the patients, and that while MCH services are readily available and affordable, opportunity cost of accessing the services and facility location still impair access. Kazi et al. (2018) also agree that there is bound to be a high rate of missed appointments in the medical facilities where the opportunity cost is high, or the patients have to travel for longer hours. These findings are in coherence with the results of the study as demonstrated in the findings above.

From the binary logistic regression analysis run between patient factors (age and income level) and adherence to appointments (missed appointments), the results showed that independent variables have a positive impact on the dependent variable. Table 4.31 below shows a summary of these results.

Table 4.31

Logistic regression analysis between patient characteristics and appointment adherence

Patient characteristics logistic regression							
						95% C.I. for AOR	
	Variable	Category	B	Sig.	AOR	Lower	Upper
Step 1[a]	Patient characteristics	Age	-0.054	0.031	0.947	0.437	2.053
		Satisfaction with income level	1.641	0.000	5.159	2.487	10.704
		Constant	-5.665	0.000	0.003		
a. Variable(s) entered on step 1: age of the respondent, what is your income level.							

Adopted Logistic Regression Equation

$$P(Y_i) = \frac{1}{1 + e^{-(b_0 + b_1 X_{1i})}}$$

where

- $P(Y_i)$ is the predicted probability that Y is true for case i;
- e is a mathematical constant of roughly 2.72;
- b_0 is a constant estimated from the data;
- b_1 is a b-coefficient estimated from the data;
- X_i is the observed score on variable X for case i.

From the logistic regression model, age has an adjusted odds ratio of 0.947, indicating that an increase in age by one unit will increase the chances of adhering to appointments by 0.947 provided all other factors are held constant. In addition, age has a p-value of 0.031, showing a significant relationship with missed appointments. Also, satisfaction with income level has an adjusted odds ratio of 5.159, indicating that an increase in satisfaction with income level by one unit will increase the chances of adhering to appointments by 5.159 provided all other factors are held constant. In addition, satisfaction with income level has a p-value of 0.000, showing a significant relationship with missed appointments.

From the odds ratio analysis for Intervention group, the likelihood of a client with a high income missing an appointment is 61% less with an odds ratio of 0.390 (CI of 0.087 lower bound and 0.272 upper bound and a p-value <0.05). The likelihood of an older client missing an appointment is also

54% less with an odds ratio of 0.467 (CI of 0.155 lower bound and 0.371 upper bound and a p-value <0.05).

In Control group, odds ratio analysis shows that the likelihood of a client with a high income missing an appointment is 78% less with an odds ratio of 0.221(CI of 0.152 lower bound and 0.445 upper bound and a p-value <0.05). The likelihood of an older client missing an appointment is also 89% less with an odds ratio of 0.115 (CI of 0.105 lower bound and 0.447 upper bound and a p-value <0.05). The following table 4.32 shows a summary of these findings.

Table 4.32

Odds ratio analysis between patient characteristics and appointment adherence

Risk Estimate				
			95% Confidence Interval	
Medical facility		Value	Lower	Upper
Intervention group	Income level= high	.390	.087	.272
	N of Valid Cases	70		
Control group	Income level= high	.221	.152	.445
	N of Valid Cases	60		
Intervention group	Age =older	.467	.155	.371
	N of Valid Cases	70		
Control group	Age = older	.115	.105	.447
	N of Valid Cases	60		

A Pearson Chi-Square test done between patient factors (age and income) and adherence to appointments show a significant relationship. Table 4.33 shows a summary of these results.

Table 4.33

Pearson Chi-Square test between patient factors and appointment adherence

Chi-Square Tests				
	Value	Df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	36.521[a]	1	0.000	0.000
Likelihood Ratio	47.201	1	0.000	0.000
Fisher's Exact Test	38.170	1	0.000	0.000
N of Valid Cases	126			

Based on the Chi-Square test above, the Pearson Chi-Square = 36.521, degree of freedom = 1, and p value = 0.000. Also, the likelihood ratio = 47.201, degree of freedom =1, and p value =0.000. This shows that there is a significant relationship between patient factors and adherence to appointments. Therefore, the study concludes that patient factors influence adherence to appointments.

The findings above show that age of ANC clients contributes significantly to adherence to ANC appointments. Hospital managers concur that most appointments are missed by younger mothers. The following are excerpts from two managers.

> *"In Homabay county, we established that most of the ANC appointments are missed by young mothers. Older mothers who miss appointments are those carrying the second or more pregnancies" (HM2).*

> *"Even though most mothers we serve here are above 20 years old, most appointments are missed by young women. It is difficult to find old mothers missing appointments unless they have to" (KM3).*

All managers agree that socioeconomic factors directly influence adherence to ANC appointments. The following are excerpts from two managers.

> *"As I mentioned earlier, poverty is a problem in Homabay County, and because many people try to feed their families, it is the reason those with high income level hardly miss appointments. Also, those with support systems such as a spouse do not miss appointments often" (HM1).*

> *"You know people who are unemployed, especially those with very little income are the ones who miss most appointments here. Let me tell you, if you ask around, single or widowed women miss appointments a lot, and not because they choose to, but mostly because they are busy trying to support their children" (KM4).*

The findings above agree with those of Prasad and Anand (2012) that missed appointments are directly associated with patient characteristics such as age, marital status, social status, and income level. Gengiah et al. (2014) asserted that more married women, and people with high income level tend to honor their appointments compared to their counter parts with no income. Gengiah et al.(2014) also reported similar findings that patient characteristics if not addressed appropriately would result into high missed appointments in medical setting. These results are in coherence with the findings of the study as reported above.

4.9 Effect of system-wide communication on adherence to appointments in antenatal clinics

Descriptive analyses were done on the intervening variable (communication) indicators (phone reminders and training) against the dependent variable (adherence to appointments) indicator (missed appointments). It was established that communication to both healthcare workers and ANC clients showed a positive effect on the dependent variable, adherence to appointments. The more the communication was done through phone reminders, the higher the adherence to appointments (the lower the missed appointments). From the intervention, it was evident that consistent communication in form of training and reminders reduced the number of missed appointments.

