A MODEL TO PROMOTE UTILIZATION OF SKILLED BIRTH ATTENDANCE AMONG WOMEN OF REPRODUCTIVE AGE IN KANDARA SUB-COUNTY, MURANG'A COUNTY - KENYA

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A Model to Promote Utilization of Skilled Birth Attendance among Women of Reproductive age in Kandara Sub-County, Murang'a County - Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

Signature…….Date……..

Daniel Muya Gachathi

This thesis has been submitted for examination with our approval as the University Supervisors.

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DEDICATION

I dedicate this work to my family members for the support they offered during my studies.

ACKNOWLEDGEMENT

I am grateful to Jomo Kenyatta University of Agriculture and Technology (JKUAT) for providing me with the opportunity to pursue my studies. I also extend my appreciation to my supervisors, Dr. Drusilla Makworo and Prof. Catherine Mwenda, for their continuous guidance and support throughout my research journey.

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ACRONYMS AND ABBREVIATIONS

ACI	Agency for Clinical Innovation
ANC	Antenatal Clinic
CARMMA	Campaign for the Accelerated Reduction of Maternal Mortality in Africa
CHA	Community Health Assistant
CHEW	Community Health Extension Worker
CHUs	Community Health Units
CHV	Community Health Volunteer
CWC	Child Welfare Clinic
EDD	Expected Date of Delivery
FGDs	Focused Group Discussions
HBM	Health Belief Model
HIV	Human Immune-Deficiency Virus
IBP	Individual Birth Plan
IMoC	Interim Model of Care
ISO	International Organization for Standardization
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KDHS	Kenya Demographic Health Survey
KII	Key Informant Interview

KNBS	Kenya National Bureau of Statistics
MNCH	Maternal Newborn Child Health.
MOC	Model of Care
NACOSTI	National Commission for Science, Technology and Innovation
RMNCAH	Reproductive, Maternal, Newborn, Child and Adolescent Health
SBA	Skilled Birth Attendant
SDG	Sustainable Development Goals
STHDA	Statistical Toolset for High-Throughput Data Analysis
TBAs	Traditional Birth Attendants
UHC	Universal Health Care
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children's Emergency Fund
WBCA	Women of Reproductive Age
WHO	World Health Organization
WRA	Women of Reproductive Age.

DEFINITION OF OPERATIONAL TERMS

Attitudes A personal inclinations or opinions towards a subject matter, an individual, or group, that may persuade one's reaction negatively or positively

Baseline study The reference point of data regarding an intended audience or situation prior to intervention: In this study it is the client's experiences of skilled delivery services among women of reproductive age in Kandara-Sub-County

Closed-ended questions These are questions that offer respondents with a list of responses from which to respond; fixed-choice questions.

Comparison group This is the group of participants in quasi-experimental study that, for the sake of comparison, does not obtain the intervention given to the treatment. In Comparison, group participants are not randomly assigned to their condition, as would be in true experimental study.

Convenience samples Samples with respondents who are easily accessible by the researcher.

Environmental factors External factors to an individual that can affect one's behavior

Experience These are occurrences that may have happened to people's life that eventually influence their behaviors, believes and how they carry out their day-to-day activities. In this study, it is what women underwent during past deliveries as far as far the utilization of skilled birth attendance services is concerned.

Focus group A technique used in qualitative research where a moderator guides participant through a discussion of a particular topic, where members discuss issues freely.

In-depth interviews A trained interviewer guides an individual through a discussion of a particular topic in qualitative designs

Intrapartum The period from the onset of true labor. Delivery of the baby and ends with delivery of the placenta.

Maternal death Death of a pregnant woman or within 42 days of termination of the pregnancy, from any cause associated to or aggravated by the pregnancy

Model The general design of the strategy for assigning therapies or intervention being studied to participants in a clinical study or its management and not accidentally or incidentally caused.

Model of care The way maternal health services are delivered. It outlines best practice care and services for a person, pregnant mothers progress through the stages of pregnancy and childbirth. It aims to ensure pregnant women get the right care, at the right time, by the right team and in the right place during antenatal, intranatal and immediate postnatal period.

Outcome evaluation Research planned to assess the after-effect of an intervention program.

Outcome The expected effects of the model of care in enhancing the uptake of skilled deliveries (both short term or long-term).

Perception A particular personal attitude towards something. In this study, this refers to women's, views on the utilization of skilled birth attendance services.

Pretesting A type of formative assessment involving systematic amassing intended audience feedback to responses and materials before they are generated in their final outline.

Qualitative research Subjective research involving obtaining reactions and feelings from small numbers of persons during a discussion. The information generated useful for exploring reactions and uncovering more ideas,

Quantitative research Objective research designed to generate information from large number of people by giving them identical questions and a statistical analysis is used to analyze the numerical data generated from the study.

Respondent's factors The socio-demographic characteristics include past experience in hospital delivery.

Skilled birth Delivery that occurs preferably in the health facility and is attended by an approved and trained health worker

Skilled birth attendant An accredited health professional who is well trained on proficiency skills to manage normal pregnancies, delivery of the baby, and the immediate postnatal period and to identify and manage or refer any women and baby who develops a complication

Skilled delivery Model A schematic illustration of strategies to promote uptake of skilled deliveries among women

Strategy This is a long-term plan of action describing resource allocation and activities that help the organization to achieve its goals (Fisher et al., 2020). In this context, strategies are proposed solutions that will help the researcher to come up with a model of care to improve the utilization of skilled birth attendance services in the study area

Women of reproductive age Women aged 15 years to age 49 years – These are commonly referred to as the child-bearing years. It's the ages when females are most fertile and most likely to bear children

ABSTRACT

Globally, over 90% of deliveries in developed countries are attended by skilled health personnel, this indicates a significant high disparity when compared to Sub-Saharan Africa, with only 57% of births occurring in health facilities under the care of a skilled health worker. In Kenya, the percentage of skilled deliveries stands at 89%, but there remains variability within the country. In Murang'a County, the rate of skilled deliveries is at 87% slightly below that of the national, while Kandara Sub-County reports a marked lower figure at 65%. These statistics underscore the ongoing challenges and regional differences in access to skilled maternity care posing significant risks of maternal and neonatal mortality and morbidity. This study aimed to develop a model of care to enhance skilled birth attendance in Kandara Sub-County, Murang'a County, Kenya, where skilled deliveries are at 65% and home deliveries at 35%. It investigated women's experiences, devised strategies, developed a model of care and tested the model's impact. The study comprised two phases: phase 1 was baseline data collection and model development, while phase two involved testing of the developed model. The study utilized community-based approach within structures of community strategy. Descriptive Cross-sectional study design was used where by collection of baseline data involved surveys, interviews, and focus group discussions with a sample size of 347 women,6 women FGDs with 8 participants per group, 6 community health volunteers (CHVs) FGDs with 8 participants per group , 10 KII Community Health Assistants(CHAs) and 7 KII local health administrators' while phase two employed quasi-experimental design (non-equivalent) with 77 participants per wing a total of 154 participants. Quantitative data analysis utilized SPSS, while qualitative data was thematically analyzed using NVIVO. The study adopted the two tailed Z-Test - a statistical test used to determine the difference in utilization of skilled deliveries between the interventional group and the comparison group. The study adopted an alpha of 0.05. Surveys gathered experiences of women in Kandara Sub-County on skilled delivery services. Strategies, including community education and infrastructure improvements, were devised to enhance skilled delivery usage. A validated model of care, addressing demand and supply factors, was developed. After pilot implementation, skilled delivery utilization surged to 98.7%, indicating a 13% increase from the comparison group's 85.7%. Analysis resulted to a z score of 3.08 and a P value of 0.002 resulting in rejection of the null hypothesis. Recommendations: the national and county governments should enhance health facility conditions and staff attitudes through prioritized training by allocating resources for monitoring and engage proficient research teams. The two levels of governments should collaborate on supportive policies, enact legislation to adopt the model of care.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter focused on the background, statement of the problem, justification, significance, research questions, research hypothesis, objectives, study variables, theoretical framework, and the conceptual frame works of the study.

1.2 Background to the Study

The period of labor and delivery is critical for the life of both the mother and the baby and it requires assistance from a competent Skilled Birth Attendant (SBA) and supported by a suitable environment (Edwards, 2020). Environment of delivery is an important element, which affects the health and wellbeing of both the mother and neonate (Edwards, 2020, Feyissa & Genemo, 2014). The health care facilities have a facilitative environment for birth that is eco-friendly to protect, promote and support physiological labor and birth through loving attention of skilled and caring health workers (Hastie, 2020)

The World Health Organization (WHO) defines skilled delivery attendants as midwives, doctors, or nurses who have been trained on skills needed to manage normal pregnancies, normal labor, and the immediate post-natal period and who are capable of identifying, managing, and referring any complication in women and their newborns (UNICEF, 2021). According to Siseho et al. (2022), maternal and neonatal morbidity and mortality rates can be lowered by about 50% if delivery occurs with the assistance of a skilled birth attendant (SBA).

Worldwide, maternal and newborn health care has received strong support over the past two decades. The global community embraced the up scaling of maternal health by ensuring skilled births as one of the indicators in the Sustainable Development Goals (SDGs) (Bongaarts, 2016). The SDG 3 aims at lowering universal maternal mortality ratio to below 70 per 100,000 live births, neonatal mortality to 12 per 1000 live births and under-5 mortality ratio to 25 per 1000 live births by the year 2030. The

proportion of deliveries attended by a skilled health provider is indicator 3.1.2 of Goal 3 of SDG (UN, 2015).

The purpose of the SDG 3 is to enhance universal accessibility to sexual and reproductive healthcare services by all including skilled delivery by the year 2030 (Bongaarts, 2016). Studies have shown that assistance by a skilled birth attendant and availability of emergency obstetric care significantly minimizes maternal deaths (Ciapponi, 2017). Skilled birth attendance (SBA) is one of the indicators in the Sustainable Development Goals (SDG). Section 3.1.2: measures Proportion of deliveries conducted by skilled the health provender (doctor, nurse, or midwife). The SDG Goal 3: strives to ensure healthy lives and promote well-being for all at all ages while Target 3.1: aims at Reducing universal maternal mortality ratio to less than 70 per 100,000 live births by the year 2030 (Siseho et al., 2022).

Skilled birth attendance is one of the highly effective impact interventions to reduce maternal, newborn, and child mortality and morbidity (Adegoke et al., 2023). According to the World Health Organization (WHO) report in 2014, non-skilled attendants, including Traditional Birth Attendants (TBAs), cannot predict or appropriately manage or refer serious complications such as hemorrhage or sepsis, which contributes to high maternal mortality at both the intrapartum and postpartum periods.

Globally, despite significant progress over the last two decades, lack of skilled care during the antenatal period and delivery has been associated with approximately 303,000 maternal and 2.5 million neonatal mortalities in the year 2017. Three-quarters of all the maternal deaths took place during childbirth and the postpartum period (WHO, 2016). Globally, maternal mortality rate is 223 deaths /10000live births due to lack of skilled care (WHO, 2022). In Kenya, the maternal mortality rate is still high at 342 deaths per 100,000 live births (UNICEF, 2021).

In developed countries like Europe, Central Asia, Latin America, and the Caribbean, over 90% of births occur in health facilities under the watch of a skilled health provider, while in sub-Saharan Africa, only 57% of all births are delivered in a health facility (UNICEF, 2021). More than a third of women in most developing countries do

not have access to a skilled health professional during the antenatal period, and only 57% of births are attended by a skilled attendant (Maximore et al., 2022).

In Kenya, several policies supporting maternal health and providing strategic direction have been constituted, including the new Constitution of Kenya, Vision 2030, the poverty reduction strategy, the Kenya Health Policy (2012-2030), the National Health Sector Strategic Plan, the Kenya Health Sector Strategic and Investment Plan 2012-2018, the Kenya Reproductive Health Policy, Maternal, Newborn, Child, and Adolescent Health (RMNCAH) Investment Framework, and Universal Health Care (UHC) (Alam et al., 2019).

The government of Kenya has initiated various strategies such as Linda Mama, Free Maternal Health Care, and the Beyond Zero Campaign in the country with the aim of eliminating some of the financial barriers that hinder access to health facility care during pregnancy and childbirth. Despite these policies and strategies, deliveries by skilled birth attendants (SBAs) remain low in Kenya at 62%.

In Kenya, Promulgation of a new constitution in 2010, resulted to decentralized the governance structure and service provision, establishing 47 new counties as semi-autonomous governance units. With the devolution of healthcare services, it was expected that county governments would design innovative interventions in line with contextual realities and community health needs. The national government retained responsibility for health policy, providing technical assistance to the counties, and managing national referral health facilities (Masaba et al., 2020). The Kenya Health Policy 2012-2030 advocates for equitable provision of healthcare, with policy objective 4 focusing on providing health services in an equitable manner (Joseph et al., 2018). County health services are organized around three pillars: community, primary care, and referral services, aiming to ensure equitable allocation of government resources to reduce disparities in health status across the country (Kairu et al., 2021).

The "Beyond Zero" Campaign, launched in 2013 by Kenya’s First Lady under the slogan "No woman should die while giving life," aimed to strengthen emergency services for mothers and children by providing fully equipped mobile clinics to

counties with the highest burden of maternal mortality (Oyugi et al., 2023). Additionally, Universal health care ensures that all healthcare delivery services in public health facilities are offered free of charge, thus eliminating financial barriers that could hinder access to healthcare (Oyugi et al., 2023)

1.3 Statement of the Problem

Globally, despite significant progress over the last two decades, lack of skilled care during antenatal period and delivery has been associated with approximately 500,000 maternal and 2.5 million neonatal mortalities in the year 2016. Three-quarters of all the maternal deaths took place during childbirth and postpartum period. (WHO, 2016) Over 90% of these maternal deaths take place in developing countries (Oguntunde et al., 2018). Women in developing countries have an increased higher risk of dying prematurely from pregnancy related causes (41 compared to one in 3300) in developed countries this makes maternal mortality an indicator of social equity (Bongaarts, 2016).

Africa bears the highest burden of maternal deaths with about two thirds (542/100,000) of worldwide maternal deaths as compared to global average of 216/100,000 According to WHO, Kenya is among the top ten countries with the highest maternal mortality of 510/100,000 which is almost 2 thirds of global maternal average deaths (Bongaarts, 2016). A Kenyan woman's risk of dying from complications of pregnancy and childbirth over the course of her lifetime is about 1 in 45, compared to one in 3300 in the developed regions (Bongaarts, 2016).

The percentage of live births that are assisted by a skilled provider has increased markedly over the past two decades, from 41% in 2003 to 89% in 2022 (KDHS, 2022). In central and Nairobi areas, which are, the most socially and economically developed region of the republic of Kenya, Murang'a County has the lowest percentage of skilled deliveries at 96% as compared to other counties forming the larger central Kenya region Kiambu (99%), Nyandarua (98%), Kirinyaga (97%) and Nairobi (99%) counties (KDHS, 2022). In Kandara-sub–County Skilled deliveries stand at 65% while home deliveries are at 35% this is below the national and global targets of 100% (KDHS, 2022).

1.4 Justification of the Study

The effects of maternal death extend beyond the individual to impact the infant, other children, the family, and the community at large (Bongaarts, 2016). Research suggests that most maternal deaths are avoidable with appropriate strategies such as skilled birth attendance, emergency obstetric care, and community mobilization (Siseho et al., 2022). Increasing the proportion of deliveries attended by a skilled birth attendant (SBA) and enhancing the quality of healthcare during labor and delivery can significantly reduce maternal and neonatal mortality as well as stillbirths by more than half (WHO/UNICEF, 2020).

Consequently, increasing the number of deliveries conducted by skilled attendants represents a crucial intervention for preventing maternal mortality (Bongaarts, 2016). A study done by Ciapponi, (2017) on the impact of skilled birth attendance on stillbirths and perinatal mortality rate found that there is a significant reduction in stillbirth rate in deliveries conducted by skilled health personnel. Further, a study conducted by (Adashi et.al 2021) revealed that health facility delivery lowered neonatal mortality by 29% in developing countries.

Attendance by skilled health workers during deliveries reduces the risk of serious complications and averts most of the maternal deaths that would have otherwise occurred (Bongaarts, 2016). The risk of neonatal death due to intrapartum–related complication can be prevented by about 20 percent if the labor was assisted by a skilled birth attendant (WHO, 2016).

Appropriate medical attention and hygienic environment during labor and delivery reduces the risks of complications and infection that could cause maternal and neonatal morbidity and mortality (KDHS, 2014).Proper implementation of required skills and knowledge during intrapartum and immediate postpartum period reduces maternal and neonatal morbidity and mortality (Sakeah et al., 2021).The desires perceptions and demands of women and that of the care providers in the community can be addressed within the skilled delivery concept (Sialubanje et al., 2016)

Skilled Birth Attendance (SBA) has been one of the key high impact interventions/ approaches that Kenyan government pinpointed and adopted to have to reduce maternal deaths. However, even with presence of adequately laid out strategies to improve maternal health indicators through skilled delivery approach, there is no much achievement in regards to increase in skilled birth attendance in Kenya remains low at 89% (KDHS, 2022).

Kenya and the whole world at large will find it difficult to achieve the Sustainable Development Goals for child health without a strategic focus to improve quality care during labor and delivery of a child (Goyet et al, 2019).

Low number of Skilled deliveries (65%) and the lack of an existing model to enhance utilization of skilled delivery in the Sub-County, are the factors that triggered the researcher to carry out this study that culminated in the development of a model of care that is composed of multiple strategies to promote the level of utilization of skilled deliveries in the study area.

In summary, developing a model of care is essential for optimizing healthcare delivery, improving patient outcomes, and ensuring that healthcare practices are aligned with the latest evidence and standards. It creates a roadmap for healthcare providers to deliver consistent, high-quality care in an efficient and patient-centered manner. The strategies in the developed model strategies will bridge the gap of the low number of skilled deliveries in the Sub-County hence improve the maternal and child health as envisioned in the global vision 2030 and the sustainable development goal number 3 .1 and also with the African Union (AU) 2009 summit in Ethiopia , agenda 2063 on the Campaign for the Accelerated Reduction of Maternal Mortality in Africa (CARMMA).with a slogan: 'Africa Cares: No Woman Should Die while Giving Life'. AUC (2009)

1.5 Significance of the Study

The aim of this study was to develop a care model aimed at enhancing the utilization of skilled birth attendance services, thereby improving maternal and child health in Kandara Sub-County and throughout Murang'a County to 100% as per SDG 3.1. The

research outcomes could inform policy-making by the government regarding maternal and child health in both the county and the nation as a whole. Ultimately, this would contribute to reducing maternal and neonatal morbidity and mortality, addressing significant challenges within the study area and the nation overall. Moreover, the study results will add to the existing body of nursing and midwifery knowledge, serving as a reference for other scholars. Additionally, these findings will enrich the pool of nursing and midwifery research, advancing the nursing profession.

1.6 Research Questions:

1. What are the client's experiences on skilled delivery services among women of reproductive age in Kandara Sub- County?
2. What are the strategies that can increase the uptake of skilled delivery services among women of reproductive age in Kandara Sub-County?
3. What model of care could be developed to increase the uptake of skilled delivery services among women of reproductive age in Kandara Sub-County?
4. What is the level of utilization of skilled delivery services among women of reproductive age after testing of the model of care in Kandara Sub-County – Murang'a

1.7 Research Hypotheses

1.7.1 Null Hypotheses

There is no statistically significant difference in the level of utilization of skilled delivery services between the intervention and comparison groups after testing of the developed model of care.

1.7.2 Alternative Hypothesis

There is a statistically significant difference in the level of utilization of skilled delivery services between the intervention and comparison groups after testing of the developed model of care.

1.8 Research Objectives

1.8.1 Broad Objective.

To develop a model of care to promote utilization of skilled delivery services among women of reproductive age in Kandara Sub-County

1.8.2 Specific Objectives

1. To establish client's experiences on skilled delivery services among women of reproductive age in Kandara Sub- County.
2. To establish strategies to increase the utilization of skilled deliveries among women of reproductive age in Kandara Sub-County.
3. To develop a model of care to increase the utilization of skilled delivery services among women of reproductive age in Kandara sub -county.
4. To evaluate the level of utilization of skilled deliveries among women of reproductive age in Kandara Sub-County after testing of the developed model of care

1.9 Variables

1.9.1 Independent Variable

Experiences of skilled birth attendance

- Quality of care
- Interpersonal relationship with the care givers
- Waiting time before care is given
- Environment of care- (privacy, confidentiality)

1.9.2 Intervening Variables

Strategies of the developed Model of care

1.9.3 Dependent Variables

- utilization of skilled deliveries

1.10 Theoretical Framework

The suitability of a theory is governed by three criteria namely; logic or internal consistency of a theory - not to yield mutually opposing derivations, the degree to which the theory is generally relevant while using a wide number of concepts and the likelihood of the theory to fit in within other existing theories in the discipline (Parady et al., 2021). Therefore, as per the aforementioned criteria, this research was based on two theories namely: Theory of change and Health Belief Model.

1.10.1 Health Belief Model

The health belief model framework is used for assessment of individual health behavior and why individuals accept or fail to accept to engage in health-related activities. It is broadly utilized in health behavior studies to modify and preserve health related actions, as well as a supervisory framework for health action strategies (Luger, 2020),

The Model encompasses various paradigms/ variables that envisage reasons why some individuals will engage themselves with activities to prevent, to investigate for, and to control ailments. These paradigms / variables include:

- Susceptibility (probability of an individual to contract a disease)
- Seriousness (individual's convictions in the intensity of ailment and its adverse effects)
- Benefits (individual convictions and understanding that the effects could be positively be influenced by specific health action;
- Barriers to behaviors (person's perception of the strains hindering them from adhering to a particular health-related action);
- Cues to action (determinants that that elicit health actions)

- Self-efficacy (individual's conviction in own ability to perform an activity effectively). Figure 1.1 shows a diagrammatic show of Health belief model

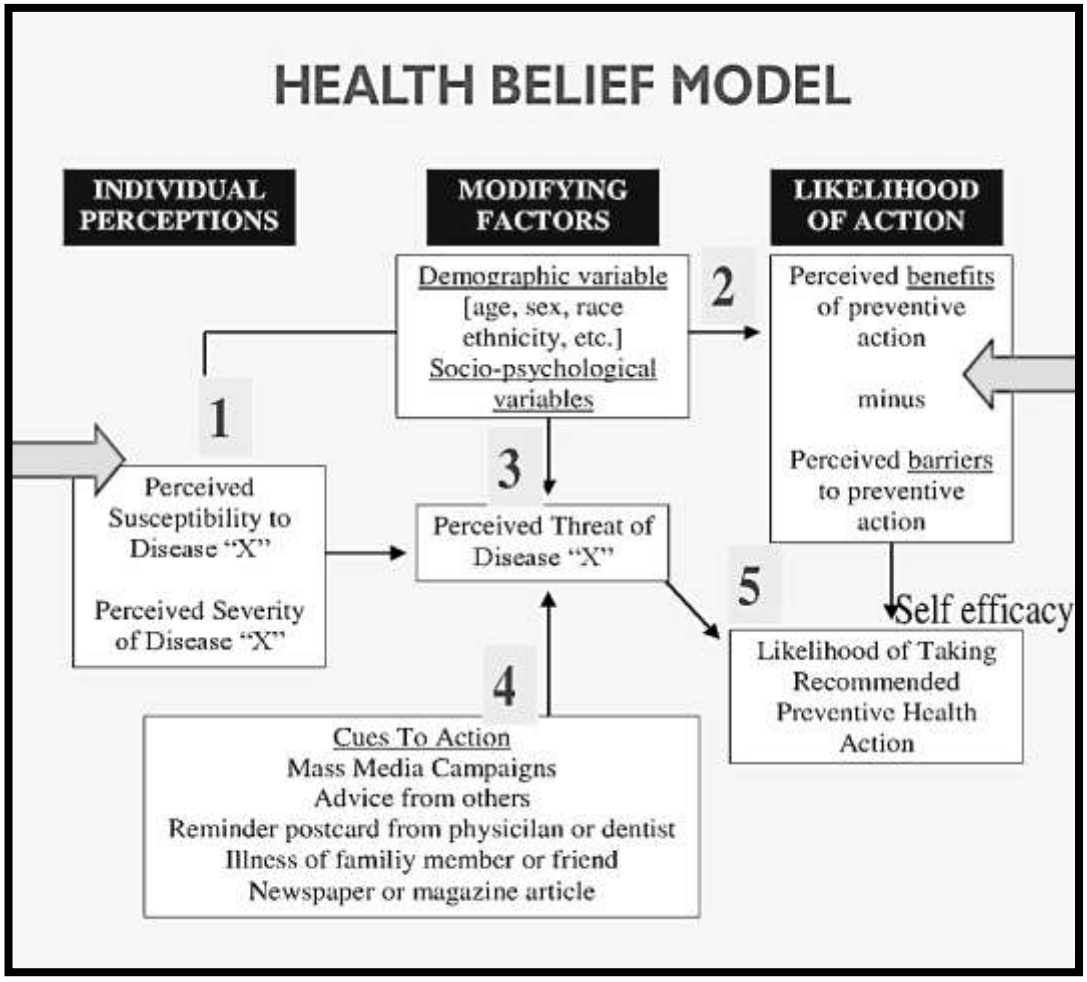

Figure 1.1: Health Belief Model, Adopted from Green, & Gryboski, K. (2020).