The above findings are in concurrence with those of Perron et al. (2013) who asserted that phone reminders are effective in reducing missed appointment rates. A study done in Kenya by Dustin et al. (2017) to improve immunization also reported that SMS reminders help individuals who support to remember an appointment and adhere to it. Hardy (2017) also reported that when staff trainings are key in communication and addressing customer needs, and that customers are likely to seek more services where they feel staff understand their needs. Ward et al. (2017) also argues that the manner in which staff communicates with the customer is likely to affect their relationship which in turn affects service uptake.

The multivariate logistic regression model is better without the moderator than with the moderator. For example, the model with the moderator has a higher -2 Log likelihood value (61.082^{a}) compared to the model without the moderator (19.095^{a}). A multivariate logistic regression shows that all the independent variables have a positive impact on the dependent variable. For example, contribution of health workers is significant in strengthening adherence to appointments, that is, when ANC clients

are satisfied with staff attitude and staff responsiveness, then the chances of adhering to appointments increases by 1.383 and 2.006 respectively. When ANC clients are satisfied with waiting time and consultation process, then the chances of adhering to appointments increases by 1.406 and 2.083 respectively. When ANC clients are satisfied with opportunity cost and facility location, then the chances of adhering to appointments increases by 1.502 and 2.612 respectively. The older the ANC clients get and the higher the income, then the chances of adhering to appointments increases by 0.947 and 5.159 respectively. A summary of these results is shown in table 4.34.

Table 4.34

Multivariate Logistic analysis of independent variables and dependent variable.

	Variables	Category	B	Sig.	AOR	95% C.I. for AOR Lower	Upper
Step 1[a]	Waiting time	Satisfied	0.340	0.018	1.406	0.617	3.203
		Dissatisfied	0.250	0.030	0.006	0.412	2.701
	Consultation process	Satisfied	0.734	0.036	2.083	1.051	4.131
		Dissatisfied	0.531	0.027	0.059	1.078	3.251
		Constant	-3.454	0.002	0.032		
	Staff responsiveness	Satisfied	0.421	0.021	2.006	0.516	3.503
		Dissatisfied	0.530	0.035	0.005	1.046	4.303
	Staff attitude	Satisfied	0.824	0.042	1.383	1.087	5.231
		Dissatisfied	0.597	0.038	0.010	1.641	5.671
		Constant	-5.433	0.001	0.534		
	Opportunity cost	Satisfied	0.343	0.049	1.502	0.142	3.201
		Dissatisfied	0.251	0.043	0.012	1.291	4.141
	Facility location	Satisfied	0.178	0.037	2.612	1.103	4.301
		Dissatisfied	0.421	0.044	0.200	1.154	4.334
		Constant	-2.758	0.002	0.723		
	Patient factors	Age	-0.054	0.031	0.947	0.437	2.053
		Satisfaction with income level	1.641	0.000	5.159	2.487	10.704
		Constant	-5.665	0.000	0.003		

a. Variable(s) entered on step 1: waiting time, consultation process, staff responsiveness, staff attitude, opportunity cost, facility location, age, income level.

Multivariate Logistic Regression Equation:

$$P(Y_i) = \frac{1}{1 + e^{-(b_0 + b_1 X_{1i} + b_2 X_{2i} + ... + b_k X_{ki})}}$$

where

- $P(Y_i)$ is the predicted probability that Y is true for case i;
- e is a mathematical constant of roughly 2.72;
- b_0 is a constant estimated from the data;
- b_1, b_2, ... ,b_k are the b-coefficient for predictors 1, 2, ... ,k;
- X_{1i}, X_{2i}, ... ,X_{ki} are observed scores on predictors X_1, X_2, ... ,X_k for case i.

In summary, based on the multivariate logistic equation above, any positive increase in any independent variable leads to an increase in dependent variable. That is, satisfaction with any one independent variable leads to an increase in adherence to appointments. The moderating variable has a multiplier effect on the independent variables, hence increases adherence to appointments.

The study noted that most interventions are fragmented and implemented in isolation, focusing on individual aspects of health system. The study also established that interventions that do not focus on the entire system do not yield a sustainable result. For example, focusing on health workers or patients alone may not positively influence adherence to appointments. The study employed a systematic approach intervention that focused on health workers, organization of MCH services, and patients, which ensured that the desired outcome was achieved. The study employed a combination of both patient reminders and training which yielded stronger effect on adherence to appointments.

4.7 Conclusion

Organization of MCH services in both Intervention group and Control group is poor. This is evident in the amount of patient waiting time in the two counties, which is affecting adherence to ANC appointments. In Intervention group majority 26 (37.1%) wait for 60 or more minutes to see a health care provider during an appointment, and in Control group, majority of ANC clients 20 (33%) wait for 60 or more minutes. Due to this amount of waiting time, majority of ANC clients in Intervention group, 35 (50%) are very dissatisfied with the waiting time and in Control group majority, 20 (33%) are very dissatisfied. Also, 55 (78.6%) in Intervention group have missed their ANC appointments at some point because of the waiting time. 35 (58%) in Control group have missed their ANC appointments at some point because of the waiting time. The consultation process is also an issue as majority 40 (57.1%) are dissatisfied with the process in Intervention group. 28 (46%) are dissatisfied with the process in Control group. The hours of operation are also limiting adherence to ANC appointments because, for example, in Intervention group, 40 (57.1%) are very dissatisfied with operating hours of the ANC clinic. The same situation is in Control group 30 (50%) are dissatisfied with operating hours of the ANC clinic. In addition, majority 55 (78.6%) ANC clients stated that they have at one point missed their appointments due to the facility operating hours in Intervention group. 30 (50%) ANC clients stated that they have at one point missed their appointments due to the facility operating hours in Control group. From the logistic regression analysis, satisfaction with waiting time and consultation process has an adjusted ratio of 1.406 and 2.083 respectively. This means that when ANC clients are satisfied with waiting time and consultation process, then the chances of adhering to appointments increases by 1.406 and 2.083 respectively. From Odds ratio analysis, the likelihood of a client missing an appointment when satisfied with waiting time is 72% less with an odds ratio of

0.281 (CI of 0.135 lower bound and 0.500 upper bound and a p-value of 0.018). The likelihood of a client missing an appointment when satisfied with consultation process is 54% less with an odds ratio of 0.462 (CI of 0.355 lower bound and 0.600 upper bound and a p-value of 0.036).

Health workers also contribute significantly to adherence to ANC appointments. The study findings show that staff responsiveness is also poor in both the facilities as majority 55 (78.6%) ANC clients in Intervention group reported being dissatisfied with the way staff respond to their needs, with 20 (33%) ANC clients in Control group also saying they are dissatisfied with staff responsiveness towards their needs. 50 (71.4%) in Intervention group Control group confirmed that the lack of responsiveness has contributed to their missing appointments before. 20 (33%) in Control group confirmed that the lack of responsiveness has contributed to their missing appointments before. Staff attitude also came up as an issue in ANC clinics as majority, 40 (57.1%) of ANC client in Intervention group reported that they were dissatisfied with the kind of attitude the health workers are exhibiting during service delivery. 30 (50%) of ANC client in Control group reported that they were dissatisfied with the kind of attitude the health workers are exhibiting during service delivery. In addition, in Intervention group majority, 50 (71.4%) confirmed that they have at one point missed their ANC appointment because of the attitude of health workers during service delivery. 28 (46%) in Control group confirmed that they have at one point missed their ANC appointment because of the attitude of health workers during service delivery. From the logistic regression analysis, satisfaction with staff responsiveness and staff attitude has an adjusted odds ratio of 1.383 and 2.006, respectively. This infers that when ANC clients are satisfied with staff attitude and staff responsiveness, then the chances of adhering to appointments increases by 1.383 and 2.006 respectively. From Odds ratio analysis, the likelihood of a client missing an appointment when satisfied with staff responsiveness

is 85% less with an odds ratio of 0.154 (CI of 0.087 lower bound and 0.272 upper bound and a p-value of 0.021). The likelihood of a client missing an appointment when satisfied with staff attitude is also 89% less with an odds ratio of 0.115 (CI of 0.046 lower bound and 0.152 upper bound and a p-value of 0.042).

Issues of access to ANC services such as opportunity cost are also prevalent in hindering adherence to appointments. For example, the study has reported that 50 (71.4%) of ANC clients find the opportunity cost of seeking ANC services high in Intervention group. 20 (33%) of ANC clients find the opportunity cost of seeking ANC services high in Control group. In fact, in Intervention group, majority, 55 (78.6%) reported that they have ever their missed appointment because of the opportunity cost, while half, 30 (50%) in Control group said they have ever missed their ANC appointments because of the cost of seeking those services. Facility location also contributes to adherence to appointment. For instance, majority 35 (50%) ANC clients in Intervention group reported that they are dissatisfied with the distance to the facility. 36 (60%) ANC clients in Control group reported that they are dissatisfied with the distance to the facility. In addition, 55 (78.6%) in Intervention group reported that they have ever missed their appointments because of facility location. 24 (40%) in Control group reported that they have ever missed their appointments because of facility location. From logistic regression analysis, satisfaction with opportunity cost and facility location has an adjusted odds ratio of 1.502 and 2.612 respectively. This infers that when ANC clients are satisfied with opportunity cost and facility location, then the chances of adhering to appointments increases by 1.502 and 2.612 respectively. From Odds ratio analysis, the likelihood of a client missing an appointment when satisfied with the opportunity cost of seeking services is 55% less with an odds ratio of 0.451(CI of 0.055 lower bound and 0.432 upper bound and a p-value of 0.049). The likelihood

of a client missing an appointment when satisfied with the facility location is also 65% less with an odds ratio of 0.352 (CI of 0.097 lower bound and 0.354 upper bound and a p-value of 0.037).

The study has also associated patient characteristics with adherence to appointments in ANC clinics. The study has demonstrated that the younger the ANC client, the more likely that they will miss their ANC appointment as majority who missed appointments before were below the age of 32. Therefore, young mothers tend to miss more appointments compared to the elder mothers. Also, married respondents tend to honor ANC appointments more than other respondents with other marital statuses. Additionally, people with low-income level miss more appointments compared to their counterparts in high income brackets. From the logistic regression analysis, age and income has an adjusted odds ratio of 0.947 and 5.159 respectively. This means that the older the ANC clients get and the higher the income, then the chances of adhering to appointments increases by 0.947 and 5.159 respectively. From Odds ratio analysis, the likelihood of an older client missing an appointment is also 54% less with an odds ratio of 0.467 (CI of 0.155 lower bound and 0.371 upper bound and a p-value of 0.031). The likelihood of a client with a high income missing an appointment is 61% less with an odds ratio of 0.390 (CI of 0.087 lower bound and 0.272 upper bound and a p-value of 0.000).