1.10.1.1 The Scope of Application of HBM

Preventive health activities like health promotion are critical in contributing to health communities. Sick role behavior that is compliance with advocated medical treatments, following professional diagnosis of a disease and clinical use, comprising of doctors' visits for a various reason, Fig 1.2 below indicates the scope of health belief model.

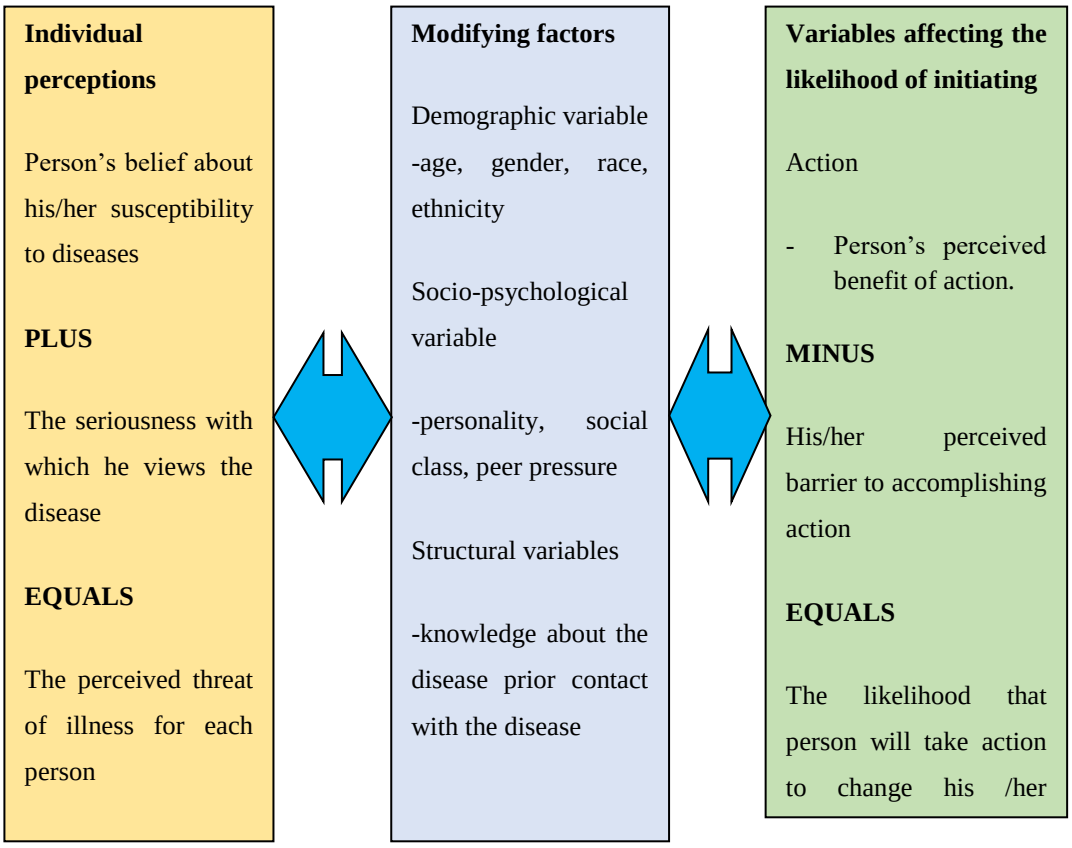

Figure 1.2: Scope of Application of Health Belief Model

1.10.1.2 Justification for Selecting the HBM Theoretical Framework

The HBM best suits this study because it deals with health seeking behavior component of this study. It concentrates on why individuals take actions to prevent or control illnesses while others do not. The barriers or enabling factors for the utilization of skilled birth attendance services are best clarified within the construct of this model. This model is well suited to answer the research questions in this study.

1.10.1.3 Application of HBM

In this study, the model would help in explaining the reasons why some pregnant women will take action to prevent health complications by utilizing skilled birth attendance services, while others do not. The HBM is organized into three major components that explain human behavior towards health services utilization, and in

this case behavior of women of reproductive age towards the utilization of skilled birth attendance services, specifically:

- Individual perceptions of pregnant mothers regarding the utilization of skilled birth attendance services
- Modifying factors that influence women perceptions and behaviors on the uptake of skilled delivery attendance services, such as: Demographic-determinants like age, ethnicity; Socio-demographic variables personality, social, economic; structural variables related to women's knowledge about the benefits of utilizing and dangers of lack of utilizing skilled delivery attendance services
- Variables affecting the probability of pregnant women's activities to utilize skilled delivery attendance services. The basis of the HBM is that individual pregnant women's health beliefs are affected by their opinion towards the skilled delivery services...

Perceived barriers like the health workers' undesirable attitudes and the poor accessibility, perceived poor quality of skilled health care, acceptability and availability of the skilled delivery services could influence the decision of not to utilize the skilled delivery services (Agarwal et al., 2022).

The principle of the HBM is that individual pregnant mother has perceived risks to pregnancy-linked complications could influence the use of skilled delivery services. Adverse effect experienced in current or past pregnancies could influence the uptake of skilled delivery care. Health education, counseling, birth preparedness and complication awareness and readiness with effective social support systems are likely to induct cues for action.

1.10.1.4 Application of the HBM in the Study

The researcher utilized the principles of HBM in phase one to identify the Individual perceptions of pregnant mothers regarding the utilization of skilled birth attendance services, modifying factors that influence women perceptions and behaviors on the uptake of skilled delivery attendance services and the Variables affecting the

probability of pregnant women's activities to utilize skilled delivery attendance services. The HBM helped the researcher to come up with a conceptual framework composed of variables and strategies that aided in development of a model of care.

1.10.2 Theory of Change

A theory of change is a purposeful model of how an initiative such as a policy, a strategy, a program, or a project contributes through a chain of early and intermediate outcomes to the intended result. Theories of change help navigate the complexity of social change (Gugerty &Karlan, 2018; Serrat & Olivier, 2017).

This theory explains how activities are fathomed to produce results that contribute to attaining the ultimate intended goals. It can be developed for any level of intervention including an event, a project, a programme, a policy, a strategy or an organization.

Before beginning to monitor programs or evaluate their impact, organizations need to ensure that they have a sound theory of change to guide their work. A theory of change is a conceptual map of a program or a model of how an initiative such as a policy, a strategy, a program, or a project—contributes through a chain of early and intermediate outcomes to the intended result and can help navigate the complexity of social change (Serrat $ Olivier.2017).

This theory is a broad description and a design of how and why an anticipated change is expected to transpire in a particular setting. It is focuses on mapping out or "filling in" what has been described as the "missing middle" between what a program or change initiative performs (its activities or interventions) and how these lead to anticipated targets was achieved (Serrat $ Olivier. (2017).

It recognizes the desired long-term aspirations and then works back to identify all the circumstances (outcomes) that must be ready in place for the achievement of the set goals. Theory of Change arose from the theme of program theory and program evaluation an innovative system of analyzing the theories inspiring programs and initiatives effective for social and political transformation justifying the strategies it utilizes to achieve its goals (Hollingsworth & Gant, 2017).

The definitive success of Theory of Change rest in its power to prove progress towards achievement of set goals. Confirmation of achievement ratifies the theory and that the idea is effective. Thus, the outcomes in a Theory of Change should be linked with indicators that direct and enable measurement. Indicators operationalize the after effects, thus making the outcomes reasonable in concrete, detectable and quantifiable terms (Gugerty & Karlan, 2018)

Theory of change displayed in a results chain are presented for each phase and the pertinent boxes interconnected to illustrate how specific activities result to specific outputs, and how these specific outputs result to specific outcomes. For example, the input of a training strategy of antenatal mothers will result to increased knowledge on safe motherhood, which will in turn culminate to changed behaviors that will enhance increased utilization of skilled births. An intervention theory of change present numerous causal channels to character change that may influence social norms, infrastructure expansion and personal motivation drive (UNICEF, 2021). A results chain (pipeline model) representing the theory of change in series of boxes is as shown in the figure 1.3.

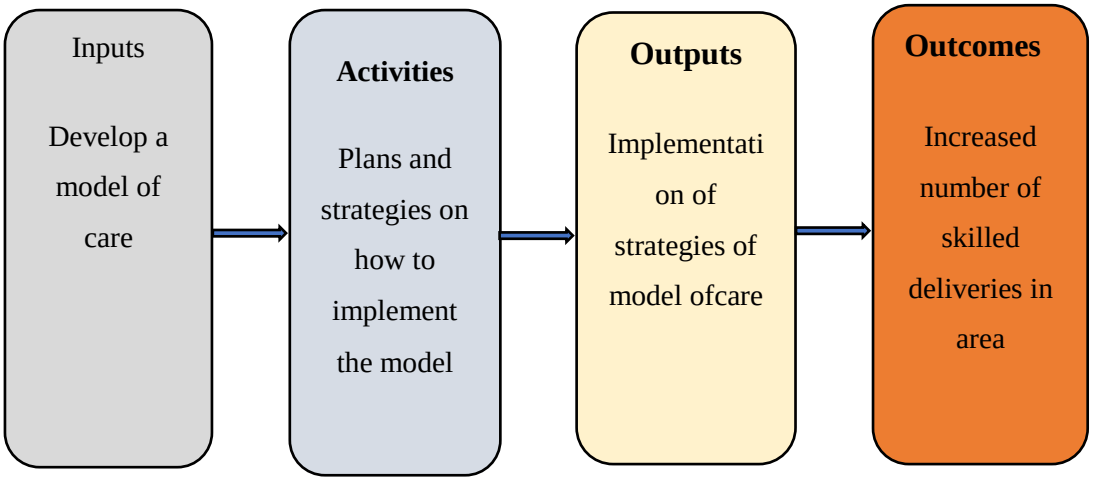

Figure 1.3: Theory of Change (Pipeline Model) Theory of Change (Pipeline Model)

Adopted from (Gugerty & Karlan 2018)

1.10.2.1 Rationale for Use of Theory of Change in this Study

Theory of change is used in experimental and quasi-experimental designs, to identify necessary variables that can be adopted when evaluating treatment and control groups. Theory of change is used for a variety of data both qualitative and quantitative thus providing provisions for triangulating the data that result from evaluation of mixed methods (UNICEF, 2021). Therefore, this theory was utilized in phases one and two of this study (model development and testing respectively) as it is well suited for research designs used in the phase (quasi experimental) as well as for qualitative and quantitative data that was generated in this study.

1.10.2.2 Application of Theory of Change in this Study

The theory of change was utilized in phase one during model development and also in phase 2 for the purpose of implementing and evaluation of the outcomes of model implementation.

1.10.3 Justification of Utilization of both Health Belief Model and Theory of Change

The two theories are applicable in this study in that they are interdependent as the HBM aided the researcher to uncover the problems and come up with the strategies that could be used to tackle the problems during the phase one of this study (baseline study). On the Other hand, the strategies were used as components to development of the model of care. The theory of change was applicable in model development and also in phase 2 where its principles and components were utilized to test the developed model of care.

1.11 Conceptual Framework

A conceptual framework is a set of ideas and general conceptions, which have been integrated into a meaningful configuration. The framework represents general ideas that focus of a specific scientific discipline.

The concepts focus on recognized circumstances and shape an individual understanding of the specific discipline (Qin et al, 2014). In this study, the framework illustrated in Figure 1.4 below was utilized.

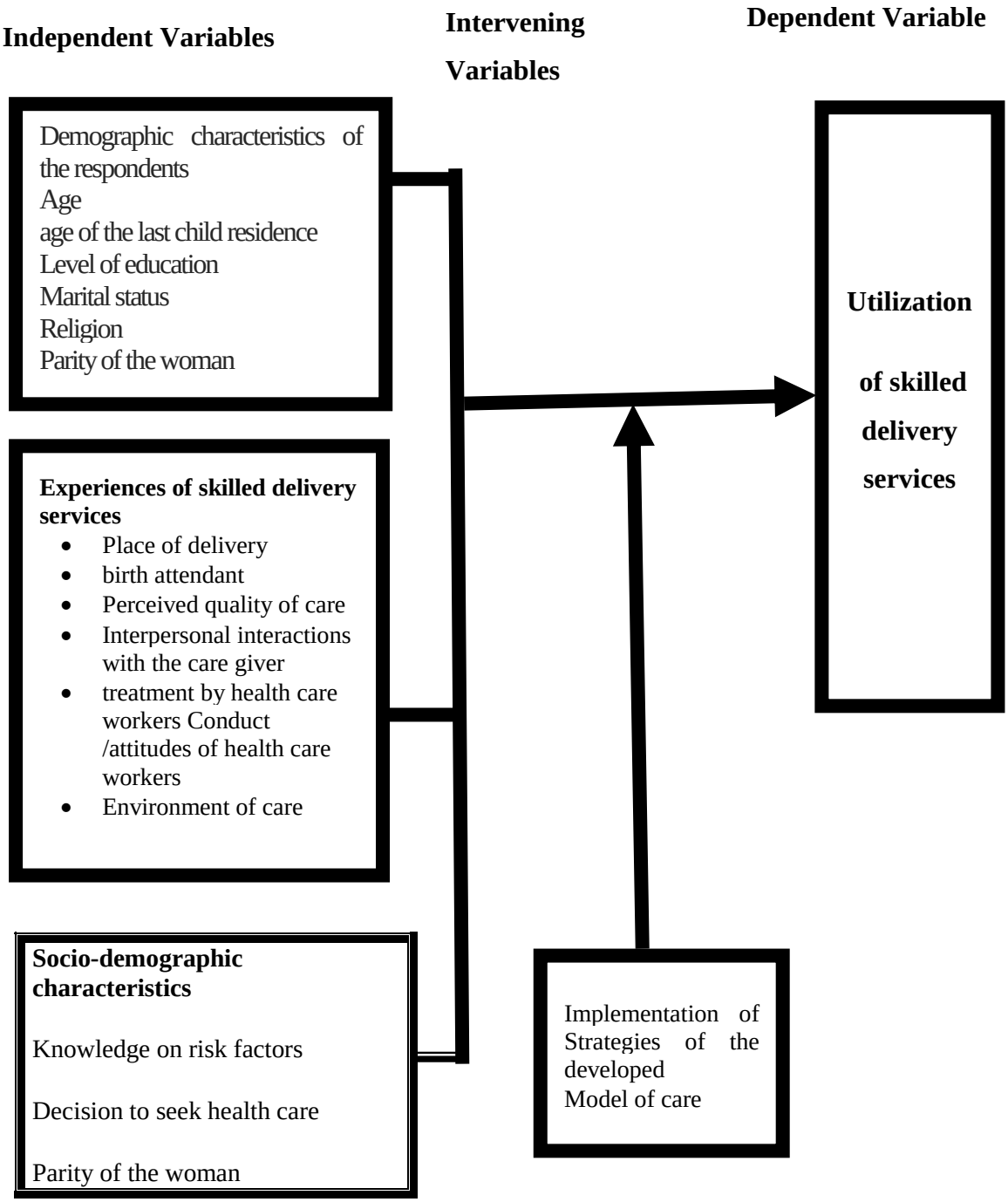

Figure 1.4: Conceptual Framework

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter depicts a review of literature on skilled delivery care, internationally, regionally and nationally. Determinants of the utilization of skilled birth attendance, reasons for low uptake of skilled delivery care and strategies to enhance the use of skilled birth attendance were discussed in this chapter. There are combinations of factors that will influence a woman to seek skilled delivery services as indicated by a study done in Ethiopia by Kitila et al, (2022)

The literature review in this study used Mendeley, google scholar and Zotero data bases to search for relevant literature. The study targeted current data of not more than 10years old since publication. The literature followed the concepts of health belief model namely: modifying factors, individual perceptions and likelihood of action and applied the paradigms/variables to unearth the problems and possible solutions/strategies to solve them as indicated in Table 2.1 below.

Table 2.1: Variables of Health Belief Model

Variables	Definition
Perceived susceptibility	probability of an individual to contract a disease
Perceived severity	individual's convictions in the intensity of ailment and its adverse effects
Perceived benefits	individual convictions and understanding that the effects could be positively be influenced by specific health action;
Perceived barriers	person's perception of the strains hindering them from adhering a particular health-related action e.g. cost and difficulties
Cue to action	determinants that that elicit health actions (both internal and external triggers that will prompt an individual to seek health care services)
Self-efficacy	individual's conviction in own ability to perform an activity effectively (belief in one's own ability to do something)

2.2 Client's Experiences of Skilled Deliveries

This is one of the modifiable factors of HBM where studies reveal that:

Women who have ever delivered in a health facility are more likely to continue to deliver in health facilities during the subsequent deliveries regardless of other confounding variables. This is particularly more evident when mothers had developed complicated delivery previously, are aware of the services rendered to them, or perceive the services rendered as satisfactory (Kifle et al., 2018)

Globally, a study done in Goa India showed that women are likely to deliver in the same previous place of delivery if they were satisfied with the care given (Vernekar, 2021). Another study done in Sub-Saharan countries showed that the utilization of skilled birth attendance services during previous deliveries can motivate women to utilize skilled birth attendance services in future pregnancies (Gwacham-Anisiobi & Banke-Thomas, 2022)

A study in developing countries proved that the perceptions of the delivery process as a natural experience, unfamiliar delivery procedures in health facilities, phobia of episiotomies, lack of privacy, and lack of support during the process of child bearing emerged as some of the hindrances for women opting for a health facility childbirth (Bohren et al., 2014). Other determinants include perceived stigma and discrimination in relation to phobia of mandatory HIV testing in health facilities (Bohren et al.2014).

A study conducted in rural Bangladesh revealed that women, having had a severe life-threatening complication, like prolonged labor, excessive bleeding, or breach presentation expressed their preference for health facility childbirth (Mathewos & Kassa, 2021).

In Africa, a study done in Gambia revealed that women perceived that the health care workers have the skills to handle complications, and is in custody of relevant equipment to handle any complication that may occur during the delivery process and therefore preferred to deliver under skilled health personnel (Mathewos & Kassa, 2021).

A study done in Northern Ethiopia revealed that TBAs could do little at home when complications occurred and that women felt that health facilities were better primed to handle obstetric complications once they occur (Gurara et al., 2020) A study by Adewemimo et al., (2014) found that the history of having delivered in health facilities as a predictor of the utilization of SBA during childbirth. A study in North West Ethiopia found out that previous delivery at a health facility was independently and significantly attributed to 45% decreased probability of subsequent visit for health facility delivery (Gudeta & Dirirsa, 2021).

Another study done in Ethiopia showed that negative childbirth experiences with facility delivery could deter women utilizing skilled birth attendance services in future pregnancies (Amentie, 2022). A study done in Ethiopia revealed that substandard care, previous bad experiences with health workers and lack of knowledge on the advantages of skilled birth attendance services led to the lack of utilization of skilled delivery services (Shiferaw & Modiba, 2020).

In Kenya, a study by Afulani &Moyer, (2016) revealed that the present health status of a woman, past poor health status or pregnancy complications, health knowledge, socio-economic, and sociocultural determinants influenced the perceived need for skilled birth attendance services. Another study done in Kenya by Daniel (2015) revealed that Past experiences in hospital delivery may influence the client to plan and utilize the services in future pregnancies.

2.2.1 Perception of Quality of Care Received

Quality of care is basically the satisfaction of a client with the services he/she receives (Kaur, 2020).

Individual perception from personal or experiences of others or simply from public opinion on the quality of services are much more influenced by time given to the patient, waiting time, and the health care interpersonal communication skills, facility set up sophisticated medical equipment, and adequate staffing (Larson et al., 2014). A proof on an individual perception and satisfaction with the quality of maternal care helps to determine other aspects of care that need strengthening in to support

sustainable long-term demand, generate significant changes in maternal care-seeking behavior, and identify barriers in developing countries (Vyas et al., 2022).

Clients who perceive the quality of care in a health facility was satisfactory, have a high probability of visiting it again hence increasing the need for the service this leads to improved utilization of services (Vyas et al., 2022). A study done by Heaman et al., (2015) states that staffs who were lovely, efficient and saluted clients by their name, had a positive effect on how women perceived their care thus the clients felt more satisfied with the quality care accorded to them. According to (Vyas et al., 2022), an improvement in public health services in matters of maternal and child health led to enhanced utilization, client satisfaction, and improved health outcomes. A study done in Ghana by Adatara et al., (2019) revealed that quality services in health facilities enhanced women to seek the services

Offering of quality and respectful care has an influence on the uptake of skilled birth attendance as revealed by a study done in Tanzania by Hulsbergenet al, (2020). Another study done in USA Georgia proved that client satisfaction with health services is a predictor of future use of the same services (Sehngelia et al., 2021).

2.2.2 Interpersonal Interactions with the Care Givers

Globally, a study done by WHO determined that the caregiver's attitudes is important to the pregnant woman while making a decision to choose skilled delivery services (Uzun Aksoy & Gürsoy, 2018). Two studies by Anastasi et al., (2015) and Bohren et al., (2014) in seventeen developing countries in South America, Asia Middle East and Africa discovered that client's distress or past incidences of poor interpersonal care from health workers was a major hurdle for mothers to deliver in health facilities.

A study in Nepal in southern Asia revealed that Positive attitude of health care worker towards women during delivery process including reassuring, encouraging and being polite, proved to encourage the utilization of SBA services by women (Aryal et al., 2022), A Canadian study by revealed Heaman et al., (2015) found out that poor interpersonal relationship affected the client's compliance with advice and discouraged them from pursuing skilled health care during forthcoming deliveries

Another study done in Indonesia by Pervinet al, (2021). indicates that where health services are available, they often fall short of being patient-friendly.

In Africa. a study by Sialubanje et al., (2016) in Zambia revealed that clients preferred unskilled birth attendants claiming that they are friendlier. Another study done in Nigeria revealed that women prefer TBAS as they are always available over trained attendants whom they claimed that they were not concerned about the clients and are bossy and leave immediately the delivery occurs (Chukwuma et al., 2017). Another study done in Malawi indicated that clients claimed that the TBAs did not desert them and their neonates postnatally unlike the health workers (Ryan et al., 2014). Another study in Malawi found that women were against government policy to withdraw TBAs claiming they play a major role in ensuring women deliver in a conducive environment (Uny et al., 2019).

Research by Dako-Gyeke et al., (2013), in Ghana revealed that respondents reported poor patient-provider interactions where health providers were described as abusive, rude, domineering, unhelpful, disrespectful, judicious, high tempered, with a negative attitude, inconsiderate and did not communicate on labor progress to their clients and significant others. A study done in Ghana by Yakubu et al., (2014) revealed maltreatment by health facility midwives was one of the impediments to the utilization of SBAs. Mothers who experienced positive attitudes and good conduct were more likely to return to a facility for future delivery (Mannava et al., 2015).

A study conducted in rural Ethiopia revealed that most women opted to give birth at home despite receiving antenatal care in a health center citing the negative health care worker attitude (Sendo et al., 2020), A study in Eritrea by Kifle et al., (2018) revealed that women who perceived hospital delivery practices unsatisfactory were not satisfied with the health professional's communication approaches and the level of environmental cleanliness

A study carried out by Sialubanje et al., (2016) in Zambia on client's attitude towards the health care worker and their past experiences were significant factors that influenced woman's decision to give birth at home other than in the facility. A study done in Zambia indicated that health workers did not have a kind language while

attending to women when they visited the facilities for delivery. Clients also claimed that home birth attendants were friendlier, present and did not forsake them and their newborns after delivery (Sialubanje et al., 2016)

In east Africa , Studies done in Tanzania, revealed that women experienced negative attitude of health care providers and also felt of neglected due to lack of attention and support this led to blaming them for the unwanted birth outcome (Moshi & Mbotwa, 2020) The behaviors and attitudes of the healthcare workers influences the women's decisions on utilization of existing health facilities (Akum, 2013).Another study revealed that maltreatment of women during labor by the health care workers was one of the factors that deterred the women to seek skilled delivery services (Mayra et al., 2022).