The health system approach intervention, done through a system-wide communication saw a significant improvement in the variables where it was applied. The intervention significantly improved the organization of MCH services in Intervention group. This is evident in the significant reduction of patient waiting time in which majority 40 (60.6%) now wait up to just 30 minutes to receive care, with everyone else waiting a maximum of 45 minutes. 38 (57.6%) have also reported their satisfaction with the waiting time. Due to this reduction in the amount of waiting time, missed

appointments associated with waiting time have also declined to 6 (9.1%). The consultation process has also been improved by the intervention in Intervention group. Majority 43 (65.2%) reported their satisfaction with the consultation process. 44 (66.7%) reported their satisfaction with the duration of consultation. The intervention also increased hours of operation by three hours which saw a total decline in missed appointments associated with operating hours. There were no significant changes in Control group where no intervention was done. The intervention also significantly strengthened both staff attitude and staff responsiveness in Intervention group. After the intervention, satisfaction with staff responsiveness improved to 51 (77.3%) among ANC clients. Moreover, the number of missed appointments associated with poor staff responsiveness reduced significantly, with only 9 (13.6%) reporting having missed any appointments before as a result of staff responsiveness. The intervention also saw a great improvement in staff attitude in Intervention group. Majority, 50 (75.8%) said they are satisfied with staff attitude during service delivery, and only 14 (21.2%) stating that they have missed appointments before because of staff attitude. With no intervention in Control group, no significant changes have been observed. From the logistic regression, patient reminders and staff training has an adjusted odds ratio of 2.000 and 1.591 respectively. This means that an increase in number of patient reminders by one unit will increase the chances of adhering to appointment by 2.000 provided all other factors are held constant. Also, an increase in number of training by one unit will increase the chances of adhering to appointment by 1.591 provided all other factors are held constant.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The summary of the findings, conclusions, and the recommendations on the study as well as recommendations for further research are presented in this chapter.

5.2 Summary of the Findings

Organization of MCH services in Intervention group and Control groups is inadequate and is affecting adherence to appointments in ANC clinics in the hospitals. Based on the findings and discussions presented above, it is evident that there is a need for an intervention in the manner in which organization of MCH services is done in the two counties, particularly on the basis of patient waiting time and consultation process. In both Intervention group and Control group, all ANC clients wait at least 30 minutes on a queue before being served. However, majority 26 (37.1%) of ANC clients wait for at least 60 minutes in Intervention County. 24 (40%) of ANC clients wait for at least 60 minutes in Control group. This infers that the two county facilities have long patient waiting time that requires attention. In addition, majority 35 (50%) and 24 (40%) of ANC clients in Intervention group expressed that they were very dissatisfied and dissatisfied with the long waiting time. 25 (35.7%) and 16 (26%) of ANC clients in Control group expressed that they were very dissatisfied and dissatisfied with the long waiting time. The dissatisfaction with the waiting time has also affected adherence to appointments greatly. Majority of ANC clients 55 (78.6%) in Intervention group and Control group, respectively, stated that they have missed their ANC appointments at some point because of the amount of time they take to see a health care provider. 35 (58%) in Control group stated that they have missed their ANC appointments

at some point because of the amount of time they take to see a health care provider. The findings also show that consultation process hampers adherence to appointments in ANC clinics. For example, majority, 45 (64.3%) of ANC clients are dissatisfied with the privacy during consultation in Intervention group. 32 (54%) of ANC clients are dissatisfied with the privacy during consultation Control group. The facilities are also not giving ANC clients enough time during consultation to express their needs as 40 (57%) and 31(52%) expressed dissatisfaction with the consultation duration in Intervention group and Control group, respectively. ANC clients, therefore, do not feel satisfied and opt to miss appointments. Even general cleanliness has been reported poor in the two hospitals, as majority of ANC clients, 55 (78.6%) and 34 (56%) are dissatisfied with the general cleanliness of the facilities, including toilets, in Intervention group and Control group, respectively. This has also led to a great deal of missed appointments since majority, 55 (78.6%) and 32 (54%) of ANC clients in Intervention group and Control group respectively reported that they had missed their ANC appointments in the past due to their dissatisfaction with the level of cleanliness in the facilities, with toilets remaining the major spot of reference. With these statistics, it can be reported that majority, 30 (42%) and 36 (60%) of ANC clients in Intervention group and Control group are very dissatisfied and dissatisfied with the services they receive, respectively. The working hours of the two facilities are also hindering full adherence to appointments. With both facilities restricting operating hours for ANC clinics to just afternoon, 40 (57.1%) and 30 (50%) of ANC clients report that they are very dissatisfied with operating hours of the ANC clinic. Additionally, due to the limited operating hours of the clinic, majority, 55 (78.6%) and 30 (50%) ANC clients have, at one point or another, missed their appointments due to the facility operating hours in Intervention group and Control group, respectively. With these findings, consultation process should, therefore, be improved in both

facilities. In fact, majority, 40 (57.1%) and 33 (56%) of ANC clients reportedtheir dissatisfaction with the entire consultation process. Organization of MCH services (independent variable) also have a p value <0.05 based on the Pearson correlation, indicating a strong association and high significance to adherence to appointment (dependent variable). Pearson Chi-Square test run between organization of MCH services (patient waiting time, consultation process) and appointment adherence (missed appointment) depicted a significant relationship between the variables. Based on the Chi-Square test shown in table 4.13, the Pearson Chi-Square = 52.632, degree of freedom = 2, and p value = 0.000. Also, the likelihood ratio = 53.232, degree of freedom =2, and p value =0.000. This shows that there is a significant relationship between organization of MCH services and adherence to appointments. Hence, the study concludes that organization of MCH services influences adherence to appointments. Therefore, an intervention on organization of MCH services was appropriate to improve adherence to appointments in ANC clinics in Intervention group and Control group.