2.2.3 Environment of Care / Set Up

The environment during delivery can influence physiologic birth. Health care workers can support physiologic birth by ensuring a calm environment that lessens the stress hormones during the labor process (Stark et al., 2016). A study conducted in rural Ethiopia revealed that the absence of health care workers during odd hours dissuaded mothers from delivering in health facilities (Shiferaw & Modiba, 2020). According to an Online Nursing Continuing Education program in California, USA, most health workers are insensitive to socio-cultural issues of the community, leading women to feel that it is not acceptable to seek care where cultural values are not honored (Vista, 2017).

Pervin et al. (2021) found that health services, where available, often fall short of being patient-friendly. Similarly, Anastasi et al. (2015) discovered that allowing women to practice traditional customs in health facilities can make them more women-friendly and respectful of individual beliefs and customs. In Tanzania, Mahiti et al. (2015) revealed that mothers with a good understanding of health facilities perceive healthcare workers as properly skilled to manage obstetric complications and provide necessary diagnostic procedures.

In Nigeria, Ajaegbu (2013) identified concerns such as the absence of female healthcare providers and the unavailability of drugs as factors influencing the utilization of maternal health services. Privacy emerged as a key factor affecting mothers' utilization of skilled health care services during delivery (Srivastava et al., 2015). Additionally, cleanliness and hygiene maintenance post-delivery influence women's satisfaction with the service (Srivastava et al., 2015).

A study in Ethiopia highlighted various obstacles to skilled delivery, including the absence of privacy, lack of information, poor staff skills, and shortages of workers and supplies at health facilities (Kitila et al., 2022). The availability of healthcare workers throughout the labor process encouraged women to utilize skilled birth attendant services in the future (Akum, 2013). Conversely, a study in Eritrea found that mothers were dissatisfied with the cleanliness of the delivery area in general hospitals (Kifle et al., 2018). In Kenya, Orwa et al. (2022) demonstrated that facility preparedness to offer maternal/neonatal services is a crucial factor encouraging women to seek skilled delivery services.

2.2.4 Delays

Delay in accessing healthcare can significantly influence the decision to utilize skilled delivery services (Tesfaye et al., 2020). Promptness of care is a critical principle in perceived good delivery care, with women demonstrating satisfaction with promptly provided health services (Bhattacharyya et al., 2013).

Studies in Gambia and Ghana highlighted delays in service provision, with long waiting times and slow attendance from healthcare providers contributing to perceived poor quality of care (Ferguson et al., 2020; Dako-Gyeke et al., 2014). Delay in reaching healthcare facilities, among other factors, was cited as a primary reason for mothers not seeking skilled delivery services in southern Ethiopia (Gudeta & Regassa, 2021).

Residence location also plays a crucial role, with proximity to health facilities impacting childbirth. Women from rural areas, in particular, demonstrated minimal attendance to antenatal care (ANC) (Gudeta & Regassa, 2021). Expectant mothers in rural hospitals with limited resources often require referrals to higher-level facilities

for laboratory and radiological tests during ANC visits, contributing to challenges in planning for delivery due to transportation difficulties and uncertainty about service availability (Hailemariam et al., 2021). Similarly, in remote areas of Ethiopia, transportation costs and distance hinder women from seeking maternal health services, contributing to delays in reaching healthcare facilities (Aluko et al., 2020).

2.2.5 Parity of the Woman

Parity is defined as the number of times that a woman has given birth to a fetus with a gestational age of 24 weeks or more, irrespective of the fetal viability. Woman's past delivery experiences and delivery outcomes could inform her future place of delivery (Bohren et al., 2014). Women who experienced pregnancy linked complication had a probability of 1.9 times more likely to delivery at health facility (Bongaarts, 2016). A study done in Eritrea indicated that first time mothers had more facility delivery than the older mothers This could be due to the already developed notion that delivery is a natural process and does not require any assistance (Kifle et al., 2018).

A study conducted in sub-Saharan African countries identified several key factors that supported skilled delivery. These factors included experiencing complications during previous deliveries, choosing the supine position during delivery, health workers' preference for placenta disposal, and women's autonomy in deciding whether to attend antenatal care (Gwacham & Thomas, 2022).

A study in Nepal revealed that institutional delivery was significantly more observed in prime-parous mothers the reason being that the lower parity mother might have less experience at childbirth that she may develop fear about the difficulties during labor. On the other hand, Multiparous mothers who had their past deliveries at home have high probability to deliver without skilled attendance in their recent pregnancy (Shrestha & Shrestha, 2019).

A study conducted in Nigeria revealed that women who had experienced a previous delivery without complications were less likely to seek skilled health attendance during subsequent deliveries compared to first-time mothers. This pattern may stem

from the uncertainty experienced by first-time mothers regarding the delivery process and its outcome (Uka, 2022).

In Ghana, research by Sakeah et al. (2021) indicated that women with higher parity are less likely to opt for skilled attendance during delivery. Similarly, a study conducted in Kenya found that women who had experienced previous normal deliveries were less inclined to utilize skilled attendance during subsequent deliveries compared to nulliparous women (Gitimu et al., 2015).

In Zambia, a study revealed that identification of high-risk pregnancies during antenatal care (ANC) and previous obstetrical complications increased the likelihood of seeking skilled attendance during delivery (Sialubanje et al., 2016).

Contrastingly, another study presented contradictory findings suggesting that stigma associated with pregnancy could deter women from seeking skilled birth attendance (SBA) services. This stigma particularly affected women with multiple children, young women, and unmarried women, who feared judgment and ostracism from their communities (Sumankuuro et al., 2017).

2.2.6 Knowledge of Danger Signs in Pregnancy

Understanding the danger signs in pregnancy is crucial for pregnant women's preparedness for childbirth. A higher level of knowledge about these signs serves as a determinant in the utilization of skilled delivery services. It facilitates the early recognition of potential problems during pregnancy, leading to reduced delays in seeking care and ultimately improving skilled attendance during childbirth (Masudio et al., 2019). Conversely, a deficiency in knowledge regarding the importance of seeking medical attention during pregnancy and childbirth negatively impacts pregnant women's health behaviors and decision-making processes. This deficit in knowledge can hinder timely access to skilled delivery services, thereby posing risks to maternal and neonatal health outcomes (Yar'zever et al., 2013).Research conducted in Bangladesh highlights the crucial role of maternal knowledge in determining the perceived need for skilled birth attendance services, ultimately influencing women's decisions regarding health facility delivery (Pervin et al., 2021). Conversely, women

lacking adequate knowledge about maternal health services and the risks associated with home delivery often opt for home births (Gamage et al., 2022). Similarly, a study in Nepal demonstrated that exposure to mass media information enhances awareness of social changes, including health-related issues, shaping individuals' attitudes and behaviors (Shifraw et al., 2016).

Further studies corroborate the significance of health education provided during antenatal care (ANC) visits in preparing women for skilled delivery. Munguiko et al. (2019) established that women who received health education during ANC visits were better prepared for delivery, resulting in increased utilization of skilled birth attendance services. Similarly, in Kenya, women who received talks on blood pressure during prenatal care were twice as likely to utilize skilled delivery services compared to those who did not (Onono et al., 2020).

In Ethiopia, a case-control study found that inadequate knowledge of pregnancy-related services was associated with a higher likelihood of home delivery (Gebre et al., 2018). Conversely, in Bangladesh, clients with knowledge of danger signs during the antenatal period were more prepared for skilled birth (Pervin et al., 2018). Similarly, in Pakistan, women empowered with knowledge about labor and delivery complications were four times more likely to choose health facility delivery (Malik et al., 2023). In Nepal, providing women with knowledge about maternal and child health significantly increased the utilization of skilled maternal, newborn, and child health services (Khatiwada et al., 2020).

In northern Nigeria, providing health information during antenatal clinics influenced women's decisions regarding home delivery versus skilled delivery (Ango et al., 2018). Likewise, in Kenya, women with a better understanding of health matters were more likely to opt for skilled deliveries (Afulani et al., 2017). In Ethiopia, mothers who could identify key danger signs of labor were more likely to utilize skilled delivery services, while inadequate information about pregnancy and labor complications was associated with a higher likelihood of home delivery (Letose & Tura, 2020; Amentie,2022)

2.2.7 Antenatal Attendance by the Pregnant Women

The quality labor outcome is enhanced through appropriate antenatal-care (ANC) paired with better choice of place of delivery (Kuhnt & Vollmer, 2017). Antenatal care aims at optimizing the health of both the fetus and the mother by screening for any deviation from good health, to intervene where applicable, to enhance the women's experience during pregnancy and delivery as well as to prepare new mothers for parenthood. The ANC components include diagnosis of possible risks, prevention and management of pregnancy-allied Complications; and health promotion and health education (Bongaarts, 2016).

Antenatal care is defined as the care given by skilled health-care worker to pregnant women during pregnancy by early detecting and managing pregnancy-related ailments, and referral of special cases to an appropriate specialized care (Konje et al., 2018). Initiating ANC early especially in the first trimester is paramount as this allows healthcare workers detect and manage any complications to a pregnant woman and this promotes maternal health and prevention of any illnesses and obstetric disorders that can arise (Gacheru, 2019).

The ANC model of 2016 emphasizes a structured schedule of antenatal care visits, recommending a minimum of eight visits throughout pregnancy. These visits are distributed across the trimesters, with the first visit scheduled during the first trimester (up to 12 weeks of gestation), two visits during the second trimester (at 20 and 26 weeks of gestation), and five visits during the third trimester (at 30, 34, 36, 38, and 40 weeks) (WHO, 2016).

Research conducted by Onono et al. (2020) revealed a significant relationship between the number of ANC visits and birth preparedness (BP). Mothers who attended more than four ANC visits were found to be 3.16 times more prepared than those with fewer visits. Similarly, findings from a study by Pervin et al. (2018) indicated that ANC attendance correlated with the level of preparedness for delivery and childbirth. Women who attended more than four ANC visits were six times more prepared compared to those with fewer visits or none at all. These results were consistent with the findings of Bogale et al. (2019), who demonstrated that ANC attendance improved

birth preparedness by more than four times for women who attended ANC compared to those who did not, highlighting the significance of ANC visits in preparing women for childbirth.

If mothers perceive ANC services negatively, regardless of the number of visits advocated in the WHO ANC model, they may choose not to attend ANC clinics (WHO, 2016). Therefore, the primary objective of the model is to provide pregnant mothers with personalized, relevant care during each visit by implementing effective clinical practices, providing timely and pertinent knowledge, emotional support, and interventions by healthcare workers. Qualitative evidence suggests that mothers typically view ANC as a valuable source of information and appreciate any guidance that may lead to positive pregnancy and birth outcomes, thereby enhancing the uptake of skilled deliveries (Downe et al., 2016).

In developing countries, most maternal deaths are attributed to poor maternal healthcare-seeking behavior, evidenced by low uptake of antenatal care and skilled deliveries (Sibiya et al., 2018). Increased ANC contacts have been associated with skilled deliveries, with mothers who had more than four ANC visits having a 2.7 times higher probability of delivering with skilled attendance compared to those with fewer contacts. This may be due to intensified contact time with care providers, which provides opportunities to emphasize the importance of delivering in a health facility, leading to better understanding among women (WHO, 2016). Factors influencing maternal healthcare-seeking behavior are multifactorial, as evidenced by a study in Western Kenya (Ayodo et al., 2021).

In Nigeria, knowledge of ANC significantly influences mothers' choice of delivery location, likely due to information received during antenatal visits about pregnancy-related complications and the benefits of giving birth at health facilities (Ango et al., 2018). Similarly, in Bangladesh, an increased frequency of ANC visits significantly influences the uptake of skilled delivery (Pervin et al., 2018). Studies by Letose & Tura (2020) found that mothers who were well-prepared for birth and its complications during antenatal care had a higher probability of utilizing health facilities during delivery.

In Kenya, a high number of ANC contacts positively predicts the use of skilled birth attendance at the time of childbirth (Kawakatsu et al., 2014). Conversely, a study in Ethiopia revealed that the likelihood of home delivery was higher among clients whose first ANC visit occurred after 24 weeks of pregnancy (Amentie, 2022). Lack of ANC attendance impedes health facility delivery, as demonstrated by research conducted by Bohren et al. (2014). Additionally, women who did not attend ANC clinics during pregnancy were twice as likely to have a home delivery compared to those who did attend ANC (Bayu, 2015). ANC check-ups during pregnancy have been shown to be a significant factor in the utilization of skilled births (Alemayehu & Mekonnen, 2015).

In Nigeria, women who prepared individual birth plans were more likely to be prepared for skilled delivery at the time of birth (Olowokere et al., 2020). However, in Ethiopia, some women who attend focused antenatal care fail to deliver in health facilities due to perceived benefits of home delivery, knowledge deficits about health facility-based delivery, poor access to healthcare facilities, and inadequate health resources (Sendo et al., 2020)

2.2.8 Religious Factors

Beliefs in supernatural forces within a community can profoundly shape the behaviors and choices of its members, including attitudes towards healthcare practices. Nsemo (2019) discovered that a reliance on divine intervention and waiting for God's provision during pregnancy significantly impacted the utilization of skilled delivery services. Moreover, the study revealed that Traditional Birth Attendants (TBAs) held a prominent role in maternal care, as women entrusted them with their pregnancies. TBAs often incorporated spiritual practices into their care, such as setting up prayer altars in delivery rooms and conducting prayers and fasting for pregnant women's protection and well-being, aiming to ensure safe deliveries (Nsemo, 2019).

2.2.9 Cultural and Personal Beliefs

Culture, religion: where one comes from traditional beliefs and practices as cultural background more often than not affect maternal care as beliefs, norms, morals and

values related to pregnancy and delivery influence health service uptake and delivery (Aluko et al., 2020).

Traditional practices that do not promote healthy behaviors in women in their reproductive age is a barrier to effective skilled delivery services Women whose cultural practices allow hospital delivery are more likely to use BP (Tolera et al., 2019).

Research carried out by Jacobs & Hyder (2020) revealed that most of African women value their cultural and traditional beliefs that influenced their place of delivery

In a study in Tanzania where minority of the women believed visiting a traditional birth attendant like what their mothers and relatives did, was considered enough and so no need to go to hospital. This was so because TBA's had been utilized by their parents since time immemorial ,thus would help them safely delivery (Shimpuku et al., 2021).

A study done in Ethiopia revealed that labor and child birth was considered a natural process sand therefore no need to go for SBA as God would sustain the women and their unborn children (Hailemariam et al., 2021)

In some community's pregnancy announcement was to be done together with a cleansing rite to married women. This was to prevent any misfortunes of pregnancy like miscarriages and bad women. This practice was carried out and passed from generation to generation and these made women not attend ANC clinic thereby hindering BP use (Sumankuuro et al., 2017)

2.2.10 Socio-Economic Status

Study done in India found that low socioeconomic state contributed to low use of skilled delivery services as majority of the women coming from a lower caste with high poverty level couldn't afford to pay for the health services (Sharma et al., 2019)

Income of the woman and spouse are key determinants of skilled delivery as found by Munguiko et al. (2019) in their study found out that a monthly income of eighty-three

dollars affected health service utilization negatively. This was so as the women found it necessary to prioritize other basic needs like food first.

2.3 Strategies to Increase Uptake of Skilled Deliveries

The study followed the concept of HBF to gather the possible strategies from the respondents during the baseline study as shown in the table 2.2 below.

Table 2.2: Variables and Possible Strategies

Variables	Definition	Possible intervention strategy
Perceived susceptibility	probability of an individual to contract a disease	Use of monitoring, simulation and personalization/tailoring strategies to help individuals develop accurate perceptions of own risk
Perceived severity	individual's convictions in the intensity of ailment and its adverse effects	Use systemic desensitization, vicarious reinforcement and biofeedback technique to help individuals develop a realistic perception of the consequences of a condition and recommended action
Perceived benefits	individual convictions and understanding that the effects could be positively be influenced by specific health action;	Use of gain –framed appeal and a positive reinforcement/reward mechanism to portray the potential benefits of adopting healthy behavior
Perceived barriers	person's perception of the strains hindering them from adhering a particular health-related action e.g. cost and difficulties	Teach problem solving and decision-making strategies to overcome the perceived barrier of enacting healthy behavior
Cue to action	determinants that that elicit health actions (both internal and external triggers that will prompt an individual to seek health care services)	Employ reminders and suggestion strategies as an external prompt to performing the target behavior
Self-efficacy	individual's conviction in own ability to perform an activity effectively	Motivation, supportive monitoring, reminders

Many studies have revealed that diverse strategies function in situations to motivate women to opt for skilled birth attendance. A model to enhance the integration and utilization of reproductive health in South Africa by Hope et al., (2014) proved working as utilization of the services tripled after evaluation. A study done in Ngabia found that using the three-delay model increased skilled delivery services (Ferguson

et al. 2020). A study done in west Ethiopia showed that use of checklist-based Box System Interventions (CBBSI) was effective versus the routine care on improving utilization of maternal health services in Northwest Ethiopia (Andargie et al., 2020)

2.3.1 Maternity Waiting Homes

A study in Liberia showed that Maternity waiting homes enhanced physical accessibility to maternity facilities and in turn led to improved skilled birth attendance and eventually, improved the outcomes of maternal and newborn health (Nabudere et al., 2013).

2.3.2 Sensitization on Health Insurance Cover

A study conducted in Cambodia demonstrated the effectiveness of implementing health equity funds and voucher schemes targeted at impoverished mothers. After conducting an operational analysis, the study observed a significant increase in skilled deliveries in the area where these strategies were introduced compared to other areas where they were not implemented (Jacobs et al., 2020).

In Togo, research indicated that having health insurance coverage was among the strategies that contributed to improved utilization and access to skilled delivery attendance. This finding suggests that health insurance plays a vital role in facilitating access to maternal healthcare services (Mati et al., 2018).

2.3.3 Communication (Information)

Communication enhances the envisioned audience's information and awareness of health matters, problem or resolutions, Influence client's views, beliefs, and mindsets that can lead to change of social norms, timely action taking, reinforcement of knowledge, attitudes, and behavior and refute fictions and fallacies associated with health issues (Siseho et al., 2023)

Communication programs can influence communities by promoting increased awareness of a health matter, changes in attitudes and beliefs, and support for desirable behaviors of an individual or a group (Siseho et al., 2023). Effective Communication

with women and their families is effective and responds to their needs and preferences, ensures Human rights are observed and the experience of care is dignified and respectful for every woman and newborn (Siseho et al., 2023)

Research carried out in settings with limited resources in Zanzibar revealed an increase in women giving birth with the assistance of skilled health personnel after mobile phone interventions were implemented (Lund et al., 2012). A study carried out in Nepal showed that use of mass media to influence women's information on risks associated with pregnancy and child birth, availability of skilled delivery services and promotion of advantages of health facility delivery has been in many countries and has proved to be effective in enhancing maternal and child health (Shifraw et al., 2016). A study carried out in southern Nigeria revealed that use of mobile phones greatly increased the use of skilled delivery services by women of child bearing age (Balogun et al., 2020).

Another study in South Asia revealed that educating and empowerment of women, and increased equity of women through participatory women's support group's strategies proved to improve the utilization of skilled delivery services (Bhowmik et al., 2020)

A study by Gamage et al., (2022) in southern Asia also proved that when women are given the correct information regarding the MNCH services, they tend to seek the skilled delivery services.

2.3.4 Community Midwifery and TBA Programme

In a study done in Kenya, TBAs were recruited to teach pregnant mothers on the need of delivering at a health facility for a little financial allowance for every pregnant mother they would bring to deliver in the health facility and after implementation of this strategy, there was a marked upsurge in skilled deliveries during the study period as compared to the same period preceding the intervention (Tomedi et al., 2013).

In the year 2005, the government of Kenya launched the community midwifery programme implementation whose main goal was to increase pregnant mother's access to skilled care during pregnancy and childbirth within the context of their communities

and after an evaluation of the programme the number of skilled deliveries had significantly increased (Mannah et al., 2014).a study done in three African countries revealed that people-centered community-oriented interventions improve skilled birth attendance (Edward et al., 2020).

Interfamily relationship where families take care and support other families was found to be a strategy to enhance skilled deliveries (Ghani et al., 2019)

2.3.5 Functional Referral System

Referral is defined as the process of directing someone to an alternative source of treatment, assistance, information or a decision. Functional referral where every woman and newborn with condition(s) that cannot be dealt with effectively with the available resources is appropriately directed to where the competences and facilities to handle the situation are available to ensure continuity of care for all pregnant women, mothers, and newborns (Siseho et al., 2023)

The facility can also refer a client back to the community level workers for observation and for management of minor health issues that does not require clinical care. Referral during antenatal period is essential to ensure that mothers diagnosed with high-risk pregnancies receive immediate and appropriate care in order to reduce maternal and newborn complications (Pembe et al.,2017) A functional referral system enables comprehensive management of individual health needs using the resources that are locally available. Health referral systems in developing nations across the various levels of health care delivery are poor, affecting the general performance of the health system hence contributing negatively to the health outcomes (Avoka et al., 2022). In developing countries, the challenges include, delays in referral completion, inadequate health information systems to capture referral data, inadequate transport arrangements as well as inadequately resourced referral centers (Avoka et al., 2022).

A study by Andrea et al., (2017) in Tanzania revealed that pregnant mothers decline referral because they feel that they were separated from their families and they have phobia of the unfamiliar health facility environment. The Kenya Health Policy 2012–2030 identified the importance of strengthening the referral system in Kenya as an

approach of ensuring competency in the health system and enhancing the health outcomes (MOH, 2013).

2.3.6 Male Involvement

Research conducted by Tokhi et al. (2018) underscored the significance of involving men in maternal health as a promising strategy to enhance maternal and child health outcomes. Similarly, a study conducted in southwest Uganda highlighted the importance of male involvement in various stages of pregnancy, labor, delivery, and postnatal care as a critical determinant of skilled delivery and an effective means of improving maternal and child health (Bagenda et al., 2021).

Furthermore, it has been suggested that birth preparedness and complication readiness counseling should extend to male partners to enhance their preparedness for supporting their spouses during childbirth (Santoso, 2020). Another study in southern Ethiopia, revealed a positive association between birth preparedness and complication readiness among husbands and subsequent skilled birth attendance by their partners (Yeshitila et al., 2022)

2.3.7 Community Participation

Community-based approach strategy is the mechanism by which households and communities have an active responsibility in health-related development issues. In 1978, 150 United Nations member states adopted the proposed “Health for All by the Year 2000” a strategy that specified the potential for communities was actively involved in health development to improve their own health conditions (Sakeah et al., 2021). The advantages of community participation include improved health outcomes, better responsive care, and people’s participation in treatment decisions and improvement of quality and safety in health care (Amentie, 2022). A Study on community involvement revealed that ANC mothers who were visited by community health agents during pregnancy period were nearly twice as likely to deliver at health facilities than those who were not visited (Tolera et al., 2019)

Studies have proved that community-based interventions such as the use of mobile technology and social franchises, recognition of community health workers (CHWs) as a formal cadre and the integration of community-based health services within PHC are vital strategies in improving maternal, neonatal, and child health (Khan et al., 2018).

Community involvement enables members of the community and various stakeholders to recognize their own needs and how these needs can be addressed, promoting a spirit of community ownership and accountability (Haricharan et al., 2021). A study by Marston et al., (2013) indicates that community participation as a strategy provides individuals to gain a sense that they could solve their own problems through conscientious deliberations and communal actions. Opinion leaders in a community and policymakers are very much effective in influencing changes of policies, outcomes, and services that influence actions of persons (Marston et al., 2020).

Community participation brings about the positive outcomes like increased community awareness of danger signs and complications of unskilled deliveries, and care-seeking behavior, improved transport to services and creating awareness to community members to use health data to identify and address barriers to skilled delivery services (Howard-Grabman et al., 2017).

Community participation brings about social accountability of the programme where all members bear the burden of supporting and owning the pregamme (Squires et al., 2020).