Health care workers plays an integral role on adherence to appointments in ANC clinics in terms of their responsiveness to the needs of the ANC clients and their attitude during service delivery. Based on the findings of the study presented in the previous chapter, it is evident that there is need to intervene on the way health workers respond to the needs ofthe ANC clients, and their attitude towards the ANC clients as they deliver the services. This is depicted in by ANC clients in Intervention group where majority 55 (78.6%) reported that they are dissatisfied with the way staff respond to their health needs. Even though majority 36 (60%) of ANC clients in Control group showed satisfaction with staff responsiveness towards their health needs, the same number expressed their dissatisfaction with the consistency of service delivery, where they are hardly

served by the same health care worker. This infers that each time they visit the facility, they have to encounter a new health care provider. For example, in Intervention group 35 (50%) of the ANC clients are rarely served with the same health worker every time they visit the facility for ANC services, with another 35 (50%) clarifying that it is only sometimes that they are served with the same health worker. In Control group about 12 (20%) are rarely served with the same health worker, with majority 48 (80%) stating that it is only sometimes that they see the same health worker when they visit the facility. Due to these findings, adherence to appointments in ANC clinics is affected because 50 (71.4%) and 24 (40%) of ANC clients have ever missed their ANC appointments because of the lack of such inconsistencies in in Intervention group and Control group respectively, and this is due to having to express your health needs in every visit to a new health care worker. Staff attitude towards ANC clients during service delivery also affects adherence to appointments. Majority, 40 (57.1%) and 30 (50%) of ANC client in Intervention group and Control group are dissatisfied with the attitude the health workers exhibit during service delivery. In fact, majority, 40 (57.1%) and 26 (44%) of ANC client find the health workers unfriendly, with another 15 (21.4) and 12 (20%) complaining that the staff are rude in Intervention group and Control group, respectively. ANC clients are also missing their appointments because of the attitude displayed by the staff. In fact, in Intervention group and Control group, majority, 50 (71.4%) and 34 (56%) confirm that they have at one point missed their ANC appointment because of the attitude of health workers during service delivery, respectively. It is, therefore, important to foster good relations and better attitude to encourage ANC clients to adhere to their appointments. The health workers factors variables (independent variable) also have a p value <0.05 based on the Pearson correlation, indicating a strong association and high significance to adherence to appointment (dependent variable). It can, therefore, be concluded

that health workers factors directly influence adherence to appointments. A Pearson Chi-Square test done between health workers factors (staff responsiveness and staff attitude) and adherence to appointments show a significant relationship. Based on the Chi-Square test shown in table 4.20, the Pearson Chi-Square = 26.721, degree of freedom = 1, and p value = 0.000. Also, the likelihood ratio = 36.201, degree of freedom =1, and p value =0.000. This shows that there is a significant relationship between health workers factors and adherence to appointments. Therefore, the study concludes that health workers factors influences adherence to appointments. An intervention on health workers' responsiveness and attitude, therefore, was in order if adherence to appointments in ANC clinics in Intervention group and Control group were to improve.

Accessibility to ANC services influences adherence to appointments in ANC clinics. Even though access to ANC services in terms of affordability is not a deterrent because the services are mostly free, opportunity cost and proximity to the facility remains a challenge. Based on the findings and discussions presented in the previous chapter, opportunity cost and facility location are a deterrent to adherence to appointments in ANC clinics. Both Intervention and Control Counties have a high level of poverty of just about 50.3%. This infers that most time is dedicated to feeding families with limited preference given to attending appointments. Besides, majority, 50 (71.4%) and 24 (40%) of ANC clients reported that the opportunity cost of attending ANC appointments is high in Intervention group and Control group, respectively. In fact, 20 (28.6%) and 12 (20%) in Intervention and Control affirmed that they would possibly not forgo their work to attend ANC appointment. This shows that the opportunity cost is impairing adherence to ANC appointments. In addition, majority, 55 (78.6%) and 30(50%) of ANC clients have ever missed their appointment

because of the opportunity cost in Intervention group and Control group, respectively. Facility location has also been depicted in the findings as a major factor deterring adherence to appointments. ANC clients who are not in close proximity to the hospitals miss more appointments than their counter parts within a close proximity to the facility. While both Intervention group and Control group are situated with the central business district of the town, many health care seekers live in the rural outskirt of the municipality. For example, 10 (14.3%) and 24 (40%) of ANC clients in Intervention and Control travel for at least 60 minutes to get to the facility respectively, with 35 (50%) and 24 (40%) reporting dissatisfaction with the duration of travel to the facility. This dissatisfaction proximity to the facility creates avenue for missed appointments as 55 (78.6%) and 24 (40%) of ANC clients in Intervention and Control groups revealing that they have ever missed their ANC appointments because of the facility location. These findings show that facility location and opportunity cost affect adherence to appointments in ANC clinics. The regression result also shows that access to ANC services directly affect adherence to appointments. In addition, the access factors variables (independent variable) also have a p value <0.05 based on the Pearson correlation, indicating a strong association and high significance to adherence to appointment (dependent variable). A Pearson Chi-Square test done between access factors (opportunity cost and facility location) and adherence to appointments show a significant relationship. Based on the Chi-Square test in table 4.27, the Pearson Chi-Square = 42.362, degree of freedom = 2, and p value = 0.000. Also, the likelihood ratio = 45.323, degree of freedom =2, and p value =0.000. This shows that there is a significant relationship between access factors and adherence to appointments. Therefore, the study concludes that access factors influences adherence to appointments. It can, therefore, be ascertained that an intervention on factors of accessibility to ANC services would translate to an improved adherence to appointments in ANC clinics.

Patient characteristics directly influence adherence to appointments in ANC clinics. The findings and discussions presented in the previous chapters shows that age and socioeconomic factors have a significant effect on adherence to ANC appointments in both Intervention and Control groups. Even though majority of ANC clients in both Intervention and Control Counties are between the age of 28 and 32 years, most appointments are missed by young mothers of between 18 and 27. The findings have also revealed that mothers of between 33 and above tend to adhere to appointments more than their younger counterparts. Majority, 59 (84.3%) and 40 (67%) %) in Intervention group and Control group reported that they have missed their ANC appointments before for other reasons including but not limited to forgetfulness and the fear of corona virus in the hospitals. This demonstrate that missed appointments can be limited by various interventions including just sending reminders to ANC clients and taking precautions and guidelines on curbing the spread of corona virus stipulated by the ministry of health. It is also interesting to note that about 20 (28.5%) and 24 (40%) of ANC clients in Intervention group and Control group make their first ANC visit at the third month of their pregnancy. With others 10 (14.3%) and 6 (10%) whose first ANC visit were at the fourth month and second month in Intervention group and Control group, respectively. This shows that most mothers do not begin their ANC visits within the first trimester, which is the recommendation of the World Health Organization. The findings have also established that even though majority, 35 (50%) and 24 (40%) of ANC clients in Intervention group and Control group respectively are married, 15 (21.4%) and 12 (20%) are single mothers. This has an impact on adherence as revealed by the study that single and separated ANC clients miss more appointments compared to their married and cohabiting counterparts. Just about 40 (57.1%) and 25 (42%) of ANC clients in Intervention group and Control group are also

not in any formal employment, rendering income levels of the majority, 35 (50%) and 25 (42%) at less than Ksh20000 in Intervention County and Control County, respectively. With this income level, many ANC clients are likely to prefer working to attending ANC appointments. In fact, the study shows that those in lower income bracket tend to miss more of their ANC appointments compared to their counterparts in higher income bracket. These findings have justified that patient characteristics influence adherence to appointments in ANC clinics. In addition, the regression result shows that patient characteristics directly affect adherence to appointments. Patient characteristics (independent variable) also have a p value <0.05 based on the Pearson correlation, indicating a strong association and high significance to adherence to appointment (dependent variable). A Pearson Chi-Square test done between patient factors (age and income) and adherence to appointments show a significant relationship. Based on the Chi-Square test in table 4.33, the Pearson Chi-Square = 36.521, degree of freedom = 1, and p value = 0.000. Also, the likelihood ratio = 47.201, degree of freedom =1, and p value =0.000. This shows that there is a significant relationship between patient factors and adherence to appointments. Therefore, the study concludes that patient factors influence adherence to appointments. Therefore, an intervention on patient characteristics is likely to improve adherence to appointments in ANC clinics.

The health system approach intervention implemented through a system-wide communication brought about significant improvement in the organization of MCH services and health workers factors. For example, after the intervention in Intervention group, all ANC clients now wait up to a maximum of 45 minutes to receive healthcare services. The intervention has significantly reduced the amount of waiting time, and increased satisfaction level of the same to 38 (57.6%).

In addition, missed appointments due to patient waiting time has also declined to 6 (9.1%) in Intervention group. The intervention has also improved the consultation process in Intervention group. For example, satisfaction with the general consultation process has improved to 43 (65.2%), satisfaction with privacy during consultation improved to 40 (60.6%) and satisfaction with consultation duration to 44 (66.7%). Additionally, there were zero missed appointments associated with dissatisfaction with the general cleanliness of the facility. The intervention also improved the quality of services in Intervention group, with majority 50 (75.8%) rating the services as good and showing great satisfaction with them after the intervention. The intervention increased the operating hours of the ANC clinic by three hours raising the satisfaction with the same to 47 (71.2%). In addition, zero missed appointments due to operating hours were reported after the intervention in Intervention group. After the intervention in Intervention group, the satisfaction with staff responsiveness improved to 51 (77.3%) reducing the number of missed appointments associated with staff responsiveness to 9 (13.6%). The intervention has also influenced staff attitude towards ANC clients during service delivery significantly. Majority, 48 (72.7%) of ANC clients in Intervention group now find health workers friendly, with 50 (75.8%) stating that they are satisfied with the attitude of health workers during service delivery. Satisfaction with health worker-patient relationship also improved to 49 (74.2%). Missed appointments associated with staff attitude and the nature of health worker-patient relationship have also reduced to 14 (21.2%) and 13 (19.7%) respectively.

5.3 Conclusion

Organization of MCH services, based on the findings and discussions of the study, directly influence adherence to appointments in ANC clinics in public hospitals. While all ANC clients

wait at least 30 minutes before seeing a health care worker, majority wait up to 60 minutes. The dissatisfaction with this long patient waiting time result into missed appointments in ANC clinics as majority of ANC clients have demonstrated. In addition, there is an inadequate privacy in the consultation rooms, and many ANC clients are not accorded enough time during the process. This results into dissatisfaction with the consultation process in general. ANC clinics in Intervention County and Control groups also operate for limited hours, limiting the quality of services offered, which in turn hamper adherence to the appointments. Additionally, the cleanliness of the facilities is wanting, and this has resulted into missed appointments as illustrated by the ANC clients. An intervention into the organization of MCH services would, therefore, improve adherence to appointments in ANC clinics in public hospitals.

Health care workers significantly contribute to the adherence to appointments in ANC clinics in public hospitals based on the findings and discussions of the study. Based on the arguments of the majority of the ANC clients, health care workers are not responsive enough to their health needs, resulting into missed appointments. In addition, many ANC clients find health workers with an unfriendly attitude, which hinders their efforts to honor ANC appointments in certain occasions. Some health workers are also rude to the ANC clients, straining their relationship. Due to the poor relationship between health workers and ANC clients, and inconsistency in service delivery because of the different health workers serving ANC clients on separate visits, majority miss their appointments. Therefore, intervening on these health workers factors is likely to improve their efforts to contribute positively to the appointment adherence in ANC clinics in public hospitals.

Factors influencing access to ANC services, based on the findings and discussions of the study, directly influence adherence to appointments in ANC clinics in public hospitals. While ANC

services are mostly free in public hospitals, access is still hindered by opportunity cost and proximity to the facility. With majority of ANC clients falling at the bottom of the pyramid with low-income level, many of them find the opportunity cost of adhering to ANC appointments high, and this is particularly because of the high poverty level, up to 50.3%, in Intervention and Control County. Also, some of the ANC clients would rather not leave their work to adhere to their ANC appointments. Notably, the high opportunity cost results into missed appointments in the facilities. Even though Intervention group and Control group are situated within the municipality, many ANC clients residing in the remote areas miss their appointments because of the distance. Proximity to the facilities, therefore, hampers adherence to appointments in ANC clinics in the public hospitals. A possible intervention on access factors would, therefore, result into improved adherence to ANC appointments.