2.3.8 Birth Preparedness

Client preparedness is one strategy that will ensure the client is ready psychologically, physiological, physically and materially to withstand the process of labor and delivery and also seek skilled delivery services (Letose et al., 2020)**.**

2.3.9 Cost reduction and Community Financial Strengthening

A study done in rural India found that supporting the community by use of microfinance literacy helped the community to be financially able and this intern led to increased utilization of skilled delivery services (Ahmad et al., 2020)

A study done in Kenya found that introduction of free maternity services, Linda mama and UHC increased the utilization of skilled delivery services (Oyugi etal., 2023)

2.3.10 Conducive and Enabling Health Facilities

A study by Mukaka, (2019) indicated that availability of an enabling facility with essential physical resources, adequate water, sanitation and energy supplies, medicines, supplies and equipment for routine maternal and newborn care and management of complications was a good predictor for women to seek skilled delivery services

2.3.11 Respective Maternal Care

Health care workers should treat Women and newborns with respect and preservation of their human rights and dignity as well as providing every woman and her family emotional support that are sensitive to their needs and strengthens the woman's capability (Siseho et al., 2023)

2.3.12 Conducive Environment

Availability of essential physical resources with adequate water, sanitation and energy supplies, medicines, supplies and equipment for routine maternal and newborn care and management of complications safe for providing maternal and newborn care (Siseho et al., 2023)

2.3.13 Use of Integrated Strategies

Nelson et al. (2022) conducted a study revealing a significant increase in skilled attendance levels following the implementation of a combination of integrated strategies. These strategies included integrating Traditional Birth Attendants (TBAs)

into skilled healthcare systems, fostering community participation, reducing or eliminating accessibility charges, enhancing health system development and improvement, and ensuring affordability of health services.

Moreover, Sendo et al. (2021) noted that employing multiple strategies to enhance the uptake of skilled deliveries resulted in greater benefits. This suggests that a comprehensive approach involving various interventions may be more effective in improving maternal healthcare utilization.

In Ghana, research conducted by Adam et al. (2022) indicated that a collaborative community health promotion approach proved to be an effective strategy for enhancing rural health delivery and improving health outcomes in the country. This underscores the importance of community engagement and collaborative efforts in achieving positive health outcomes, particularly in rural settings.

2.4 Model Development

A model is defined as set of concepts and related theories that are integrated into a meaningful organization. Nursing care models provide an approach with regard to the organization and delivery of patient care. Nursing care models also exhibit the philosophical basis of patient care and the prevailing institutional processes (Anneli, 2013). Model development is one of the trademarks that prove the uniqueness of a profession as a body of expertise (Anneli, 2013)

Model development involves several steps. The first step being creation of a draft document for the purpose of initiating deliberations with the various interested parties (Parker et al., 2021). The principles of model development must be built on prevailing standards in the healthcare setting and must be established on some assumptions (Parker et al., 2021). Once the draft is developed, interested parties including policy makers and other key players in the skilled delivery services should be identified for inclusion in the initial feedback stage. The draft should then be presented to each group of interested parties and an explanation of its purpose is shared, feedback is then elicited from the participants reviewing the draft model. The changes from the

feedback should be made in accordance with the set guiding principles and assumptions (Collier & Lambert, 2019).

Intervention models are best developed through interdisciplinary team collaborations of all stakeholders hence maximizing the likelihood of intervention effectiveness by improving the fit with the target group's perceived needs and hence acceptability, practicality, evaluability, including the theorizing of causal pathways, and uptake by implementers and policymakers (Wight et al., 2015). Following a thorough literature review, the study found that there are several existing frameworks and guidance for the development of interventional models. as shown in Table 2.3 below

Table 2.3: Existing Frameworks and Guidance for Public Health Intervention Development

	Guidance/framework	Description	Possible limitations
1	Intervention mapping	Extremely rigorous and elaborate approach to intervention development through six steps	Individual, social-psychological orientation. Highly technical, prescriptive, can require years to implement, and difficult to operationalize
2	Conceptual framework for planning intervention-related research	Specifies nine steps in developing and evaluating public health Interventions	Conceptual framework for planning of intervention-related research Specifies nine steps in developing and evaluating public health interventions Insufficient detail in steps for operationalizing Insufficient detail in steps for operationalizing
3	PRECEDE–PROCEED model	Socioecological approach. Planning phase is PRECEDE; evaluation is-proceed. Extensively data driven and practical application.	May require great technical skill, time and money. Little detail on intervention development

	Guidance/framework	Description	Possible limitations
4	Framework for design and evaluation of complex interventions to improve health.	Useful guide to development of interventions within the context of healthcare services	Focus on healthcare not public health. Little detail on intervention development
5	MRC guidance for the development and evaluation of Complex interventions	Identifies three broad stages of intervention development: developing theory, modeling process and outcomes and assessing feasibility	Does not break down three stages any further. Primarily devoted to evaluation
6	Design for behavior change framework	For community development workers in low-income countries. Focuses on determinants, facilitators and barriers to intended behavior to plan behavior change projects strategically	Sequence of steps advocated in part illogical and some of the terminology confusing

Adopted from: Wight D, et al. J Epidemiology Community Health (2016)

Developing a model of care is crucial for several reasons, especially in healthcare settings. A model of care outlines the framework and approach that healthcare providers follow to deliver services and support patient well-being. Here are some key recommendations for why developing a model of care is important:

Patient-Centered Approach:

A well-defined model of care places the patient at the center, focusing on their needs, preferences, and outcomes. This helps in delivering personalized and holistic care that addresses the unique circumstances of each patient.

Consistency and Standardization:

Establishing a model of care promotes consistency in healthcare delivery. It helps standardize procedures, protocols, and best practices, reducing variability in patient treatment and improving overall quality of care.

Efficiency and Resource Utilization:

A model of care can streamline healthcare processes, making them more efficient. This can lead to better resource utilization, improved workflow, and reduced healthcare costs.

Interdisciplinary Collaboration:

Models of care often involve interdisciplinary collaboration, encouraging communication and coordination among healthcare professionals. This teamwork ensures that patients receive comprehensive and coordinated care, especially for complex medical conditions.

Evidence-Based Practices:

Developing a model of care allows healthcare providers to incorporate evidence-based practices into their approach. This ensures that treatments and interventions are supported by scientific research, leading to better patient outcomes.

Continuous Improvement:

A model of care provides a structured framework for ongoing evaluation and improvement. By regularly assessing outcomes and adjusting practices based on feedback and new research, healthcare providers can continuously enhance the quality of care they deliver.

Patient Safety

A well-defined model of care includes protocols and measures to enhance patient safety. Standardized processes, checklists, and guidelines contribute to reducing errors and adverse events, ultimately improving patient safety.

Adaptability to Changing Needs:

Healthcare is dynamic, and patient needs evolve over time. A model of care that is designed to be adaptable can respond to changes in healthcare trends, advancements in medical knowledge, and shifts in patient demographics.

Facilitation of Training and Education:

A clear model of care serves as an excellent foundation for training new healthcare professionals. It provides a structured framework for education and ensures that practitioners are aligned with the organization's mission and values.

Enhanced Communication with Patients:

Communicating the model of care to patients helps them understand what to expect from their healthcare experience. It promotes transparency, builds trust, and empowers patients to actively participate in their care.

In summary, developing a model of care is essential for optimizing healthcare delivery, improving patient outcomes, and ensuring that healthcare practices are aligned with the latest evidence and standards. It creates a roadmap for healthcare providers to deliver consistent, high-quality care in an efficient and patient-centered manner.

2.5 Summary of Literature Review and the Gaps Identified

The literature review identified significant gaps in the utilization of skilled delivery services among women of reproductive age in the study area, which were categorized into barriers and strategies. One major barrier identified was the poor perception of the quality of care provided by healthcare workers, coupled with inadequate interpersonal relationships between healthcare providers and clients. Despite possessing knowledge about skilled healthcare services, many women did not seek these services, highlighting a gap between knowledge and practice. Additionally, disparities in attitudes towards skilled delivery services were observed, with some women having positive attitudes while others viewed them as time-consuming.

Other hindrances to utilization included the poor care environment, religious and cultural factors, delays in seeking and receiving healthcare, parity, and socioeconomic status. On the other hand, various strategies were identified to enhance utilization, including maternity waiting homes, sensitization on available health insurance covers, community midwifery services, and communication on the importance of individual birth plans, male involvement in reproductive health, community participation, functional referral systems, and financial support.

Furthermore, enhancing communication, promoting good interpersonal relationships among healthcare workers, ensuring conducive care environments, and employing integrated strategies were found to be crucial. However, the literature review did not uncover evidence of an existing care model tailored to address the issue of unskilled deliveries in the study area, indicating a notable gap in interventions.

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CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter covers the research design, process, method of data collection and data analysis methods used in this study. It also describes how the objectives of this study were achieved in the two study phases, namely: Phase I - Model development and Phase II- Testing of the model. Table 3.1 shows the phases and steps utilized.

Table 3.1: Steps of Each Study Phase

Phase	Step	Activity	Outcome
1- model development	1	Review of existing literature	Identification of existing gaps
	2	Selecting of a suitable design	Mixed method Cross-sectional design selected
	3	Development of tools	Questionnaires, KII, FGD checklists
	4	Recruitment of qualified research assistant	Research team constituted 12 research assistants and one data clerk
	5	Pretesting of data collection tools for validation	Validated tools
	6	Baseline data collection	Raw data
	7	Data analysis	Analyzed data
	8	Model development	Draft model
	9	Model validation by the experts	Final validated model
2- model testing	1	Application of the model	Testing of the model
	2	Data collection	Raw data
	3	Data analysis	Analyzed data
	4	Hypothesis testing	Reject or fail to reject the hypotheses

3.2 Research Design

In this study, various designs were utilized as per the specific study phase. In Phase I, a descriptive cross sectional study design was used to answer research questions 1to 3 while in Phase II, Quasi experimental (nonequivalent) study design was used to answer question 4 of this study. The study was community based utilizing the structures and of community health strategy.

3.2.1 Research Design for Phase One – Development of Model of Care

A mixed method approach was adopted. Descriptive cross-sectional study design was utilized during baseline study to generate information in respect to experiences of skilled delivery among women of reproductive age in Kandara Sub-County. Justification of using this design is that it allows collection of the information at a particular point of time hence showing the situation of the status as it is. The research team gathered information from women, CHVS, CHEWS and health administrators that aided in generation of strategies utilized in designing a model of care (Moc).

3.2.2 Research Design for Phase Two - Testing of the Model of Care

Quasi-experimental study (an intervention study design) was used to test the developed model of care. A quasi-experiment is an empirical interventional study used to estimate the causal impact of an intervention on target population without random assignment (Thomas, 2022). Interventional studies are specifically designed to evaluate direct impact of therapeutic or preventive measures on outcomes by assigning participants into treatment/intervention or control/ comparison group (Thakur, & Shah, 2021).

Faudjar et al. (2020), developed a comprehensive digital tool for primary care and used a quasi-experimental study to evaluate it by comparing 2 communities. Mitchel et., al (2020), assessed one group before and after they gained access to an application that gives incentives for engaging in physical activity. Peyman et al, (2018), did a study to evaluate the impact of digital health on promoting physical activity in women where eight active health centers were randomly selected to the intervention and control.

After a thorough literature review, this study adopted a posttest only nonequivalent groups design**.** In this design, participants in one group (interventional) are exposed to a treatment, a nonequivalent group (comparison), is not exposed to the treatment and then the two groups are compared at the end of intervention period (Thomas, 2022).

For academic purpose as well as considering the feasibility of this study in terms of time frame, funding, Government policies and stakeholder's needs, the researcher tested the model on a small number of clients to assess its effectiveness. Thereafter, it was submitted to stakeholders and relevant government's bodies for full implementation and evaluation and possible adoption into the health system. The study participants were assigned into either intervention group or comparison group. The intervention group had the strategies in the model of care applied on them using the components of theory of change while the comparison group received the normal standard ANC clinic without intervention. These two groups were then followed prospectively for three months to term and a home visit was carried out postnatally to determine where each of them had delivered as a way of testing the effectiveness of the model. Table 3.2 below shows the general outline of phase 2.

Table 3.2: General Outline of Phase Two

Group	Area	Number of respondents	Intervention	Follow-up	Posttest
Intervention group	Ngararia ward	77	Yes	Yes	Yes
Comparison group	Gaichanjiru ward	77	No	Yes	Yes

3.2.3 Study Area

The study area (Kandara Sub-County) is one of the seven Sub Counties in Murang'a County. It covers an area of 235 km^2 and is located about 45km to the north of Nairobi. It borders the following Sub Counties Kigumo to the North, Maragua to the East and Gatanga to the south. It is sub divided in to three administrative divisions namely, Kandara, Gaichanjiru and Githumu and further into six electoral wards namely: Ng'araria, Muruka, Kagundu-Ini, Gaichanjiru, Ithiru, and Ruchu Wards.

The 2020 population is 175098 (86698 males and 88393 females) with a male to female sex ratio of 48:52 respectively. The number of women of reproductive age stands at 2,121 and the number of expected deliveries is 2,121 (KNBS, 2022). The WRA population per ward is shown in the Table 3.3 below.

Table 3 3: Number of Women of Reproductive Age per Ward

Ward	No. of women of reproductive age
Ruchu	20,215*2.4/100= 485
Muruka	13115*2.4/100= 315
Kagunduini	18431*2.4/100 = 442
Gaichanjiru	11738*2.4/100= 282
Ithiru	14315*2.4/100 = 343
Ngararia	10579*2.4/100= 254
Total Sub-County population	88393*2.4/100= 2121

Kandara Sub-County contributes the highest percentage of home deliveries at 35% this surpasses the national and global targets of 0% (KNBS, 2015). This was the main reason for the choice of Kandara Sub-County as the study area.

In matters of health services, the area is served by 23 public health facilities; five faith-based facilities and four private health facilities. Only three of the health facilities offer comprehensive obstetric care namely: Kandara Sub-County hospital, Gaichanjiru mission hospital and Githumu mission hospital. All other facilities offer primary health care including ANC and CWC services as far as maternal childcare is concerned,

In terms of community strategy, the Sub-County has well established CHUs, which are supervised by the Sub-County community strategy coordinator. The coordinator is the overall in charge of all community health extension workers (CHEW). The CHEW heads each ward supervising community health volunteers (CHVs) serving at the community health units (CHUs) in the entire ward. Each community health unit covers 100 households and is linked to the nearest local health facility for referral purposes and the replenishment of supplies. Total distribution is as shown on the Table 3.4 below.

Table 3 4: Distribution of Households, CHVs and CHEWs

Ward	No. of Active CUs	No. of households	No of CHVS	NO of chews
Ruchu Ward	7	700	70	1
Muruka Ward	4	400	40	2
Kagunduini Ward	5	500	50	2
Gaichanjiru Ward	6	600	60	2
Ithiru Ward	6	600	60	2
Ngararia Ward	2	200	20	1
Total	**30**	**3000**	**300**	**10**

The Sub-County has a good transport and communication network with tarmac and Murom roads. Small-scale farming, small and medium enterprises and animal rearing are the main economic activities within the study area.

3.3 Study Population

This study used different populations as per specific phase as indicated below;

3.3.1 Study Population for Phase One

Women of reproductive age (15-49 years) with a recent delivery (within 1 year), Community Health Volunteers (CHV's), Community Extension Workers (CHEWS) and local facility health administrators formed part of the study population for this phase of study.

3.3.2 Study Population for PHASE II

The projected total population (N) at the time of the study was 555 pregnant women

3.4 Inclusion/Exclusion Criteria

3.4.1 Inclusion Criteria: Phase One

- All women of reproductive age who had delivered in the last one year because of recall memory such women are more likely to remember what transpired during the last delivery and the scope of study

- Women who had lived in the area over the last one year. They were deemed to be residents of Kandara Sub-county thus well conversant with the maternal health issues within their area.
- CHEWs and CHVs who had worked in Kandara Sub-County for the last 6months- they are deemed to be conversant with the community health issues

3.4.2 Inclusion Criteria for Phase Two

- All the women of reproductive age in their third trimester gestation (28 weeks)

3.4.3 Exclusion Criteria: Phase One

- Women of unsound Mind
- Underage pregnant girls (<15, years)
- Newly employed CHEWS and CHVS

3.4.4 Exclusion criteria for Phase two

- Underage pregnant girls (<15, years) as the legally cannot consent for a study
- Women of unsound Mind

3.5 Sample Size Determination

The sample size is an important feature of any empirical study in whose aim is to generalize about a population. It is determined based on the cost, time, or convenience of collecting the data, and the need for it to offer sufficient statistical power (Israel, 2018).

3.5.1 Sample Size for Phase One

3.5.1.1 Sample Size for Women

The total number (N) at the time of study projected was 2,121 women.

The Sample size, (n) for a population, which is more than 10,000, was calculated using the Fisher's formula as follows, according to Kasiu et al. (2006).

Equation 3.1: Fisher's Formula

Fisher's Formular

$$n = \frac{Z^2 pq}{d^2}$$

n = sample size

z = standard normal deviate corresponding to 95% confidence level (1.96)

Confidence interval = 1.96

p = proportion of the target population, with the characteristics of interest

q = 1-Pd = precision set at ±0.05

= $(1.96)^2(0.6x0.4) / (0.05)2=368.793$

= 368.79, which are 369 (rounded to the nearest figure

Since a population less than 10,000, the desired sample size was calculated using formula indicated below;

Equation 3.2: Calculation of Sample in a Population Less than 10.000

$$nf = \frac{n}{1 + \frac{n}{N}}$$

N= study population is 2121.

n = 369

369 = 314.57 therefore, the sample size, (no) was 315.

1+369 / 2121

The sample size 315 + (32, (10% contingency) = 347 respondents

The above sample size was distributed in the community units based on proportionate computation per ward to ensure representation by weighing the wards as per the Table 3.5 below

Table 3.5: Proportionate Sample per Ward

Ward	No. of CU	No. of expected delivery in the last 12 months	Computation	Proportionate sample size
Ruchu Ward	7	21025*2.4/100= 505	505x347 2121	83
Muruka Ward	4	13115*2.4/100=315	315 x 347 2121	52
Kagunduini Ward	5	16,3021*2.4/100= 392	392 x 347 2121	64
Gaichanjiru Ward	6	12388*2.4/100 =298	298x 347 2121	49
Ithiru Ward	6	14315*2.4/100 =343	343 x 347 2121	56
Ngararia Ward	2	10679*2.4/100 =256	256 x 347 2121	43
Total	30	88393*2.4/100 2121		347
Total sample size				**347**

3.5.1.2 Sample Size for CHVS, CHEWS and Health Administrators

According to Guest al, (2016), conducting three to six focus groups with 8-12 participants per group is sufficient to capture 90% of themes (saturation) in a homogenous study population. The research team conducted six Focus Group Discussion (FGD) sessions, each involving eight participants, after which information saturation was achieved. A total of 48 Community Health Volunteers (CHVs) were selected using a simple random sampling method to represent all Community Health Units (CHUs).

All ten Community Health Extension Workers (CHEWs) responsible for supervising the Community Units (CUs) in the sub-county participated in the study through a census method. A total of seven health administrators participated in the study, including two administrators from each of the three sampled health facilities

(comprising the medical superintendent and nurse administrator), as well as the sub-county public health nurse. The selection of participants was done purposefully.

3.5.2 Sample Size for Phase Two

According to Alahdab et al., (2018), the required sample size to test a hypothesis is governed by the effect size. A satisfactory sample size and power is required to enable generalization of the conclusions generated from the study. In this phase of the study, pregnant women in their third trimester from the sampled community units were sampled whereby 154 sample in a ratio of 1:1(77 women were purposefully assigned to the study group and the rest 77 to the comparison group).The population sample in this Phase 2 was derived from both the health facilities ANC registers where the CHU of origin was traced and the CHV data of CHUs with pregnant women to ensure the entire eligible women in the study area were included in the study to avoid selection bias. The research adopted a Single Blinded Trial where only the research team was aware of those individuals assigned to interventional or comparison group to ensure the validity, reliability and unbiased outcome of results. The geographical distance between the two wards was considered to ensure no contamination of respondents during intervention

Sample size calculation for phase 2 was determined as follows:

Equation 3.3: Comparison of Proportions between Two Groups (Binary)

The study adopted the formula by Wang & Chow, (2007) to calculate the sample size for phase 2

The number of participants per group required to detect a difference p1 − p2 in the proportions with significance level α and power 1 − β is given by

$n = (Z_{\alpha/2}+Z_{\beta})^2 \times (p_1(1-p_1) + p_2(1-p_2)) / (p_1-p_2)^2$

$Z\alpha/2$ = the critical value of the Normal distribution at $\alpha/2$ (for a confidence level of 95%, α is 0.05) =1.96

$Z\beta$ = the critical value of the Normal distribution at β (for a power of 80%, β is 0.2) = 0.84

p1 = the expected sample proportion of pregnant women in the control group = 65% = 0.65

p2 = the expected sample proportion of pregnant women in the intervention group = 85% = 0.85

ratio1:1 (Intervention: control group)

where:

$n = (Z_{\alpha/2}+Z_{\beta})^2 \times (p_1(1-p_1) + p_2(1-p_2)) / (p_1-p_2)^2$

$n= (1.96+0.84)^2*(0.85(1-0.85) +0.65(1-0.65))/0.85-0.65)^2$

Table 3.6: Sample Size

Sample size	
2-side significance level	0.05
Power (1-beta)	0.84
Ratio of sample size, interventional/comparison	1
Probability of event in the exposed group(p1)	0.85
Probability of event in the unexposed group (p2)	0.65
Result	
Sample Size – exposed group	70
Sample Size – Comparison group	70
Sample size for the two groups (n1+n2)	140
Attrition rate (10%)	14
Total sample size	154
Participants per wing (ratio of 1:1)	77

Total number of participants =154

3.6 Sampling Procedure

3.6.1 Sampling Procedure for Phase I

The study was carried in all the six wards of the Sub-County. The number of women interviewed in every ward was proportionately calculated from the Sub-County population. A proportionate sample of the CHUs to participate in the study was calculated per ward, in each sampled CHU, a list of the homesteads with a mother who had delivered in the past 12 months was obtained from MOH 513 register (homestead

mapping register). Random sampling by use of random table was utilized to select the homestead with a woman who had delivered within 12 months prior to the study. Study respondents were purposefully sampled from homesteads mapped with a mother who had delivered within the last 12 months. In case the sampled respondent was not available or refused to participate, the researcher went on and randomly picked another homestead from the list until the desired sample size was achieved (N=347). Simple random method was employed to identify the CVH's, Census sampling method was used to identify CHEWs while purposeful sampling method was used for local health facility administrators.

3.6.2 Sampling Procedure for Phase 2

After the baseline study, Ngararia and Gaichanjiru wards were purposely chosen due to their low skilled delivery rates ie,25 (58%) and 22 (45%) respectively. Ngararia was assigned as the "intervention group," and Gaichanjiru as the "comparison group." Proportionate Random Sampling was employed to select Community Health Units (CHUs) in both wards. Simple Random Sampling (random table) was used to sample households with third-trimester pregnant women (from 28 weeks). Pregnant women with a gestation of 28 weeks from the selected households were purposefully recruited. If a woman declined to participate, the researcher moved on to the next sampled household until the required sample size was achieved.

3.7 Data Collection

3.7.1 Data Collection Team

The team composed of the primary researcher supported by 12 (2 per ward) research assistants with training in health sciences and who had a past experience of participation in scientific research data collection and management with a minimum bachelor's degree qualification in community health nursing and one data entry clerk with bachelor's degree in health records and information technology. After drawing and agreeing on the terms of engagement with the research assistants and the data entry clerk, the researcher conducted a three-day training to induct them on the proposed study process until they demonstrated good understanding of the entire process. The

researcher used the same team members during the two phases of the study with a justification that they had become conversant with the entire process of the study hence required a little orientation in each phase after the initial training.

3.7.2 Data Collection Tools for Phase I

Different tools were used for the purposes of data collection in phase I of the study. Semi structured questionnaires were used to collect data from eligible women, Focused Group Discussions (FGDs) were used on CHV's and women groups while Key In-depth interviews were applied on the CHEWS and health facility administrators.

3.7.2.1 Study Questionnaires

Contained both open and closed ended questions. The questions were separated into different parts in order to exhaustively produce the required information from the mothers who gave birth in the last 12 months. The different sections in the questionnaire were as per the study variables. The questionnaires contained introductory part, the consent form and the questions to be responded by the study respondents.