Patient characteristics play a pivotal role in adherence to appointments in ANC clinics in public hospitals based on the findings and discussions of the study. Many ANC clients begin their ANC visits at the beginning of the second trimester in Intervention and Control Counties. Patient factors such as age and socioeconomic factors have an impact on appointment adherence in both Intervention group and Control group. Younger ANC clients miss more appointments than their older counterparts. Notably, single and separated ANC clients miss more appointments compared to their married and cohabiting counterparts. With many unemployed ANC clients in Intervention and Control Counties, there is high missed appointment rates among ANC clients who have lower income levels compared to those who fall under higher income bracket. Therefore, an intervention on patient factors is likely to improve adherence to appointments in ANC clinics in public hospitals.

System wide communication intervention significantly influenced adherence in the intervention group. As evident in the findings after the intervention, patient waiting time can be significantly reduced by simply increasing the number of consultation points. After the intervention in Intervention group, ANC clients now wait up to a maximum of 45 minutes to receive services. The intervention has also significantly improved satisfaction with patient waiting time and reduced missed appointments associated with the amount of waiting time in the facility. Additionally, the intervention has strengthened privacy in the consultation rooms and well as the general consultation process. Quality of services and facility cleanliness have also been improved, bringing missed appointments due to the general cleanliness to zero. Operating hours that limited uptake of ANC services have also been extended totally eliminating missed appointments associated with limited operating hours of ANC clinics. After the intervention in Intervention group, majority of ANC clients found health care workers responsive enough to their health needs, as majority also stated that the staff has become very friendly. This has also reduced missed appointments associated with staff responsiveness, health worker-patient relationships, and staff attitude as stated in the above sections. Factors influencing access to ANC services remain a deterrent to adherence to appointments as the intervention did not apply to them. Much still needs to be done in this area. While no intervention was done on patient characteristics, a decline in missed appointments due to patient factors other than the study matrices reduced significantly. Other patient characteristics continue to affect adherence to appointments, and more health education is still required to improve adherence to appointments in ANC and PNC clinics.

5.4 Recommendations

The recommendations on the research findings and for further research are presented in this section.

5.4.1 Recommendations

1. The Hospital Management Boards together with Homabay and Kisumu County governments should revamp the way MCH services are organized through increasing the number of consultation rooms to limit patient waiting time and considering increasing hours of operation in ANC clinics to accommodate more ANC clients.
2. The Hospital Managers in both Homabay County hospital and Kisumu County hospital should organize for public relations training for health care workers on the best ways to improve the way they respond to client needs and to foster good attitude towards clients.
3. The Homabay and Kisumu County governments together with the national government should devolve more ANC services to the people living in remote areas who cannot access the facilities easily.
4. Community health workers in collaboration with the provincial administrators should educate mothers on the importance of ANC services to improve uptake of the services.
5. The Hospital Management Boards together with Homabay and Kisumu County governments should adopt a health system approach intervention employed in this study to improve adherence to appointments in ANC and PNC clinics.

5.4.2 Recommendations for Further Research

1. The role of telemedicine on uptake of MCH services is recommended as further research. This would provide recommendations on how to provide MCH services to those unable to physically access the facility due to either remote location or busy schedule at work. It would also address issues resulting from coronavirus and other pandemics that may evolve in the future around uptake of MCH services.
2. The effect of patient engagement in uptake of healthcare services is recommended as further research. During the study, it was noticed that most patients are aware of the existence and importance of healthcare services, however, they just want to be engaged in the process.

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APPENDICES
APPENDIX I: INFORMED CONSENT LETTER

Dear Respondents,

RE: SEEKING CONSENT FOR YOUR INCLUSION IN THE STUDY TITLED "EFFECTS OF HEALTH SYSTEM APPROACH INTERVENTION ON ADHERENCE TO APPOINTMENTS IN ANTENATAL AND POSTNATAL CLINICS IN PUBLIC HOSPITALS IN SELECTED COUNTIES IN KENYA"

Introduction

My name is Shadrack Opon, and I am a PhD student at Kenya Methodist University in Kenya. I am seeking your consent to conduct a study in your facility with the title as mentioned in the reference above.

Purpose

The purpose of the study is to reduce missed appointments in antenatal and postnatal clinic, and findings will be used to strengthen health systems in Kenya and other developing countries. The communities and individuals will benefit from improved healthcare services and efficient use of health resources. The proposal is significant as it will be the basis of intervention to reduce missed appoint rates among the respondents.

Procedure

If you choose to participate in this study, I will provide you with a questionnaire that will require your responses to specific questions concerning your medical appointments. You have the right to refuse to answer any or all of the questions without being victimized. I will also access your biographic data including your contact details from the hospital to be able to reach you during the intervention.

Duration

This will be an interventional study that will be done for four months. The first month will be done for baseline data, after which the intervention will continue for four months to determine the impact on reducing missed appointments.

Confidentiality

The study will be private, and names will not be required at any point of the study. The personal details you provide will be kept safe and treated with confidentiality. All the responses will only be used for academic purposes.

Risks

During the four-month duration of the study, you will be contacted at some stage through the contact information you provided for reasons of this study. If you find some of the questions too personal or that creates discomfort or risks with which you are uncomfortable, you may choose not to answer or withdraw from the study at any stage.

Benefits

Participation in this study is voluntary and free of charge. There will be no rewards or bonuses for anyone who chooses to participate in it.

Withdrawal

Remember that this is a voluntary participation, and you are free to withdraw at any stage of the study. You may also ask any questions related to the study prior, during and after the study.

Concerns

In case of any interests, concerns or questions relating to the study, you may contact any of the following supervisors and myself.