3.7.2.2 Focused Group Discussions (FGDs)

The researcher used a discussion guide as a tool to gather information from focused group discussions (FGDs). This guide provided a structured framework of questions and topics to guide the conversation and maintain consistency across FGD sessions. It consisted of open-ended questions that encouraged participants to share their opinions, experiences, and perspectives on the topic. The researcher acted as a moderator, facilitating the discussion and ensuring all participants had the opportunity to contribute. With participants' consent, audio recording equipment was utilized to capture the FGD sessions and also critical notes were taken.

3.7.2.3 KIIs

The researcher used an interview guide consisting of structured questions and prompts to gather information from key informants. The interviews were conducted

individually with ten CHEWs and seven health administrators from local health facilities. The interview guide included a combination of open-ended and closed-ended questions, as well as probes for further exploration. Audio recordings and note-taking were used to capture participants' inputs accurately. The researcher used an interview guide consisting of structured questions and prompts to gather information from key informants. The interviews were conducted individually with ten CHEWs and seven health administrators from local health facilities. The interview guide included a combination of open-ended and closed-ended questions, as well as probes for further exploration. Audio recordings and note-taking were used to capture participants' inputs accurately. This approach ensured systematic coverage of relevant areas

3.7.3 Data Collection Tools for Phase 2

A structured questionnaire was used to collect the data with a set of both open and closed ended questions. The questionnaire was separated into different parts in order to exhaustively produce the required information to determine if each respondent had a skilled delivery or not and the factors that may have influenced the type of delivery. The different sections in the questionnaire were as per the study variables.

3.8 Validity and Reliability of Data Collection Tool (s)

3.8.1 Validity

Validity is defined as degree to which a tool measures what it was expected to measure. There are diverse types of validity, which include:

3.8.1.1 Content Validity

It assesses the degree to which the test indicators endeavor to measure different qualities of the concepts in question. In this study, the researcher worked closely with the reproductive health teams at the county and subcounty level to critique the tools after which they gave their feedbacks on how each question measured the construct and later tools were adjusted appropriately for the study.

3.8.1.2 Face Validity

It helps the researcher to ascertain whether the data collection tool was able to test the projected concepts being researched. In this research, the researcher ensured that the data collection tools were re-evaluated by the research team and all the ambiguities and inconsistencies were addressed accordingly before embarking on data collection.

3.8.1.3 Construct Validity

It examined how well a data-gathering tool confers to the theoretical prospects of the study. It looked for conformity between a theoretical concept and a particular measuring tool or procedure. In this particular research, pre-testing of tools was undertaken in Kigumo Sub-County to test the steadiness of internal data and the reliability of the standards of variable measurements. Pretesting aided the research team to rectify all ambiguities of the questions, ensured clarity of the questions and instructions, hence helped the researcher to evaluate the scope of the research project and also aided in assessing the time participants could spend to answer the questions. The researcher carried out a pretest in Kigumo Sub-County as the two sub counties share common characteristics as in terms of population, cultural beliefs, climate and health infrastructure. The necessary adjustments were then undertaken on the tools by the researcher. The new revised version was applied for data collection in the main study.

3.8.1.5 Criterion- Related Validity

This type of validity helps to discover the presence or absence of one or more standards deemed to represent some constructs of interest for any given research. To examine this type of validity, the researcher administered the tools during pre-testing to the selected respondents. Propositions from the participants were incorporated in the final tool.

3.8.2 Reliability

Reliability is defined as the degree to which a research tool is able to yield comparable results on recurrent trials, thus replication of the study (Polit and Beck, 2021).

Cronbach's alpha (α) was calculated by linking the score for every after-data collection, reliability test was conducted for all the subscale in the respondents' questionnaire using Cronbach's alpha. In this case, an alpha of 0.7 or above was deemed as acceptable. The test was carried out to determine whether the responses provided by the respondents adequately addressed each item on the sub scale. Cronbach's alpha is a measure used to examine the reliability and internal stability of a series of test items directed by the guidelines and interpretation as shown in Table 3.7 below.

Table 3.7: Cronbach's Interpretation

Cronbach's alpha (α)	Interpretation
greater than 0.9	Excellent
greater than 0.8	Good
greater than 0.7	Acceptable
0.6 and 0.7	Questionable
Between 0.5 and 0.6	Poor

Adopted from George and Mallery 2003)

The data from the pretest was gathered from 44 (10%) participants who were randomly selected and the findings of the Cronbach's alpha (α) test for every item in the questionnaire denoted and interpreted.

3.9 Data Collection Procedure

The study followed the two phases described below.

3.9.1 Data Collection Procedure for Phase I

This phase took place from start of January to end of March 2022. Both qualitative and quantitative data from women, CHVs and administrators of health facilities in the community were collected.

Quantitative Data

Data was gathered by use of semi structured questionnaires amounting to a total number of 344 respondents.

Key Informant Interviews

The researcher conducted individual in-depth interviews with ten (10) CHEWs and seven (7) health administrators of local health facilities to provide information about their perceptions and experiences of the community with regard to the utilization of skilled birth attendance services. Experience of women of reproductive age in the study area with regards to the utilization of skilled birth attendance services.

Focused Group Discussions

The researcher conducted 12 FGD sessions per ward comprising of 8 participants per each (6 for women of reproductive age and 6 for CHVS. According to Guest al, (2016), conducting three to six focus groups with 8-12 participants per group is sufficient to capture 90% of themes (saturation) in a homogenous study population. Each Focus Group Discussion (FGD) session consisted of eight participants, after which information saturation was achieved. The sampled participants were taken through the tool while clarifying any issues that would arise during the induction process. The information gathered was analyzed and the research findings contributed to strategies used in development of a model of care.

3.9.2 Data Collection Procedure for Phase 2

The recruitment of the participants started in October 2022 and was accomplished in early November 2022. The two groups were then followed prospectively for three months to term (from November2022 to early February 2023) and eventually a home visit was done postnatally to determine where each woman had delivered as a way of testing the effectiveness of the model of care.

Recruitment of participants commenced in October 2022 and concluded in early November 2022. Subsequently, the two groups were prospectively followed for three months, spanning from November 2022 to early February 22024 as indicated by Anglin et al. (2020) and Cebula (2018), as depicted in Table 3.8. After the intervention at time t+1, a postnatal home visit was conducted between late January and February

2024 to determine the delivery location of each woman, this served as a means to assess the effectiveness of the care model

Table 3.8: Data Collection Process for Phase 2

Pre intervention	Intervention	Post intervention
t-1 (baseline)	Strategy implementation Nov 2022 – Jan 2023 (t= 3 months)	t+1 (End line) January, 2023,

t – Specified time

The sampled respondents in both the intervention and comparison groups were followed for three months until they delivered and then a comparison analysis on where each woman delivered was undertaken by use of questionnaire.

3.10 Data Analysis

This involved organizing and coming out with meaningful structure from a data gathered from the research. The method utilized in the study guided the researcher in identifying the approach of data analysis (Kellar and Kelvin, 2013). In this study, the collected qualitative and quantitative data was analyzed as per the phase of the study.

3.10.1 Data Analysis for Phase One

3.10.1.1 Quantitative Data Analysis

Descriptive Statistics was used where data was coded, entered and cleaned before it was analyzed using SPSS version 27. Tabulation of continuous data was done using measures of central tendency. Analyzed data was then presented in charts, tables and figures.

3.10.1.2 Qualitative Data Analysis

- ✓ This study adopted an inductive thematic data analysis (a data-driven approach where themes are identified through an in-depth examination of the data itself, without preconceived notions or hypotheses) and followed the following

process adopted from (Saldaña, 2020). NVivo version 13.0 was used for Inductive Thematic Analysis.

1. **Review of research questions**: The research team begun by reviewing the research questions as a guidance
2. **Reading**: The research team began with reading and re-reading texts and reviewing notes and transcripts from each made summary memos translated Kikuyu transcripts into English transcriptions and also it also read all the transcription against the Kikuyu audios to ensure no distortion of the meaning.
3. **Coding: Identifying the emerging themes**

In this study, the coding served as a way of patterning, classifying, and later reorganizing each datum into categories and themes for further analysis. Transcripts were prepared in the MS Word document format and imported to the NVIVO qualitative data analysis software as a primary document, assigned them labels by code list.

4. **Coming up with a theme- broad topic of information**

In this step, information in the labels of code list was carefully and closely examined and collated and a broad topic of information (theme) developed. The researcher addressed this phase by developing detailed memos with respect to each main code list after examining the evidence from the data that supported each theme qualitatively.

3.10.1.1 Data Analysis for Phase Two

This study adopted the Two Proportion Z-Test - a statistical test used to determine if the proportions of categories in two group variables significantly differ from each other. In this study utilization of skilled deliveries between the interventional group and the comparison group was assessed. The study had a significance level (α or alpha) set at 0.05 meaning that if the p-value is less than or equal to the significance level of 0.05, then the decision to reject the null hypothesis is made. If, however, the p-value is greater than the significance level of 0.05, then the decision not to reject the null hypothesis is made. The study used SPSS version 27 to calculate z-score.

3.11 Data Presentation

3.11.1 Data Presentation for Phase One

Bar graphs, Frequency tables, pie charts, cross tabulation and narrations were used to present data in phase1 of the study.

3.11.2 Data Presentation for Phase Two

Descriptive Statistics tables, and test statistics tables were used for data presentation

3.11.3 Triangulation of Analyzed Data

According to Polit and Beck (2021), triangulation refers to the use of multiple referents to draw conclusions about empirical evidence. Data triangulation involves the use of multiple data sources. In this study, the researcher collected data from different sources to gather data about the same phenomenon being investigated as methodological triangulation. As part of the theory triangulation, the study utilized a variety of literature.

3.12 Steps of Model Development Process

Study findings from baseline study and extensive literature review guided the identification of the strategies to develop a model of care. The components of theory of change (inputs, activities, outputs and the outcomes) guided the researcher to come up with a model of care.

The research adopted eight steps in model development adopted from Havenga, et al, (2014). As indicated in Table 3.9 below.

Table 3.9: Steps of Model Development

Step	Objective
1	Objective of the model
2	Scope of the model
3	Evidence results from the baseline study
4	Identified themes and categories
5	Development of draft model of care
6	Expert review and opinion-(validation)-Recommendations effected
7	Testing of the validated model
8	Presentation of the developed model for adoption and implementation

Adopted from Havenga, et. al. (2014).

3.12.1 Step 1: Objective of Model Development

The purpose of the model was to provide guidance based on evidence to improve the utilization of skilled birth attendance services in Kandara Sub-County Kenya. While the objective of the study was to describe the strategies that would aid to overcome the problems and challenges of utilization of skilled birth attendance services in the study area.

The purpose of the model was to provide guidance based on evidence to improve the utilization of skilled birth attendance services in Kandara Sub-County Kenya while the objective of the study objective was to describe the strategies that would help to overcome the problems and challenges in the study area as far as utilization of skilled birth attendance services is concerned.

3.12.2 Step 2: Scope of the Model

The model was to be implemented in the communities and the health facilities in the study area and also in the republic of Kenya at large in planning, implementation, monitoring and evaluation of skilled birth attendance services. The targeted users of the proposed model are: community members, health care workers, health managers, and health policy makers.

3.12.3 Step 3: Evidence from Base Line Study

A baseline study was conducted between January and March 2022 and the research findings yielded to problems and strategies. The strategies were used as evidence to develop the model of care.

3.12.4 Step 4: Identified Themes and Categories.

The data analysis yielded to one main theme named: “Strategies” which was further categorized in to four categories namely: individual, interpersonal, community and government levels.

3.12.5 Step 5: Development of Draft Model of Care

The strategies from the data analysis were used to come up with a draft model of care.

3.12.6 Step 6: Model Validation (Expert Review and Opinion)

Validation is defined as the confirmation, through the provision of objective evidence that the requirements for a specific intended use or application have been fulfilled (Lecours, 2020). Model validation is an important part of the overall model development process whose main purpose is to check its accuracy and performance (Oliveira & Costa, 2021).

Validation is directly related to the interested parties’ requirements, such as the accuracy of clinical decision required by the patients whose goal is to confirm, based on data, that the requirements for its use have been fulfilled (Jorm, 2015). It ensures that the model meets its intended requirements in terms of the methods employed and the results obtained (Umar et al., 2020). The ultimate goal of model validation is to make the model useful in the sense that the model addresses the right problem, provides accurate information about the system being modeled, and to make the model actually used (Peter, 2021)

Model validity should be evaluated both operationally (by determining if model output agrees with observed data) and conceptually (by determining whether the theory and assumptions underlying the model are justifiable (Garcia Gonzalez, 2021).

The process of validation of the developed model took place from19th October to 2nd November 2022.The study adopted the eight core validation principles defined by

the North American Chief Risk Officers (CRO) Council of model validation (Collier & Lambert, 2019) as indicated in Table 3.10.

Table 3.10: North American Chief Risk Officers (CRO) Council of Model Validation

S/N	Principle	Action Taken by The Researcher
1	Model design and build is consistent with its intended purpose	The researcher clearly defined the problem being solved by the model
2	independent model validation process	The researcher selected an independent model validation team with expertise in reproductive health issues
3	Designate an owner of the validation process	The primary researcher bore the entire responsibility for making important decisions and ensuring the process followed the core principles
4	Ensure appropriateness of established model governance	The primary researcher provided the validation team with the model validation governance framework for review taking into consideration the complexity and importance of the model.
5	Make validation efforts proportional to areas of materiality and complexity	The researcher provided accurate output. Components of the model
6	Validate the model components (input, calculation, and output)	This is the central purpose of the validation process **Input**: Expert judgment was used to validate any assumptions **Calculation**: sensitivity testing and dynamic validation provided assurance of the stability and reasonableness of the calculations. **Output**: presentation of results was clear for consistency.
7	Address limitations of model validation	The researcher gave the validation team two weeks to submit their scores and also kept on calling them to remind them on the process and timeline.
8	Document the model validation	The researcher documented the key findings, and limitations of the validation process, and recommendations given to improve the model

The validation process followed the 6 steps of Model Validation and Testing: A Step-by-Step Guide by Peter Grant (2021) as indicated on Table 3.11.

Table 3.11: Steps of Model Validation by Experts

Step	Activity	Outcome
1	Elaborate selection criteria for scientific and professional experts	Selected experts
2	make scientific and professional experts list	List of selected experts
3	Contact scientific and professional experts	Email address of the experts
4	Administrates questionnaires (model evaluation criterium)	Acceptance by experts to participate Clarity of the components of the model to be evaluated
5	Synthesize answers	determination of the consensus of experts about the different components of the model
6	Final analysis and publication	summary of the results

Adopted from Peter Grant (2021) Model Validation and Testing: A Step-by-Step Guide

3.12.6.1 Elaborate Selection Criteria for Scientific and Professional Experts

Literature review revealed that most of studies in health field recommends including professionals in the panel of experts and the Work experience in the field of health (Sepehrvand et al., 2019). The study opted for professional expertise as the main criterion for selecting the experts as guided by Keane & McKeown (2020) who claimed that an expert is an appropriately qualified person who may state their opinion on a matter calling for the expertise that they possess. Experts give noble information regarding the area of their expertise (Watson, 2022).

3.12.6.2 Make Scientific and Professional Experts List

Literature reveals that no actual number of experts that must be included however, most of the studies recommend 6-10 experts (Khoiriyah et al., 2015). The researcher submitted the draft model to 10 health experts for verification and validation. The Table 3.12 below shows the characteristics of the health experts used for validation of the model.

Table 3.12: Characteristics of the Health Experts.

Expert number	Qualification	occupation	Area of specialization
1	PhD	Senior Lecture	Midwifery
2	PhD	Senior lecturer	Epidemiology
3	Masters	Medical	Obs/Gynecology
4	Masters	midwife	Midwifery
5	Masters	midwife	Midwifery
6	Masters	midwife	Midwifery
7	Masters	midwife	Midwifery
8	Masters	lecturer	Midwifery
9	Masters	midwife	Midwifery
10	Masters	Medical doctor	Obs/gynae

3.12.6.3 Contact Scientific and Professional Experts

The researcher reached out to the experts using their email addresses, providing details such as the study description, reasons for selecting them, consultation procedures, estimated time commitment, and expectation (Dari et al., 2019)

Phone calls were subsequently utilized to remind the experts about the time frame.

3.12.6.4 Administrate Questionnaires (Criterion for Gathering Evidence of Model Credibility)

The study utilized a set of criteria for collecting evidence of model credibility, drawing from the works of Parady et al. (2021) and Kopec et al. (2010). The researcher distributed this evaluation criterion, along with necessary information for critique, to the experts, inviting them to share their opinions on the subject under study. The intention behind providing these criteria was to facilitate the experts in providing their opinions and recommendations regarding the study subject (Lecours, 2020). Table 3.13 below displays the criterion and its components.

Table 3.13: Criteria for Gathering Evidence for Model Credibility

S/N	Criterion
1	**Clarity and presentation** -Is the Model precise, simple and easily understandable?
2	**Specificity** -Is the Model being specific and focused on improving the utilization of skilled birth attendance services?
3	**Reliability** -Can the model ideally be used consistently in other in similar circumstances?
4	**Clinical Flexibility**-Are Exceptions of the model identified?
5	**Effectiveness** -Is the model able to meet the needs and to solve the problems identified by the study findings?
6	**Validity** - Is the model based on evidence from correctly analyzed and interpreted data?
7	**Relevance:** Is the model appropriate for improving the utilization of skilled birth attendance services?
8	**Applicability:** Is the module applicable in the given scope?
9	**Acceptability:** realistic and ambitious, in line with the existing maternal health strategies.
10	**Achievability**: could be done by the target group as described in this study
11	Utilization review: indications of ways in which adherence may be monitored, were explained as operationalization of the strategies
12	**Out Plausibility:** Does the theory present a plausible solution to a problem? Is it reasonable to believe that if that path is chosen, this will represent a change, by reducing or eliminating the problem?
13	**Model content and structure**: Are linkages depicted in the diagram logically connected? Are there any gaps in the logic or any breakdowns in temporal sequencing?
14	**Linkages of the model with existing theories:** Is there sufficient research-based theory that supports the logic and linkages?

Adopted from (Parady et al., 2021; Kopec et al., 2010)

3.12.6.5 Synthesis of Answers

The research implemented the scoring model proposed by Bascom et al. (2018) to assess and categorize scores. Instances where scores were 2 or below were considered as unsatisfactory and consequently dropped from further consideration. Scores of 3 underwent modifications based on expert opinions and recommendations. On the other hand, scores of 4 and above were deemed adequate for adoption, signifying a level of competence or effectiveness in the context of the research criteria. This model

provided a structured approach to evaluating and classifying outcomes, enhancing the research's reliability and objectivity in determining the suitability of various elements under consideration

A set of criteria, based on Parady et al., (2021) work, was adopted to evaluate the model. The respondents were asked to respond to a Likert scale with scores ranging from score 1- where: 1= Strongly Disagree (SD); 2 = Disagree (D); 3= Neutral (N); 4 = Agree (A); 5= Strongly Agree (SA). A mean score of 4 and above in each criterion was considered adequate for adoption of the model. For elements whose mean score rated below 3 were dropped while for those whose score 3 on the 5-point Likert scale, modification was made according to experts' opinion and recommendations The researcher used a mean score of 4 as the point of agreement that was adequate to accept the element as the most common way to rule on consensus (Bascom, etal 2018)

3.12.7 Step 7: Model Testing

The researcher aimed to determine whether the intervention performed as predicted by addressing Research Question 4: "What is the level of skilled delivery services utilization among women of reproductive age following the testing of the care model in the study area?"

The researcher adopted Aromataris et al, (2022) JBI Critical Appraisal Checklist for Quasi-Experimental Studies (Non-Randomized to ensure that the testing of the model followed the scientific manner as illustrated in the table 3.14 below.

Table 3.14: JBI Critical Appraisal Checklist for Quasi-Experimental Studies

	Criterion	Explanation	Action taken
1	Clear Temporal Relationship between what is the cause' and what is the 'effect'	Ensure clarity in identifying the cause' (independent variable/ intervention) and 'effect' (dependent variable/outcome) without confusion about their sequence of occurrence in the study.	The strategies of model of care were implemented to the intervention group for a period of three months from NOV 2022 to February 2023 when the evaluation of the effectiveness of the model was undertaken
2	Similar Participants:	Assess if participants in compared groups are similar, minimizing selection bias in causal relationship studies.	The participants had similar characteristics in terms of ages, pregnancy gestation, co-existing in the same study area with almost common conditions in terms of climate, infrastructure, political and social environment
3	Similar Treatment/Care:	Verify if compared groups received similar treatment/care, except for the intervention of interest, to strengthen causality.	Both groups received the same antenatal care with an additional application of strategies of model of care to the interventional group
4	Presence of Control Group:	Check for the existence of an independent control group to enhance the validity of causal inferences.	The study group in Gaichanjiru ward was allocated the role of comparison group while the study group in Ngararia ward were allocated the role of intervention group
5	Multiple Outcome Measurements:	Compare outcome measurements before and after intervention to analyze changes and alternative explanations.	A baseline study was done early in the year 2022 while evaluation to intervention was done 12 months later to analyze the effectiveness of the model
6	Complete Follow-up:	Ensure follow-up completeness and adequately describe differences between groups to avoid alternative explanations for effects.	Both groups were constantly followed through home visits, phone calls, provision of transport means and what sap group to ensure that they were kept on track
7	Consistent Outcome Measurement:	Verify consistent outcome measurement in compared groups to avoid confusion with the intervention's effect.	The main indicator was the number of skilled deliveries recorded after the intervention
8	Reliable Outcome Measurements:	Check for reliability in outcome measurements to strengthen the validity of causal effects' estimation.	The study used the appropriate formula to calculate the sample size that yielded to sufficient statistical power, appropriate effect size and utilized appropriate statistical procedures to detect meaningful differences between groups if they exist
9	Appropriate Statistical Analysis:	Verify appropriate statistical analysis, power, and assumptions compliance to minimize errors in inferring causal relationships.	The research utilized SPSS Version 27 to calculate z-scores and p-values, checking for significant statistical differences and complying with appropriate statistical analysis, power, and assumptions to minimize errors in inferring causal relationships

3.12.7.1 Summary of the Intervention / Application of the Model of Care

Table 3.15 below illustrates the interventions /applications of the developed model.

Table 3.15: Summary of the Intervention / Application of the Model of Care

Level	Target group	Inputs/ requirement	Outputs/activities	outcome
Personal level	Pregnant women	Staff Volunteers Time Money Materials Research base Venue Transport Equipment Technology Partners Government	Health education and awareness creation - the research team conducted 3 seminars on skilled births in span of 3 months Motivation-those women who delivered in hospital were applauded and recognized in the public for their success Rewards/incentivization on- Through the collaboration with the county government, all women who delivered in the hospital were given two thousand shillings as incentive to encourage the practice Enablement- women were helped to register and join local women groups (CHAMAS) for support Sensitization on government policies women were informed of the reproductive health rights and health care payment polices – NHIF, LINDA MAMA	Awareness and attitude change And Increased number of women utilizing skilled delivery services
interpersonal	Women Family members	Staff Volunteers Time Money Materials	Health education and awareness creation. The target groups were informed on the need to support pregnant	Awareness and attitude change Increased Support of

Level	Target group	Inputs/ requirement	Outputs/activities	outcome
	Health care workers Women group leaders	Research base Venue Transport Equipment Technology Partners Government	women as well as to recognize danger signs of pregnancies and the need for skilled deliveries Family dialogue- the pregnant women and their family members had a talk with research teams on the important of family support to pregnant women Pregnant women seminars 3 seminars were conducted on the skilled delivery Maternity open days- 3 maternity open days were held in Kandara hospital to help women have a feeling of the services offered and the hospital environment Women development groups- the women were encouraged to join women groups for their socio-economic growth and financial stability Enablement- the women were encouraged to starts small scale businesses like keeping chicken, rabbits and green groceries for their financial independence Sensitization on government policies women were informed of the reproductive health rights and health care payment polices – NHIF, Linda Mama	pregnant women Financial independence And Increased number of women utilizing skilled delivery services

Level	Target group	Inputs/ requirement	Outputs/activities	outcome
Community level	CHVS, CHAS, women, and family members.	Staff Volunteers Time Money Materials Research base Venue Transport Equipment Technology Partners Government	Health education and awareness creation Support groups mobilization to support women Enablement of women for financial independence Maternal/ Neonatal audits for deaths and near miss Advocacy on pregnant women and children Maternity open days to know the services provided Transport services – need for community owned transport Follow up – need for follow-up of pregnant women in the community Telephone communication- what Sapp groups and phone calls for reminders Sensitization on government policies women were informed of the reproductive health rights and health care payment polices – NHIF, Linda Mama	Awareness and attitude change Increased Support of pregnant women' Financial independence And Increased number of women utilizing skilled delivery services

3.12.7.2 Process of Model Testing

The process of recruitment, follow-up and evaluation followed the process illustrated in the tables 3.16 (comparison) and 3.17 (intervention) below.

Table 3.16: Follow Up on Comparison Group

Date	Type of the meeting	Participants	Venue	Activity	Indicators	Outcome
19th Oct-2nd Nov 2022	Model validation by the Experts	Experts	Online	Validation of the model	Number of experts reached and submitted their reviews	Validated module
27th OCT 2022	Chief baraza	Chief Assistant chief CHVS CHAS Community members	Kagira shopping center	Sensitization of stake holders on the study and the Standard ANC care	Number of stakeholders reached and sensitized	All the stake holders were sensitized on the study
2nd November 2022	Health worker initial sensitization meeting	Health care workers Gaichanjiru mission hospital, Mariani, Nguruweini, Kariua and Kagumoini dispensaries	Gaichanjiru mission hospital Kumudini	Importance of the standard ANC CARE	Number of health care workers sensitized on the study and the developed model of care	All health workers were sensitized on the study and their role in provision of Star dad care
2nd November 2022	Contact meeting 1	CHVS Health care workers Health care workers ANC mothers Family Members	Respective Health facilities	Recruitment and enrollment of respondents	Number of health workers reached Number of ANC mothers enrolled to study	All health workers were sensitized on study Women enrolled to the study
30th November 2022	Contact Meeting 2	CHVS, Pregnant women Health care workers	Respective Health facilities	Follow up on ANC visits	Number of women continuing with standard ANC visits	Monitoring and evaluation of the programme
28th DEC 2022	Contact meeting 3	CHVS Pregnant women Health care workers Relatives	Respective Health facilities	Review of women in the study	Number of women continuing with the routine ANC visits	monitoring and evaluation of the programme Closure of the study
25th JAN 2023-15th FEB 2023	Contact meeting 4 (exit)	Women Relatives	Clients home	Data collection to determine the place of	Number of women reached	Data on where the respondents delivered

Date	Type of the meeting	Participants	Venue	Activity	Indicators	Outcome
				birth and influencing factors		

The study followed the process of testing of the model on the intervention group as elaborated in table 3.17.

Table 3.17: Follow Up for Intervention Group

Date	Type of the meeting	Participants	venue	Activity	Indicators	Outcome
25TH OCT/2022	Chief baraza	Chief Assistant chief CHVS CHAS Community members Research assistants	Kibuu shopping center	Primary health care Topic- utilization of skilled deliveries in the area Sensitization on the Support groups Mobilization Maternal/ Neonatal audits. Advocacy Transport services Follow up of ANC/PPNC women Role of the community Telephone communicatio n Sensitizations on government policies Linda mama,NHIF	Number of stakeholders reached and sensitized	All the stake holders were sensitized on the model and the process of its testing
9th November 2022	Health worker initial sensitization meeting	Health care workers In respective facilities	Kandara Subcounty hospital	Rolling down of model Laboratory tests- ANC PROFILE Obstetric ultrasound IFAS	Number of health care workers sensitized on the model	sensitization of all health workers on the model and the process of its testing
9th November 2022	Contact meeting 1	Naaro and Ngararia dispensaries CHV's	Health care workers CHV's ANC mothers Family Members	Introduction to study objectives IBP History physical exam ANC profile OBS U/S	Number of health workers reached Number of ANC mothers	All health workers were sensitized on the model and the process of its testing

Date	Type of the meeting	Participants	venue	Activity	Indicators	Outcome
					enrolled to study	Clients were enrolled to the study
7th DEC 2022	Contact Meeting 2	Naaro dispensary and Ngararia dispensary	Health care workers ANC mothers	Follow up on IBP ANC profile Obs/u/s	Number of women with IBP Number of women with ANC profile Number of women with Obs u/s	monitoring and evaluation of the programme
4th JAN 2023	Contact meeting 3	Naaro dispensary and Ngararia dispensary	Health care workers ANC mothers Relatives	Review on IBP Assessment on birth preparedness	Number of women with IBP	monitoring and evaluation of the programme Closure of the study
1st Feb 2023-23RD FEB 2023	Contact meeting 4 (exit)	Clients home	Women Relatives	Data collection to determine the place of birth and the factors that influenced	Number of women reached	Data on where the respondents delivered

3.12.7.3 Steps of Testing the Developed Model of Care

The study adopted the 5 Steps approach of pipeline model theory of change (an example of design for behavior changes framework) to implement and test the strategies of the developed model The Scottish Government (2019). The steps are as indicated in table 3.18 below.

Table 3.18: The 5 Step Approach to Evaluation: Designing and Evaluating Behavior Change Interventions

Step	Action	Approach to evaluation	Output
1	Identify the problem	The ultimate aim of an interventional model is to change people's behavior, the researcher needs to be clear what it is the researcher trying to change and why there is currently a need for this to happen.	The researcher used the problems/gaps identified in the baseline research findings
2	Review the evidence	What the researcher intends to do should be grounded in the evidence of 'what works' and why? In order to achieve the intended behavior change.	The researcher used the literature review and strategies that were applicable in solving the problems identified in the baseline research findings
3	Draw a logic model	Develop a logic model to outline activities and aims	The study utilized the Validated model of care with implementation strategies
4	Identify Indicators and monitor the model	Use the logic model to identify indicators (measurements or observations)	The research was guided by the components of developed logic model that included: inputs, activities, users, short, medium and long-term outcomes.
5	Evaluate effectiveness of the model	Analyze the data on the indictors to evaluate effectiveness of the model do a report and use the research findings to improve on the service	Calculation of skilled delivery proportion and statistical analysis for hypothesis testing and conclusion of the results on the effectiveness of the developed model of care

Application of the 5 Step Approach to Evaluation: Designing and Evaluating Behavior Change Interventions

- Priority “evaluation questions”

The research question is: What is the observed level of utilization of skilled deliveries after implementing and testing of the developed model of care.

Identify specific indicators (measures3.12.7.2 Step 1 Identify the problem

The research findings revealed that Skilled birth attendance is one of the highly effective impact interventions to reduce maternal, newborn and child mortality and morbidity (Adegoke et al, 2023) However, Skilled deliveries in Kenya still remains

low at 62% (KDHS, 2014). In Kandara Sub-County, skilled deliveries stands at 65% while home deliveries are at 35% - below the national and global targets of 100% (KNBS, 2015). In addition, there is no existing model of care in the study area to handle this menace. The period of labor and delivery is critical with unforeseen complications and therefore requires assistance from a competent Skilled Birth Attendant (SBA) UNICEF, 2021).

3.12.7.4 Step II Review the Evidence

The researcher carried out a thorough literature review on the study topic and also carried out a baseline study from January to March 2022 and the research findings are as indicated in chapter 4. The researcher used the strategies from the baseline data analysis as evidence to develop the model of care.

3.12.7.5 Step III Draw a Logic Model

The logic model shows how the project should work by showing the links between resources, activities and outcomes. They are step-by-step diagrams which simply show what the researcher is hoping to achieve (outcomes), and what resources (inputs) that are need to achieve the outcomes (Gugerty &Karlan 2018). The researcher used the model of care which was developed based on a logic linear model**.**

3.12.7.6 Step IV Monitor the Logic Model - Use the Logic Model to Agree Evaluation Questions and Indicators

Indicators provide evidence whether the model is working as expected or not. In this research the indicator is the number/percentage of women who utilized the skilled delivery services after testing of the model of care. For academic purpose and also considering the feasibility of this study in terms of time frame, funding, Government policies and stakeholder's needs, the researcher tested the model of care on a small number of clients to assess its effectiveness. The calculations of proportionate and percentage of skilled deliveries was carried out and tabulated as indicated in chapter 4.

3.12.7.4 Step V Evaluate the Model- Analyzing Data to Evaluate the Project

Analyzed data of phase two aided the researcher to evaluate the model of care. Calculation of skilled delivery proportion and statistical analysis for hypothesis testing and conclusion of the results on the effectiveness of the developed model of care

3.12.8 Step 8: Presentation of the Developed Model for Adoption and Implementation

This is the last step of model development where verified and final document of the model was submitted to stakeholders and relevant government's bodies for endorsement, adoption, and implementation.

3.13 Hypotheses Testing

Hypothesis testing for a proportion is used to determine if a sampled proportion is significantly different from a specified population proportion. The study used Z score to test the difference. The z- score test for two population proportions is used when the researcher wants to know whether two populations or groups differ significantly on some single (categorical) characteristic (in this study," the utilization of skilled deliveries"). The study used the following steps adopted from a step-by-step guide of hypothesis testing by Bevans, (2022).

Steps of hypothesis testing.

3.13.1 Formulate the Research Question

The formulated question was: "Is there an observable difference in level of utilization of skilled deliveries between the intervention and comparison group?".

3.13.2 Check for Randomization, Independence and Mutual Exclusiveness of the Two Proportion Z-Test.

This was ensured that statistical method results are accurate,

Random Sample**:** The data points for each group in study analysis must have come from a simple random sample to avoid bias, hence a probability to have incorrect results. The research used Simple random sampling to get the sample size of 154 subjects (77 in comparison group and in the intervention group)

Independence: Each of the observations (data points) should be independent. This means that each value of the variables doesn't depend on any of the others.

Mutually Exclusive Groups

The two groups assigned to either comparison or interventional groups as tabulated in table 3.19

Table 3.19: Proportionate of the Total Sample Number

Group	Area	Total sample Number
Intervention group	Ngararia ward	77
Comparison group	Gaichanjiru ward	77
Total		**154**

3.13.3 State the Null Hypothesis and the Alternative Hypothesis

The null hypothesis (H_0) always contains equality, and is the one the study tries to refute. The alternative (research) hypothesis never contains equality, and is the one the study tries to confirm.

The two hypotheses should be stated so that they are mutually exclusive (if one is true, the other should be false, and vice versa) and collectively exhaustive (at least one of the outcomes must occur). In this study, hypotheses were formulated as 2-tailed:

3.13.4 Set an Appropriate Significance Level (Alpha)

By definition, the alpha level is the probability of rejecting the null hypothesis when the null hypothesis is true. Most commonly, alpha is set at 0.05 (denoted as α or alpha) indicating a 5% risk of concluding that a difference exists when there is no actual difference. If the p-value is less than or equal to the significance level of 0.05, then the decision to reject the null hypothesis and confirmation of alternative hypothesis is be

made. If, however, the p-value is greater than the significance level of 0.05, then the decision not to reject the null hypothesis and not to confirm the alternative hypothesis is be made. This study adopted the alpha of (0.05) as its significance level.

3.13.5 Calculate the Test Statistic, Z-Score

The z-score, also referred to as standard score and z-value is a signed real valued dimensionless quantity which indicates the number of standard deviations by which a given observed data point is distanced from the mean or expected value of a distribution. Standard refers to the fact that they are computed against the standard normal distribution (Z distribution) which is fully defined by its mean and standard deviation of zero and one, respectively (Stangroom, 2022). Z values are also used in process control and quality assurance applications and also are useful in comparing measurements across different scales in both scientific and applied disciplines (Stangroom, 2022). This study research used SPSS version 27 software to calculate the value of z-score.

3.13.6 Convert the Test Statistic Z-Score to a P- Value

The p value is the probability that a randomly selected sample of n would have a sample statistic at least as different as the one obtained. The level of p value enabled the researcher to decide whether to reject or fail to reject the null hypothesis by comparing it with the set alpha

3.13.7 Decide between Null Hypothesis and Alternative Hypothesis

The decision to decide between the null and alternative hypotheses was guided by the values of p and the set alpha.

3.13.8 State a Conclusion about the Research Question

The researcher stated the basis of rejecting or failure to reject the null hypothesis based on the level of p value.

3.14 Ethical Considerations

The study obtained ethical clearance from the JKUAT Ethics Review Committee (Approval number JKU/IERC/02316/0431, Appendix X) in November 2021 and a permit from NACOSTI (Approval number 303892, dated 6th Jan 2023, Appendix IX). Approval from the County government of Murang'a was granted through a letter (REF NO: MOH/GEN/MUR/VOL.V/58, Appendix XI) on December 14, 2021. Informed consent was obtained from all participants.

3.15 Study Assumptions

It was assumed that all respondents gave sincere information that reflected the true status in relation to their utilization of skilled birth services.

3.16 Study Limitations and Delimitation

3.16.1 Limitations

- Loss of the follow-up as the study process had two phases
- Passive resistance from some of the respondents
- Financial constraints
- **Social desirability bias:** Participants may have been inclined to provide answers that they believed were socially desirable or favorable to the researchers. This may have influenced their responses and made it difficult to obtain accurate information on their experiences.
- **Recall bias:** Participants may have difficulty recalling specific details of their experiences during childbirth, particularly if they occurred several months or years ago. This could lead to inaccurate or incomplete information being provided to the researchers
- Risk of contamination of information in phase 2

3.16.2 Delimitations

- Proper explanation on the purpose and approach of the study was done.
- Close follow-up of study groups was done to ensure consistent contact.

- The geographical distance between the two wards was considered to ensure no contamination of respondents during intervention.

CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter explains how the data obtained from the two study phases was analyzed and presented. All the Six wards in the sub-county were included in this study. Phase I of the study involved collecting both quantitative and qualitative data by use of questionnaires FGDS and KII respectively. Key themes that emerged from the data analysis of Phase I of the study were utilized in development of a model of care to enhance utilization of skilled delivery services.

In phase2, Non-equivalent Quasi experimental research design was used to test the developed model of care. Table 4.1 Illustrates how study objectives were addressed in each phase of the study.

Table 4.1: Specific Objectives per Study Phase

S/NO	Study objective	phase
1	To establish client's experiences on skilled delivery services among women of reproductive age in Kandara Sub-County.	I
2	To establish strategies to increase the utilization of skilled deliveries among women of reproductive age in Kandara Sub-County.	I
3	To formulate a model of care to increase the utilization of skilled delivery services among women of reproductive age in Kandara Sub-County.	1
4	To evaluate the level of utilization of skilled deliveries among women of reproductive age in Kandara Sub-County after testing of the developed model of care	2

4.1.1 Reliability Test

After Pretesting of tools, reliability test was conducted for all the subscales in the respondents' questionnaire using Cronbach's alpha. In this case, an alpha of 0.7 or above was deemed as acceptable. The test was carried out to determine whether the responses provided by the respondents adequately addressed each item on the subscales in relation to women's attitudes and knowledge towards health facilities delivery and choice of place of delivery for mothers seeking child welfare services as indicated in Table 4.2 below.

Table 4.2: Reliability Testing

Sub scales	Number of cases	Cronbach's Alpha
Lack of information about skilled delivery services offered in hospitals has encouraged home delivery	44	.78
I am aware that effective postnatal care helps reduce maternal and neonatal deaths	44	.75
Knowledge on utilization of health facilities for labor and delivery services helps reduce maternal and neonatal deaths	44	.75
I am aware of antenatal, delivery, post-partum and family planning services offered in hospitals and this makes me deliver in hospitals	44	.76
Mothers are educated on the complications associated with pregnancy and child birth when they attend antenatal clinics	44	.77
It is safer to deliver in a hospital than at home	44	.76
Poor delivery environment lack of privacy discourages women from delivering in health facilities	44	.74
Lack of satisfaction with service delivery encourages women to deliver at home	44	.74
Harsh settings in hospitals encourages delivery at home	44	.76
Lack of respect for cultural beliefs encourages delivery at home	44	.77

4.1.2 Response Rate: Baseline Survey

The questionnaires issued out to the targeted respondents were 347. After data collection and cleaning of the data, 344 questionnaires were valid constituting to 99% of the total questionnaires. The response rate is considered satisfactory to make conclusions for the study. This collates with Sataloff et al (2021). Assertion that a response rate of 50% is adequate, while a response rate greater than 77% is very good. This therefore, implies that based on this assertion, the response rate in this case of 99% is very good. The respondents were drawn from all the 6 wards Gaichanjiru Ithiru Ngararia, and Kagunduini wards had 100% response rate while Muruka and Ruchu had 98% and 97% response rates respectively as shown in Table 4.3 below.

Table 4.3: Response Rate

S/NO	Ward	Proportionate sample size	Response	% response rate
1	Ruchu	83	81	97%
2	Muruka	52	51	98%
3	Kagunduini	64	64	100%
4	Gaichanjiru	49	49	100%
5	Ithiru	56	56	100%
6	Ngararia	43	43	100%
7	Total	347	344	99%

4.2 Socio-Demographic Characteristics

4.2.1 Respondent's Age in Years (n= 344)

The respondent's ages ranged from 16 years being the youngest to 45 years as the oldest. Majority of the respondents were aged 25 years. The mean age was 28.56 while the mode was 25 years as illustrated by figure 4.1 below

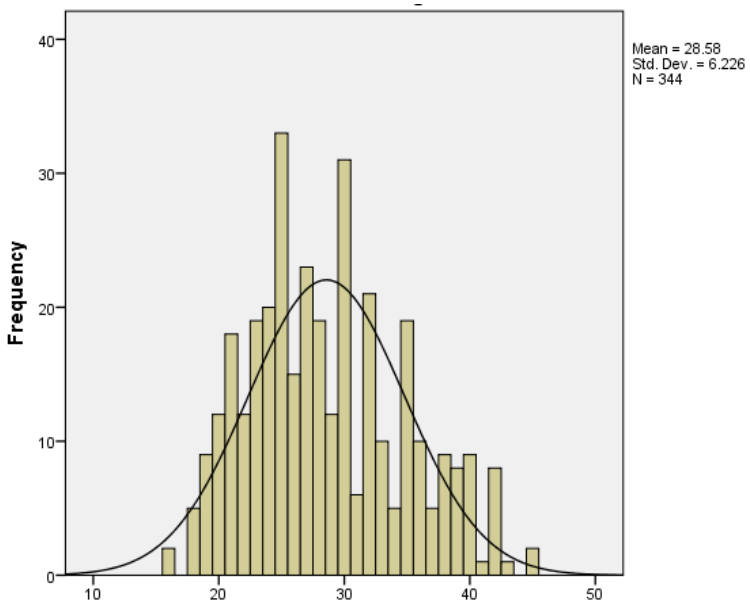

Figure 4.1: Histogram Showing Respondents Age in Years

4.2.2 Age of Respondent's Last Child

The age of the respondent's last child at the time of filling the questionnaires ranged from less than a month old being the youngest to 12 months being the oldest. The mean age was 6 months while the most common age was 8 months. Figure 4.2 shows the summary of the respondent's child age.

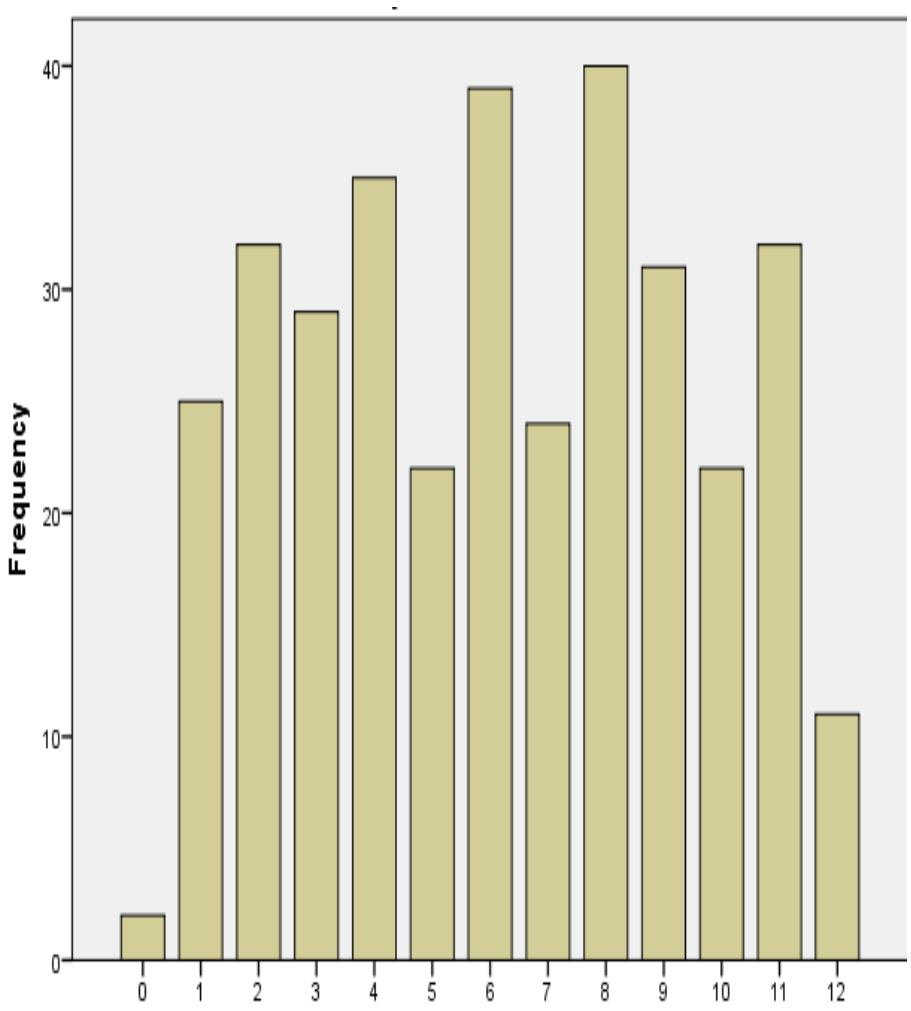

Figure 4.2: Age of the Current Respondent's Child by Months

4.2.3 Respondents Residence in the Last One Year (Twelve Months)

All of the respondents had lived in Kandara Sub-County in the last twelve months preceding the study period. Figure 4.3 indicates the actual village in the Sub-County where the respondents lived.

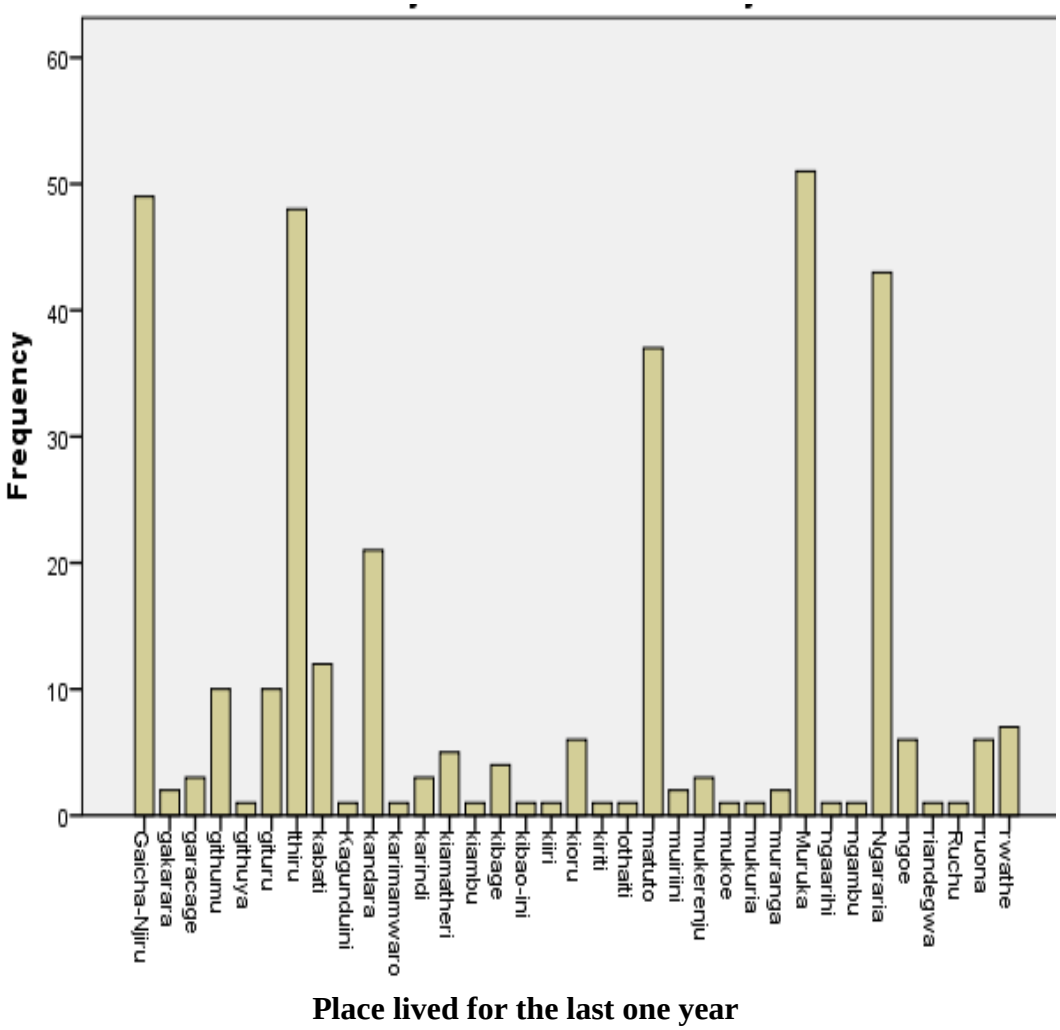

Figure 4.3: Bar Graph of Place of Residence per Village

4.2.4 Parity of Women Who Gave Birth within One Year (n=344)

The study found that respondents had given birth to between one and eight children in their lifetime. On average, respondents had at least two children, with the majority having three children. Figure 4.4 provides a visual representation of the number of children born by the respondents.