1. Dr. Wanja Mwaura 0726678020
2. Dr. Kezia Njoroge 0738970746
3. Shadrack Opon 0724242222

Recruitment and Selection of Subjects

Respondents who will be at the facilities on the day of selection will be randomly selected for inclusion in the study. More respondents will be randomly selected from a list of registered antenatal and postnatal patients scheduled for appointments for at least four months from the date

of inception/baseline. Those whose are below 18 years of age will be excluded. Consent will be requested as stated above.

Narrative Description

This will be a voluntary research with no monetary incentive. The research will involve expectant mothers in their second trimester with antenatal appointments within four months, and mothers with new deliveries. The research do not involve any tests on human subjects. The respondents will be contacted for consent. The objectives of the study will be read to them and translated in a language they understand before asking for consent. The respondents will be informed that their participation will help in strengthening health systems in Kenya, particularly service delivery and health financing. The intervention will generate knowledge that the government can use to make informed decisions about the health system.

Consent

The above statements and requirements of the study have been read to me in a language I understand, and they are clear to me. I have been informed that my participation in this study is voluntary with no rewards whatsoever, and that any information I provide will be kept safe and confidential, and used only for academic purposes. I also understand that I can withdraw from the study at any stage without victimization. I also understand that by signing this form, I agree to participate in the study under the contents of this letter as read to me.

Signature…….. Date...../……/20…..

Investigator's Statement

I, the undersigned, have read and explained to the volunteer respondent, in a language he or she understand, the procedures of the study and the risks as well as the benefits involved.

Name of investigator: Shadrack Opon

Signature……. Date……/……/20/……

APPENDIX II: STRUCTURED QUESTIONNAIRE

To be filled by ANC/PNC Clients

Patient Characteristics

Age (Years)

Are you employed?

Yes ☐ No ☐

What is your income level? (Ksh)

Marital Status

Single ☐ Married ☐ Widow ☐

Separated ☐ Cohabiting ☐

Organization of MCH services

1. Is this your first pregnancy?
   Yes ☐ No ☐
2. Is this your first antenatal visit for this pregnancy?
   Yes ☐ No ☐
3. How long have you been pregnant? (In months)
4. How long did you wait to see the health care provider? (Minutes)
5. How satisfied are you with this waiting time?
   Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐
6. Have you missed your appointment because of waiting time in the last seven months?
   Yes ☐ No ☐

7. Does the hospital have labels on rooms based on service offered?

   Yes ☐ No ☐

8. How satisfied are you with the privacy during consultation?

   Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

9. How satisfied are you with the time given to you by the health service provider?

   Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

10. How satisfied are you with the consultation process in the facility?

    Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

11. How satisfied are with the cleanliness of the hospital, including toilets?

    Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

12. Have you missed your appointment because of the state of cleanliness of the hospital in the last seven months?

    Yes ☐ No ☐

13. How would you rate the quality of services you receive in the hospital?

    Excellent ☐ Good ☐ Fair ☐ Poor ☐

14. How would you describe your overall satisfaction with the service (s) you received?

    Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

15. How satisfied are you with the operating hours of the clinic?

    Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

16. Have you missed your appointment because of the operating hours of the clinic in the last seven months?

    Yes ☐ No ☐

17. How important for you are the ANC services offered in the hospital?

Very Important ☐ Important ☐ Slightly Important ☐ Unimportant ☐

Health Workers Factors

18. How satisfied are you with the responsiveness of healthcare workers towards your need?

Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

19. How satisfied are you with the consistency of service delivery by healthcare workers in the hospital?

Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

20. How frequent do you see or served with the same health worker in the clinic?

Always ☐ Sometimes ☐ Rarely ☐ Never ☐

21. How do you find the attitude of health workers in the hospital?

Very Friendly ☐ Friendly ☐ Not Friendly ☐ Rude ☐

22. How satisfied are you with the health workers' attitude towards you?

Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

23. Have you missed appointment because of the anticipated attitude of health workers in the last seven months?

Yes ☐ No ☐

24. How satisfied are you with your relationship with the health workers in this facility?

Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

25. Have you missed appointments because of the nature of your relationship with the health workers in the last seven months?

Yes ☐ No ☐

Access to Health Care Factors

26. How long do you travel to reach the health facility? (Minutes)

27. How satisfied are you with the distance you walk to get to the facility?

Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

28. Have you missed appointment because of the distance in the last seven months?

Yes ☐ No ☐

29. How would you rate the cost of seeking services in terms of what you forgo or spend to get here?

Very High ☐ High ☐ Average ☐ Low ☐

30. How likely are you to forgo your daily work to come for the services?

Definitely ☐ Probably ☐ Possibly ☐ Possibly Not ☐

31. Have you missed appointments because of the cost of seeking the services in the last seven months?

Yes ☐ No ☐

Appointment Adherence

32. Have you missed any of the appointments in the last seven months?

Yes ☐ No ☐

33. IF YES in your own words, why did you miss the appointment?

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34. In the last seven months, have you been receiving appointments reminders about your scheduled appointments?

Yes ☐ No ☐

APPENDIX III: KEY INFORMANT GUIDE

To be filled by Hospital Heads and Maternity In-charges only

1. Why do you think your patients miss appointments?

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2. What is the average patient waiting time in your facility?

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3. What is your opinion about the responsiveness of health workers to patient needs in your facility?

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4. How consistent are your health workers in providing services to patients?

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5. How do missed appointments affect your facility?

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6. What can you tell us about the influence of patient characteristics in appointment adherence?

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7. What do you think is the influence of facility location in appointment adherence?

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8. What has been the impact of the intervention on adherence to appointments?

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9. How would you rate PNC and ANC appointment adherence after the implementation of the intervention?

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APPENDIX IV: KeMU SERC APPROVAL

APPENDIX V: NACOSTI ETHICAL APPROVAL

APPENDIX VI: COUNTY HEALTH DEPARTMENT APPROVAL