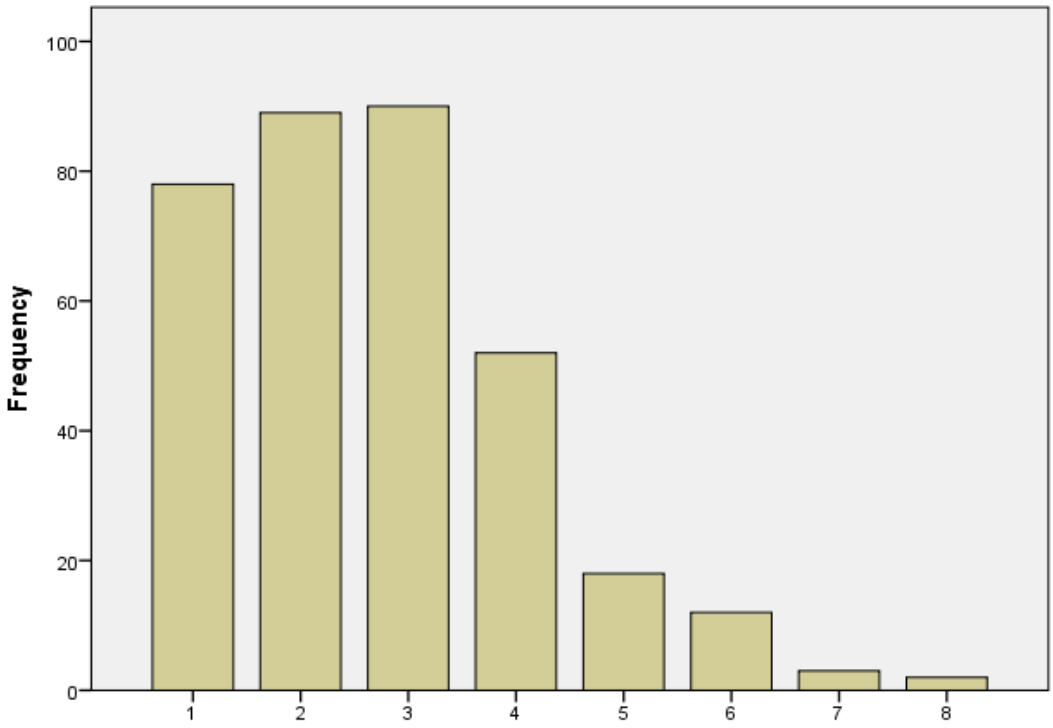

Figure 4.4: Bar Graph Showing the Respondent's Number of Children ever Borne

4.2.5 Respondent's Level of Education

Concerning the respondents' educational attainment, the data was categorized into five groups: No formal education, primary, secondary, college, and university. The majority of respondents had completed secondary education, accounting for 47.1%. Only 2 respondents (0.6%) had achieved a university level of education, as illustrated in Table 4.4 below.

Table 4.4: Level of Education

Level of education	Frequency	Percent
College	33	9.6
No formal education	4	1.2
Primary	143	41.6
Secondary	162	47.1
University	2	.6
Total	**344**	**100.0**

4.2.6 Marital Status (n =344)

The majority of the respondents, comprising 78.1% of the total, were married. Conversely only 7 respondents were widowed, representing the smallest cluster at 2% of the total. Table 4.5 presents a frequency summary of this data.

Table 4.5: Marital Status

Marital status	Frequency	Percent
Married	247	71.8
separated/divorced	14	4.1
Single	76	22.1
Widowed	7	2.0
Total	344	100.0

4.2.7 Religious Affiliation

Respondents were asked to indicate their religious affiliation as either Christian, Muslim, or other. The vast majority of respondents, accounting for 99.7% of the total, identified as Christian. Only 0.3% of respondents (1individual) reported being Muslim. Table 4.6 provides a frequency summary of respondents' religious affiliations.

Table 4.6: Religion

Religion	Frequency	Percent
Christian	343	99.7
Muslim	1	.3
Total	**344**	**100.0**

4.3 Objective 1- Experiences of the Respondents on Skilled Delivery Services

The respondents were to respond on various experiences during labor and delivery under the care of a skilled birth attendant under the following aspects: place of delivery, birth attendant, reasons for home delivery, treatment by the health care workers, conduct/attitude of the healthcare workers and the respondents' attitudes towards the health facility delivery services,

4.3.1 Place of Delivery per Ward

In terms of place of delivery per ward, the data analysis indicated that a majority of respondents, **243 (70.6%)**, had skilled deliveries during their last delivery, while **101 (29.4%)** delivered at home or en-route to a health facility without assistance from a skilled health worker. Ngararia and Gaicha-njiru wards had the highest number of home deliveries, whereas Kagunduini and Ruchu had the highest number of skilled deliveries, as demonstrated in Table 4.7.

Table 4.7: Place of Delivery of the Last Child per Ward

Ward	**Place of delivery of the last child?**			
	Home / on the way (unskilled)	**Hospital(skilled)**	**Total**	**Total %**
	Count	**Count**	**Count**	
Gaicha-Njiru	22 (45%)	27 (55%)	49	100
Ithiru	14 (25%)	42 (75%)	56	100
Kagunduini	10 (16%)	54(84 %)	64	100
Muruka	22 (43%)	29(57%)	51	100
Ngararia	25 (58%)	18(42%)	43	100
Ruchu	8 (10%)	73 (90%)	81	100
Total	**101 (29.4%)**	**243 (70.6%)**	**344**	**100**

4.3.2 Birth Attendant during Home Delivery

The findings revealed that majority of the respondents who delivered at home, 99.1% of them were assisted by a relative while 3(0.9%) were assisted by traditional birth Attendant. Table 4.8 below shows the summary of home delivery assistant.

Table 4.8: Birth Attendant During Home Delivery

Birth attendant	Percent	Valid Percent
Relative	98	99.1
Traditional Birth Assistant	3	09
Total	**101**	**100.0**

These findings were supported by results of qualitative data analysis that revealed that most of mothers who delivered at home were assisted by the relatives during delivery as it was cited by one respondent's statement:

"*I only visit the clinic for ANC check-up to ensure that my baby and I have no problem but when my time to give birth comes, I call a relative at home to assist me. The staff in the hospital is very rude. (WFGD, 2-1)*

4.3.3 Reasons for Home Delivery

The respondents were asked to state the reasons that made them not to deliver at the hospital either by choice or circumstance. Majority 69 (68.3%) of the respondents stated that they delivered at home or on their way due to circumstances while 33 (31.7%) cited choice as the reason for home delivery as indicated on Table 4.9.

Table 4.9: Reasons for Home Delivery

Reason	Frequency	Percent
Choice	32	31.7
Circumstances	69	68.3
Total	**101**	**100**

4.3.3.1 Circumstances that Led to Home Delivery

The respondents were requested to state the circumstances that led them to deliver at home. Majority of the respondents 20 (29%) cited ignorance of their Expected date of delivery as the main cause of home delivery. Short labor also among the most causes of unskilled deliveries cited by 19 (27.5%) of the respondents. Table 4.10 shows the frequency and percentages of the circumstances

Table 4.10: Circumstances that Caused Home Delivery

Circumstance	Frequency	Percent
Delay in transport	12	17.4
Didn't know the delivery date	20	29
Facility was too congested	2	3
Hadn't gone for clinic	1	1.4
Lack of money for transport	6	8.7
Poor road and it was raining	6	8.7
Quick labor	19	27.5
Was told to return back home and dilate more	3	4.3
Total	**69**	**100**

Results of qualitative data analysis found that quick labor, Lack of individual birth plan and lack of personal preparedness, past experience of safe deliveries, Lack of knowledge on the importance of skilled birth attendance services and Delays to seek medical helps were some of the circumstances that led to unskilled deliveries among the respondents

1) Quick labor (Precipitate Labor)

Unexpected quick labor was the main reason cited by the respondents for not utilizing skilled birth attendance services. One of the participants mentioned the following statements:

"I delivered on the way while I was trying to go to the health Centre. I would have given birth in the HC but labor was so fast and delivered immediately after I left home for the health center", (WFGD, 5-5)

Another one said:

"I was gardening, all over sudden I felt a sharp pain on my lower abdomen. I didn't have time to call for ambulance actually I delivered immediately I entered my house. *(*WFGD, 6-6)

2) Lack of individual birth plan and preparedness

The participant indicated that the reason they were not giving birth in health

Facilities were that they were not yet prepared with the necessary materials needed for delivery and also money for transport. The following quote from the FGD participants affirmed this:

"I gave birth at home because my labor started at night; I was not anticipating giving birth as I was not sure of my date. I had not bought baby layette and had no transport money I was still looking for it but labor occurred and nothing else I could do." (WFGD, 3-1)

3) Lack of knowledge on the importance of skilled birth attendance services

Lack of knowledge or awareness on the importance of skilled birth attendance services was also identified as a reason for not utilizing skilled birth attendance services. The following statements supported this:

"*Some women deliver at home due to lack of knowledge as they do not know the risks associated with home delivery. They give birth at home because they are not educated and they do not have the knowledge otherwise it is good to give birth in health Facility."* (KII, 7)

4) Delays to seek medical helps

The study findings also revealed that delays to take laboring women to health facilities were one of the reasons for not utilizing skilled birth attendance services. One of the FGD participants said:

"*The reason most women do not give birth in hospitals is they do not take seek health services immediately, but they take time until a complication occurs. They do not go to health facility as soon as the labor starts hoping to deliver normally at home." (KII, 11)*

4.3.3.2 Reasons for Choosing to Deliver at Home

1) Past experience of safe deliveries

The findings of this study showed that previous places of childbirth influenced the utilization of skilled birth attendance services in the subsequent pregnancies. Women who had no prior experience of giving birth in health facilities and those who had given birth at home did not use skilled birth attendance services. The following statements described the participant women's responses:

"I delivered all my babies at home with no complication so I don't see the need to go to hospital it is a waste of time and money. (WFGD, 2-4)

2) Religious factors

The study findings from qualitative revealed that there are some religious factors hinder the utilization of skilled delivery services as evidenced by a statement of one of the respondents

"I belong to a church called Mugendi, and in our church we believe in God only not doctors and nurses, when one of us is in labor we go on our knees and pray to our living God to give her a normal delivery and I can attest he does.so to me I cannot deliver in the hospital" (WFGD, 3-5).

4.3.4 Treatment by Health Care Providers

The respondents who delivered in hospital gave their responses on how they were treated by the health care providers. Majority 137 (56.3%) gave an overall negative response of having been treated badly by the health workers while 106 (43.7%) gave a positive response that they were treated nicely. Table 4.12 gives a summary of these responses.

Table 4.12: Treatment by Health Care Workers

Treatment	Frequency	Percent
Very badly	36	14.8
Badly	28	11.5
Nicely	73	30.0
Very nice	106	43.7
Total	**243**	**100**

Findings from qualitative data revealed that harsh treatment by health workers were some of the factors that hindered hospital delivery as was cited by one respondent statement:

"I went through hell that day, I was admitted and when the time for the baby came, I was told to lie on a bed and open my legs. I didn't get the instructions well and when I asked the nurse what she meant she slapped me twice and asked me my level of education if I cannot follow simple instructions. I remember that day to date and I would not like any other woman to pass through what I went." (WFGD 5-1)

Qualitative Study findings revealed that good interpersonal relationship between the health care provider and the clients motivated the women to utilize skilled birth attendance services in their future pregnancies. The respondents claimed that a friendly service and close follow-up from health workers encouraged them to utilize skilled birth attendance services. The following verbatim quote corroborated this:

"I would like to utilize skilled birth attendance service because the nurses and doctors are very friendly. They talk nicely explaining every detail of the procedures. They clean our babies and change their diapers; they provide us with clean bed sheets and blankets. One feels as if she is still at the comfort of her home. Besides they also provide us with pain killers hence no after birth pain." (WFGD, 1-6)

4.3.5 Conduct/Attitudes of Health Care Workers

A further question on how exactly the health care providers conducted themselves during the last delivery was asked. Majority 179 (73.4%) of respondents gave a

positive response regarding the conduct of the health care workers while the rest 64(26.5%) reported otherwise as shown in Table 4.13.

Table 4.13: Conduct of the Health Workers during the Respondent's Last Delivery

Staff conduct	Frequency	Percent
Negative, unfriendly, unwelcoming, rude	2	0.8
Negative, unfriendly, unwelcoming,	4	1.7
unkind	6	2.5
Rude, unkind	9	3.7
Negative, unfriendly, unwelcoming	14	5.8
Rude	29	12.0
Unkind	179	73.5.
positive, friendly and welcoming		
Total	**243**	**100**

Qualitative data revealed that negative attitude towards health workers, misconception on health system procedures and harsh treatment by health workers were some of the factors that emanated in this theme; the following statements were recorded.

Respondent one

"*I can't withstand the harassment and rudeness of the nurses at the hospital as I give birth. In fact, giving birth is a natural process and the presence of health care workers does not benefit us in any way as the baby will be born with or without them assisting. (WFGD, 5-2)*

Another respondent said;

"I fear giving birth at the hospital the midwives there don't explain to you what they want to do with your body. You find them preparing instruments, put on funny clothes and then tell you to lie on the couch they want to do a procedure on you. I even don't understand them" (WFGD, 1-2)

4.3.6 Attitudes towards Health Facility Delivery Services

The respondents were asked on attitudes towards various aspects of health facilities delivery and choice of place of delivery. The aspects were environment, privacy, and level of satisfaction of services rendered, hospital settings and respect for cultural beliefs. Responses ranged from 1 to 5, where: 1= Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA). Table 4.14 gives a cross-tabulation summary of the responses.

Table 4.14: Attitudes Towards Hospital Delivery versus Home Delivery

Item	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Delivery environment and privacy influence women to deliver in health facilities	80(23%)	75(22%)	40(12%)	85(025%	64(19%)
Level of satisfaction with service delivery encourages women to deliver at home	68(20%)	36(10%)	56(16%)	90(26%)	94(27%)
Harsh hospital settings encourage delivery at home	73(21%)	56(16%)	26(8%)	85(25%)	104(30%)
Lack of respect for cultural beliefs encourages delivery at home	81(*24%)*	71(*21%)*	61(*18%)*	51(*15%)*	80(*23%)*

Qualitative data findings revealed that health facility related reasons play a key role in choice of place of delivery. The following categories emanated from the analysis of qualitative data: Lack of essential medical resources, Lack of 24hour services in the facilities, Lack of food provision in health facilities, Lack of birth partner during labor and delivery and Misconceptions and myths about health facility delivery**.**

1) **Lack of essential medical resources,**

Women perceived that they had received poor services in the health facilities as sometimes there are no essential medical supplies in the facility and this in turn caused dissatisfaction with the service received. The following statements were mentioned by some of the women:

"One of the midwives told me that I got a tear during delivery and that I needed to be stitched but there were no materials to stitch me unless I buy. I had to wait till the next day when my husband came to visit me, he went back and bought the materials only for me to be treated 48hours later, and I never went back to that facility." (WFGD, 5-3)

Another one said:

"Before I was admitted in the health center the staff gave me a list of things I needed to by prior to admission, they explained to me that the resources went out of stock two months ago and therefore women have to buy including gloves, cotton wool and other personal materials. Am telling you it is that bad nowadays." (WFGD, 4-3)

2) Lack of 24-hour services in the facilities

The research findings revealed that the facilities offer services in limited times and lateness and absenteeism of health staff as evidenced by the respondent's quote:

"Sometimes women go to the facility in labor only to find the facility closed. The staff there comes late and leaves early so it is by luck to find any of them in the facility at times of need." (CFGD 6-2)

3) Lack of food provision in health facilities.

The study findings revealed that lack of provision of meals in the health facilities deter women from seeking health care, some of the despondences are:

"I delivered my baby at 9 PM at night in the hospital the staff told me that the meals were served at 6pm and the kitchen staff left for home. I had not eaten anything throughout the day due to labor pains I spent the whole night without having any food until the following morning when my relatives brought me tea and snacks, I really suffered." (WFGD 6-2)

4) Lack of birth partner

This study found that disallowing companions to enter the labor and delivery rooms, and lack of individualized care for women discourages them from utilizing skilled birth attendance services. One of the respondents claimed:

"In the health Centre women are not allowed to get in with their birth companion. At the same time the health care workers are overwhelmed with many women in labor and some get little attention. In this regard the woman feels lonely and abandoned in

new environment. This makes many of us not to visit the facilities but to deliver at home in the company of our beloved ones". (KII, 13)

5) **Misconceptions and myths about health facility delivery**

Myths and misconceptions about health facility delivery deterred women from utilizing skilled birth attendance services. Some of the rumors and misconceptions with regard to health facility delivery were that the women indicated that giving birth in health facilities caused injury to the birth canal and uterus. Besides, the participant women had misconceptions about the physical examination done during labor and delivery. The participant women gave the following statements:

"*I feared going to deliver at the hospital because I was told by a relative that nurses and doctors tell one to undress and then insert their hands in the vagina to pull the baby out. That sometimes they tie the baby's neck with a rope and pull if one is not able to push and that's why most of babies die there" (WFGD, 1-5)*

Another respondent said

"A friend said that the midwives have very sharp scissors that they cut the vagina making it look like a sack that's why we find those women being discharged walk slowly due to pain they experience in their reproductive organs after the procedure." (WFGD, 1-3)

A couple of sociocultural and religious factors stemmed from this study as reasons for not utilizing skilled birth attendance services.

One of the respondents claimed that in ancient age when there was no western medicine women used to deliver at home with no complications.

She said:

"It is our tradition. During the old days there were no hospitals and women used to give birth at home. What is this now the colonialist brought to us that we must give birth in Health facilities? This is against our culture and traditions" (WFGD, 4-5)

Another respondent said:

"In these facilities the pregnant mothers find staffs, who do not understand the language, others are too young that even do not understand our traditions. I cannot go there to deliver; I better deliver at home surrounded by people who understand me and my culture". (WFGD, 1-4)

Category 4: Religious factors

The study findings revealed that there are some religious factors that hinder the utilization of skilled delivery services as evidenced by a statement of one of the respondents

"I belong to a church called Mugendi. In our church we believe in God only not doctors and nurses, when one of us is in labor we go on our knees and pray to our living God to give her a normal delivery and I can attest he does.so to me I cannot deliver in the hospital" (WFGD, 2-6)

4.4.3 Summary of Qualitative Data Analysis (FGD and KII)

A total of 48 CHVs and 48 women who gave birth within one year participated in the FGDs. Besides, individual in-depth interviews were conducted with 10 community health extension workers and 7 administrators of selected health facilities. Consequently, a total number of 4 major themes and several categories/labels for objective 1 on respondent's experiences on skilled delivery services emanated from the analysis of the qualitative data as indicated in the Table 4.15.

Table 4.15: Themes and Categories/Labels

S/NO	Theme	Labels/ categories
1	Factors that hinder utilization of SBA services	Health facility related reasons Lack of essential medical resources No 24hour services No food provided Lack of birth companion 2 Reasons related to health worker Negative attitudes 3.sociocultural factors 4. Religious factors 5.Individual factors Short labor Myths and misconceptions Lack of individual birth plan Past experiences Lack of knowledge Delay to seek healthcare
2	Factors influencing/motivating women to utilize skilled deliveries	Availability of health services- Availability of transport Availability of referral services to the next level of care Availability of life saving interventions during an emergency service Fear of occurrence and experience of danger signs and complications past experiences Presence of a danger sign or complication during ANC Services received Information during ANC visits ANC follow up by health workers Ensuring of good health of the woman and the newborn Early detection and management of unforeseen obstetrical complications Good interpersonal relationship between the health care workers and the clients
3	Benefits of Skilled birth attendance services	Information and advice on maternal and newborn health Good newborn care practice Ensure good health of woman and newborn Disease prevention and treatment services Prevention and management of obstetric and neonatal emergencies
4	Role of the Community in support for women to utilize SBA services	Advice and follow up by CHVs Transport support Assist with household activities Community advice and encouragement

4.4.3.1 Theme 2: Factors that Influenced the Utilization of SBA Services

This theme dealt with the factors that influenced women to utilize skilled birth attendance services in previous deliveries. The following categories emerged.

Category 1: Availability of Quality Health Care Services

The availability of basic and essential services such as ambulance services, referral services and life-saving interventions in case of an emergency influenced women to utilize skilled birth attendance services in the study area as discussed below.

i. **Availability of Transport Services**

The availability of transport to women in labor from their homes to health facilities influenced them to utilize skilled birth attendance services in their preceding deliveries. One of the participant women mentioned the following statements:

"The first thing that comes in mind of a woman at onset of labor is how she will reach the nearest health facility. It doesn't matter the mode of transport, in my community, there are many neighbors with private cars that help the women in time of need and this has really influenced the women to deliver at the health facilities". (CFGD, 1-3)

ii. **Referral Services to the Next Level of Care**

The study findings found out that availability of referral services in health facilities influenced women to utilize skilled birth attendance services in their previous deliveries. The participant women reported that they gave birth in health facilities owing to the fact that they could develop a health problem and/or complication that may require referral to the next level of care. The following verbatim quotes evidenced this:

"In case a woman develops a complication that require specialized care, there is always a standby ambulance to refer the woman to Thika, Maragua or Murang'a I remember during my last delivery I developed bleeding the nurse told me that I require to go to Murang'a, I was put in an ambulance and referred there free of charge, I think this is very commendable". (WFGD, 4-2)

iii. **Life-Saving Interventions during an Emergency**

The study findings revealed that the availability of essential life-saving interventions

in health facilities influenced them to utilize skilled birth attendance services in their previous deliveries. The following statements corroborated this:

"*...I developed excessive bleeding after delivery the midwife inserted some needles in my veins and put up some fluids to run, I was also given an injection on my thigh, I also saw her rubbing my abdomen and later inserted a tube into my urinally bladder and after a while the bleeding stopped. I believe that I would have been dead by now if I had delivered at home since the relatives there couldn't have intervened. That is why I always deliver my babies in the health facility"* (WFGD, 6-1)

Category 2: Fear of occurrence of an obstetric emergency or complication during labor

The research findings revealed following information

i. Past Experiences of an Obstetric Complications

Past experience of obstetric complications in previous childbirths influenced women to utilize skilled birth attendance services in their future deliveries. Verbatim quotes affirmed this:

"I delivered my first child at home since my mother-in-law insisted that it was well but after the baby came out the placenta did not come out. I waited for 5hours bleeding profusely until there was no hope that's when they decided to take me to the nearest health facility where the placenta was manually removed. I was transfused two bags of blood since I had bled much it took me 4 days in the facility before I was discharged home, since then I decided never to deliver again at home even when all seems normal". (WFGD, 1-1)

Another respondent said

"I lost my friend during child labor after developing breathing problems soon after giving birth since then I decided never to deliver at home since a complication can occur any time during the process" (WFGD, 2-3).

Another respondent said

"We are counseled during ANC visits about the danger signs and possible complication during child birth. For me I started noticing a headache that could not be relieved by paracetamol tablet, I started seeing stars and swelling of legs and face I visited the facility and I was immediately admitted and labor induced and delivered, since that day I decided to always deliver at health facility" (WFGD, 5-6).

ii. Presence of an Underlying Danger Sign and/or Complication During Pregnancy

The study findings revealed that presence of an underlying danger sign during pregnancy influenced women to deliver at the health facility. The following quoted information was highlighted:

"I know I am a hypertensive and taking drugs. The health care worker during ANC visit told me that this poses a lot of problems both for me and my unborn child and thus I should give birth in the hospital, in fact, she linked me to the hospital immediately I followed her instructions and as we sit down here see my lovely bouncing boy' (WFGD, 4-6).

Another respondent commented

"I developed a prolonged labor as l remained in labor for two days at home hoping to deliver well however, I could not give a birth despite the long wait.my husband then took me to the HC where I was given some fluids and drugs, fortunately I gave birth to a healthy baby and was discharged the following day. I will never try to deliver at home again I almost lost my baby thanks to the midwives." (WFGD, 3-6).

Category 3: Services received

The findings revealed that services received by women during ANC and delivery influenced them to utilize skilled birth attendance services in their current and subsequent pregnancies.

i. Information and Advice During ANC Clinic

The respondents claimed that the information and advice they received during antenatal clinics from health care providers regarding the importance of utilizing skilled birth attendance services, the various types of services rendered during health facility deliveries, and about the risks associated with home delivery, influenced them to utilize skilled birth attendance services. The following quotes were echoed:

"I started attending ANC early and during monthly ANC follow-up visits, the nurse always reminded me on the need to deliver at the hospital giving me the benefits of health facility delivery and risks associated with home delivery this made me to make an informed decision to deliver at the hospital" (WFGD, 2-2).

ii. ANC Follow-Up by the Health Care Workers

The respondents said that having regular antenatal care follow-up during pregnancy by the health workers influenced them to utilize skilled birth attendance services during childbirth. They claimed that they had received information and advice on maternal and newborn health, different preventive and treatment services during ANC care which in turn made them to seek skilled birth attendance services. The FGD participant women mentioned the following statements:

"I remember that the nurse in the clinic could make a call two days before my next clinic day and remind me of the visit this ensured that I didn't miss any of my clinic days" (WFGD, 2-5).

Another one said;

"The nurse in the clinic closely followed me even by visiting to my home to get to know what could have befallen me if I missed a visit. It is this resilience that influenced many of the women in my community to seek skilled delivery services." (WFGD, 5-4).

iii. Ensuring Good Health of the Woman and Newborn

The findings also revealed that ensuring the health of the woman and the newborn was also identified as a factor that influenced women to utilize skilled birth attendance services. The following statements were noted:

"I*n the facility once admitted the midwives checked our abdomen and listened for the baby, they also measured our temperature and blood pressure. After delivery they examined our babies and told we showed us how to feed and handle our babies. They also advised us to observe whether the babies were urinating and passing stool" (WFGD, 6-3).*

Another one said:

Health workers examined us and our babies before they gave us permission to go home and also told us about the danger signs to be on lookout and also when to return to the clinic" (WFGD, 6-5).

iv. Early Detection and Management of Unforeseen Obstetric Complications

The research findings proved that the women thought that services received with regard to detection and management of unforeseen obstetric complications influenced them to utilize skilled birth attendance services. One of the participants claimed that:

"Anything can happen during the process of child birth, unforeseen complication like bleeding or high blood pressure can occur. For me I can't risk I better be in the health care facility where health workers can detect the issue early and intervene." (WFGD, 6-4).

Another woman claimed:

"*I have delivered all of my three children in the hospital because I know that in case of an emergency or a complication, the doctors and the nurses will attend to me immediately so I feel that my baby and I are safe in the hospital set up other than at home "(WFGD, 6-2).*

v. Good Interpersonal Relationship Between Health Care Providers and the Clients.

Study findings revealed that good interpersonal relationship between the health care provider and the clients motivated the women to utilize skilled birth attendance services in their future pregnancies. The respondents claimed that a friendly service and close follow-up from health workers encouraged them to utilize skilled birth attendance services. The following verbatim quotes corroborated this:

"I would like to utilize skilled birth attendance service because the nurses and doctors are very friendly. They talk nicely explaining every detail of the procedures. They clean our babies and change their diapers; they provide us with clean bed sheets and blankets. One feels as if she is still at the comfort of her home. Besides they also provide us with pain killers hence no after birth pain." (WFGD, 1-6).

4.4.3.2 Theme 3: Perceived Benefits of SBA Services

On data analysis, Women's perceived benefits of skilled birth attendance services emerged as one theme. The following issues that emerged

Category 1: Information regarding maternal and newborn health

The participants claimed that receiving information and advice on maternal and newborn health could be the benefits of skilled birth attendance service. The study findings indicated that women believed that skilled birth attendance services could enable them to have information and advice on maternal and newborn health. This, in turn, would enhance women's knowledge on the benefits of the services and the risks associated with not utilizing skilled birth attendances services during childbirth. One of the FGD participants mentioned the following:

"The health care workers advised us about balanced diet, everyone to have an individual birth plan and also taught us on how to care for our unborn babies. They also explained to us what we expect during labor and delivery." (WFGD, 6-5).

Category 2: Newborn care

The study findings of the current study noted that good newborn care practices were mentioned as perceived benefits of skilled birth attendance services. The participants claimed that newborns could receive proper thermal care, cord care, and vaccinations if women utilized skilled birth attendance service. The following FGD participants indicated these:

"The health care workers are providing good newborn care to our babies; they have also taught us how to bathe, feed and change the diapers. The health care workers have also immunized our babies before discharging us for home." (WFGD, 6-5)

"About the cord care the midwives taught us to avoid traditional methods of caring for it like application of saliva and cow-dung and gave us another drug to apply," (WFGD, 6-5).

One of the participants commented:

"I did not know application of cow-dung and saliva on the baby's cord stump is harmful. I appreciate the work nurses are doing to give women the right information." (WFGD, 6-4).

Category 3: Ensuring good health of women and the newborn

The findings of the study revealed that ensuring good health of the women and the

Newborn indicated a benefit of skilled birth attendance services. The FGD participants raised the following:

"Both the mother and newborn will be in good hands and in case of unforeseen emergency, it can be detected and dealt with in advance to ensure safety of both the mother and the baby." (CFGD, 1-2)

Another participant said:

"The delivery environment in the hospital is clean compared to the home environment and this will prevent one from contacting diseases like tetanus and infections of reproductive organs." (CFGD, 2-4)

Category 4: Disease prevention and treatment

The study noted that women and newborns could be prevented and treated from diseases such as tetanus and HIV/AIDS. The FGD participants explained that:

"I understand giving birth in the Health Facility is useful to prevent women from diseases like HIV and tetanus by ensuring clean delivery for instance if the woman is infected with HIV, the health workers intervene to prevent the transmission of the virus from the mother to the child." (CFGD, 4-5).

Category 5: Prevention and management of obstetric and neonatal emergencies

This study found that prevention, early detection and management of obstetric and neonatal emergencies as critical benefits of skilled birth attendance as revealed by KII participants revealed that:

"Hospital delivery can save the lives of both the mother and the baby. Sometimes the baby is born and refuses to cry the nurse and doctors' care for the baby until it cries." (KII, 9).

4.4.3.3 Theme 4: Community Support for Women to Utilize SBA Services

This theme explored the role of community members in support for women to utilize skilled birth attendance services in the study area. It emerged that some of the community members have been providing various types of support to women for them utilize skilled birth attendance services. This support includes:

Category 1: Transport

The study findings found the community members have organized for transport not only for pregnant women but also for any form of illness. The FGD participants indicated the following:

"In my community, we have organized the transport issues in case of need. The neighbors with vehicles have been engaged and charge an affordable cost that is usually contributed by community members; their contact numbers are always public for easy communication" (CFGD, 3-6).

Category 2: Assistance with household chores

The findings of this study noted that the communities provided support to the

Women with regard to household chores by taking care of the other children, managing household assets and activities, and preparing food until the woman gains strength to cater for her family.

"The community members provide support by protecting the household assets and the other children at home when the woman and other family members attend to hospital." (CFGD, 4-2).

Another one said:

One of the respondents said *"In my community we have a community support where every woman who is pregnant is identified and the community has arrangements on how to support this woman especially during the time of delivery. This is in terms of cash donation, provision of child item, transport arrangement and we even arrange on how to support the woman with domestic chores during this time of the need". (CFGD, 4-4)*

Another respondent said:

"We as neighbors support the woman while at hospital and at home, during hospitalization we take food and drinks and when they are discharged, we always visit her home and ensure we give cook her food and that of the family." (CFGD, 1-5).

Category 3: Advice and follow up by CHVS

The study findings indicated that participants received advice from community health volunteers regarding the benefits and utilization of skilled birth attendance services. Additionally, participants reported that their communities actively encouraged women to utilize skilled birth attendance services**.**

One respondent claimed: "As men and residents of this community, we appreciate our government for appointing some of the community members to be CHVs. We appreciate the CHVs as they have really supported our women during pregnancy by counseling them and even following on their progress until delivery. Some even go ahead deep into their pockets and pay boda-boda (motorbike) fee to ensure the woman delivers in the hospital". (CFGD, 2-6).

4.5 Objective 2: Strategies to Improve the Utilization of SBA Services

After analysis of qualitative data from questionnaire, FGDs and KII, one major theme for objective 2 on strategies to enhance skilled delivery services emanated. The study findings revealed that various strategies if implemented would go a step further to improve the utilization of skilled birth attendance services. The strategies under this theme were categorized as; personal, interpersonal, community and government levels as shown in the Table 4.16.

Table 4.16: Strategies to Improve Skilled Delivery Services

Theme: strategies to improve utilization of SBA services		
Category	**Level**	**Activities**
1	Individual related	Health education and awareness creation
2	Interpersonal related	Family dialogue
3	Community related	Regular pregnant women seminars
		Community support groups
		Community mobilization
		Community maternal/neonatal mortality, morbidity audits
		Community advocacy
		Community based transport services
		Follow-up of pregnant women by CHVs
		Community telephone communication
4	Government related	
		Health related
		Infrastructural improvement
		staff employment and sustainability
		Provision of enough medical supplies
		Policies
		Medical services payments policies
		Reproductive health polices
		Collaboration with stake holders

4.5.1 Category 1: Personal Level

4.5.1.1 Health Education and Provision of Advice

The participants reported that health education and provision of advice by health workers, political leaders, religious groups, and other stakeholders is a reliable strategy that can be used to highlight the importance of skilled birth attendance services, risks and consequences of home deliveries, and birth preparedness and complication readiness. The KII participants indicated the following:

"For instance, when women are taught about the risks of home deliveries and the benefits of delivering at the hospital, I think this can make them decide to utilize skilled birth attendance," (KII, 6).

Another Key informant said:

"Although Women get advised about their health during pregnancy, birth preparedness and complication readiness from as early as they know they are pregnant should be insisted." (KII, 12).

4.5.2 Category 2: Interpersonal Level

4.5.2.1 Family Dialogue

The findings indicated that family dialogues would be a good strategy to raise the awareness of key family members, with regard to pregnancy care, birth preparedness and complication readiness, skilled birth attendance services, and newborn care. The study also indicated that the pregnant women, their husbands/spouses, mothers-in-law, fathers-in-laws, and neighbors should be involved during the dialogue.

The key issues to be discussed during family conversations should be; The care the pregnant woman should get, birth preparedness and complication readiness, planning for the place of delivery, identifying SBA, arrangement on transport, birth companion and newborn care and post-natal care. The following statements evidenced this:

"I believe that the family and relatives of pregnant women should be involved in the care of the woman during pregnancy child birth and after delivery, the health care workers should visit the house of pregnant women to conduct family dialogues to bring on board the key family members on the need of birth preparedness and complication readiness so that harmful traditional practices to the pregnant woman could be thwarted and the pregnant women give birth in the health facility." (KII, 3).

4.5.2.2 Regular Seminars for Pregnant women

The study findings revealed that the pregnant women's seminars were one of the strategies that if employed could improve the awareness on the utilization of Skilled birth attendance services. The findings indicated that the pregnant women's Conferences to be held regularly besides the individualized care given during individual regular ANC visits in the health facilities. This would create a room for

interpersonal interaction between the pregnant women hence sharing of information among them.

One KII said:

"If we conduct monthly seminars for pregnant women in all wards in Kandara Sub-county, we create a room for our pregnant mothers to socialize and share their experiences. The information that will be shared will help them get prepared for the birthing process and this will boost the skilled deliveries." (KII, 5).

i. Women development groups

The study findings revealed that involvement of women development groups (chamas) as a good strategy to improve the skilled delivery services. The findings revealed that the women groups have great networks and heighten interactions with pregnant women, and can transmit key health messages to pregnant women. Women development groups can be a good avenue for mobilization of pregnant women for conferences and other interventions. The following statement by the respondents supported the findings:

"The women development groups in place have a network of women leaders who can help in mobilizing our pregnant women. The platforms can be used to instill knowledge to pregnant women and other women in the community on the benefits of hospital delivery as well as the risks of home delivery." (KII, 2).

4.5.3 Category 3: Community Level

4.5.3.1 Community Support Groups

The research findings revealed that strengthening community to have community support group is a good strategy whereby the community owns up the responsibilities of caring for its members. This was evidenced by a statement from one of the respondents when she said:

"In my community we have a community support group where every woman who is pregnant is identified and the community has arrangements on how to support this woman especially during the time of delivery. This is in terms of cash donation and transport arrangement. I believe if other communities adopt such strategies, then, this would motivate most of the women to deliver at the hospital" (KII, 15)

4.5.3.2 Community Mobilization

Study findings revealed community mobilization and advocacy emerged as a strategy to raise the awareness of the communities with regard to the utilization of skilled birth attendance services. The participants indicated that letting the community understand about risks of home delivery and the benefits of hospital delivery to the pregnant women of their community would enhance the support of community to seeking of skilled delivery services.

4.5.3.3 Community Maternal/Neonatal Deaths/Morbidity Audits

The findings also revealed that involving the community in maternal /neonatal audit could be a good avenue of discussing what happened and planning on how to tackle such challenges that resulted to fatality or near death and to avoid a recurrence.

One of the participants said:

"My suggestion is that the health facility to organize on how to be presenting, cases of women who gave birth at home or even at the hospital and encountered health problems and complications, for community mobilization." (KII, 17).

i. Community Advocacy and Training

The study reported that maternal deaths that occurred in the communities could also be used as advocacy and community mobilization tools to mobilize the community to utilize skilled birth attendance services. The following statement corroborated this:

"*I suggest that when a mother dies during giving birth the stake holders should take that unfortunate opportunity advocacy tool and let the community to know their role in preventing such an occurrence again." (KII, 8).*

Another respondent said:

"*I think all people, men and women of this area need to be trained and counseled about the importance of women attending clinics during pregnancy where they are assessed treated and advised on the importance of delivering in the hospital under a health worker would increasingly improve skilled delivery. I know a woman who delivered at home only because no one informed her on attending clinic and also importance of delivering at the hospital" (KII, 10).*

ii. Community Based Transport Services

The findings further revealed that the community should plan on how to transport its members to the hospital when need arises using the available local means. However, the community also should liaise with the nearest health facility for ambulance services to improve the utilization of skilled birth attendance in the community One participant explained the following:

"The community should come up with affordable means to transport its members to the hospital as well as liaise with the hospital for ambulance services as this will ensure no delay in transporting the woman in labor to the nearest health facility." (CFGD, 1-4).

iii. Community Women Ambassadors of Skilled Delivery Services

The study findings also found that the women who deliver at the health facilities should be awarded a title of "Health ambassadors" and therefore they should become good models of other women in the community and this would go a mile in up-scaling the utilization of skilled delivery services in the community. One of the Key informants claimed:

"*We can begin with women who give birth in the health facility and make them ambassadors. If this happen the facilities will be aiming higher to make women satisfied with the quality services they provide because the ambassadors will be relaying this information to the to the community about the services they received." (KII, 14).*

iv. Community Health Volunteers (CHV) Follow-Up of ANC Mothers

The study findings revealed that follow-up of a pregnant woman is a good strategy in ensuring a skilled delivery at the end of gestation it will also enable pregnant women to have basic health and counseling services as per the recommended ANC visit schedules. The respondents indicated the following statements:

"Although Women get advised about their health during pregnancy, birth preparedness and complication readiness from as early as they know they are pregnant, unit CHV should do follow up of these women as some of them may forget that they are nearing the expected date of delivery (EDD) and this may increase chances of hospital delivery" (KII, 1).

Another respondent claimed:

"The health care workers should open a register of all pregnant women at first contact with a woman seeking ANC services with EDD. Contacts and the contact of the CHV where that woman comes from and liaise with the CHV for follow up visits to ensure the woman delivers in the health facility" (CFGD, 2-2).

v. Community Telephone Communication

The study findings revealed that phone communication is a good strategy to adopt since almost everyone in the community owns a phone, they could be used to notify labor for CHVs and the health workers. the health care providers should provide the hospital telephone numbers and ambulance driver's telephone numbers to the pregnant women during the clinic and to the community at large for communication purpose when a woman is in distress. The participants reported this:

"Since all of the community members own a mobile phone, why don't the hospitals provide their mobile phone number to the pregnant women and to the community at large so that they can call them when a woman is giving birth? I think this could be a better way to avoid wasting time and also to ensure the health care workers prepare themselves ahead of the arrival of the woman." (CFGD, 6-3).

4.5.4 Category 4- Government Related

4.5.4.1 Health Related

4.5.4.1.1 Infrastructural Improvement

The findings of this study revealed that increasing the facilities that offer skilled delivery services as one of the strategies the government can use to increase skilled delivery services as there is only one Sub-County hospital and two faith-based facilities that offer skilled deliveries in the Sub-County. This was one of the hindrances that caused many women not to deliver at the hospital as one of the respondents said:

"In our village we have about six dispensaries that offer ANC services but a woman is told to look for a bigger hospital to go and deliver there. These hospitals are far. My question is why doesn't the government improve one of these dispensaries in every ward at least to be offering delivery services? This could really improve on this issue" CFGD, 1-6).

4.5.4.1.2 Employment of More Staff in the Facilities

The study findings revealed that there is shortage of staff in the health facility to handle the population of the catchment area and therefore employing more staff and replacing those who leave the service by natural attrition or by any other means is a good strategy that could increase the skilled delivery services. This is evidenced by claims from the respondents:

Another one said

"There *were only two nurses in labor ward with ten mothers in labor. I witnessed two women deliver alone as the midwives were busy attending to other women therefore; I propose more staff to be allocated in delivery rooms.*" *(CFGD, 3-5).*

4.5.4.1.3 Training Staff on Ethics and Professionalism

The study findings found that some of the staff members disregard medical ethics and act unprofessionally and therefore further training would be a good strategy to enhance skilled delivery services. One of the respondents said:

"I *think most of health care workers are not adequately trained on better service delivery and privacy. I candidly remember during delivery of my last born one of the staff told me that in labor ward there is no privacy and that if I don't cooperate, I should leave the hospital and go and deliver at home with all my privacy. In my view there should be continuous training of health care staff on professionalism and to take issues of client privacy with a lot of care for them to accept to deliver there*". *(CFGD, 3-3).*

i. Provision of Enough Medical Supplies

The study findings found that the government should provide enough medical supplies in the facilities as one strategy to increase skilled delivery services. This also helps to reduce other costs that the women undertake in buying the supplies as can be evidenced by the following respondent's statement:

"Availability of medical supplies is key to health seeking behavior of women in this community. When there are enough supplies, most women come to seek health care because there is no cost as all items are available" (KII, 4).

1. Polices

i. Medical Services Payments Policies

The findings revealed that the government should support and enforce that all women should have a medical service payment policy to cater for costs of delivery services as a strategy to enhance skilled deliveries in the area. The respondents said:

"Why doesn't the government make it mandatory for all women to have health policies like Linda mama, NHIF and Other insurance health policies? This would really boost women to deliver at the hospital as they will not have to pay any money from their pockets. Like Linda mama is absolutely free.one needs only to provide an ID card and she is registered freely" (CFGD, 2-3).

ii. Reproductive Health Polices

The findings also revealed that the government should enforce, monitor and evaluate its reproductive health like free maternal health. UHC programme and beyond zero to find out their implementation, process and effectiveness as these are good strategies to enhance skilled delivery services. One of the KII respondents said;

I think the free maternity services, beyond zero and UHC programme if well implemented, monitored and evaluated could be very good strategies to increase use of the skilled deliveries in our community." (KII, 16)

iii. Collaboration with Other Stakeholders

The research findings found that the government should collaborate with other stake holders like department of agriculture, gender, children, education, religious leaders, administration department, NGOs and private health care providers as this would bring synergy and boost the skilled delivery services. One of the KII Said.

"The government ought to work hand in hand with other stake holders in health if it wants to win this battle of home deliveries as they have influence on our women. Take

for example churches, chiefs, teachers, NGOs like jacaranda, private health facilities. If all are involved then this problem will be a thing of the past in this area. (KII, 10).

4.6 Model Formulation and Development

Study findings from baseline study and extensive literature review guided the researcher to identify the strategies to develop a model of care. The components of theory of change (inputs, activities, outputs and the outcomes) guided the researcher to come up with a model of care. For the purpose of model development, the researcher developed a model comprising of three malleable and attainable categories of the theme namely: personal, interpersonal and community level and incorporated the subcategories of the category 4 (Government level). The research adopted eight steps in model development adopted from Havenga, et al, (2014).

4.6.1 Objective

The purpose of the model was to provide guidance based on evidence to improve the utilization of skilled birth attendance services in Kandara Sub-County Kenya while the objective of the study objective was to describe the strategies that would help to overcome the problems and challenges in the study area as far as utilization of skilled birth attendance services is concerned.

4.6.2 Scope of the Model

The model if verified and adopted is to be implemented in the communities and the health facilities in the study area and also in the republic of Kenya at large in planning, implementation, monitoring and evaluation of skilled birth attendance services. The targeted users of the proposed model are: community members, health care workers, health managers, and health policy makers.

4.6.3 Evidence from Baseline Study

A baseline study was conducted between January and March 2022 and the research findings are as indicated in the Table 4.17 below. The research findings consisted of

problems and strategies. The strategies were used as evidence to develop the model of care.

Table 4.17: Baseline Study Findings

S/N	Identified Problem and causes	Solution /strategy to solve the problem/potential behavior	Level of action
1	Low ANC visits	Educate and counseling men and women in the community on the importance of ANC and safe delivery.	Personal/interpersonal community
2	Poor knowledge on danger signs	Educate and counseling men and women in the community on the importance of ANC and safe delivery	Personal/interpersonal community
3	Lack of information about skilled delivery services offered in hospitals	Sensitization of women on the importance of skilled deliver	Personal/interpersonal community
4	High number of unskilled deliveries	Application of multiple strategies	Personal/interpersonal community
5	Influence by Religious and cultural beliefs	Sensitization of women on the importance of skilled delivery	Personal/interpersonal community
6	Lack of community support	Improvement in community-based support systems	Community
7	Lack of satisfaction with service delivery	training of health care staff on safe delivery and professionalism.	Government
8	Few health care workers in the facilities	Increase the delivery personnel (More nurses and doctors for better services)	Government
9	Few facilities offering skilled delivery services	Increase and improve the facilities to offer skilled delivery services	Government

4.6.4 Identified Themes and Categories

The data analysis yielded to one main theme named: “Strategies” which was further categorized in to four categories namely: individual, interpersonal, community and government levels. The strategies were used to come up with a model of care as explained below.

4.6.4.1 Category -1 Personal Level

A- Training- pillars of safe motherhood adopted from Goffman et al (2019). Focused Antenatal Care (FANC). This is personalized care provided on a pregnant woman who emphasizes on overall health status, preparation for childbirth and readiness for complication.

It is goal oriented that is; friendly, simple, beneficial and safe to pregnant women with the aim of achieving good outcome of both the mother and the baby. The main objectives of FANC are early detection and treatment of problems and Prevention of complications using safe, simple and cost-effective interventions namely:

1) Giving tetanus Toxoid vaccine to pregnant women to prevent the mother from tetanus and child from neonatal tetanus
2) Giving iron and Foliate supplementation to prevent anemia
3) Ensuring environmental hygiene to prevent intestinal worms and also administering drugs like the Mebendazole and Albendazole
4) Birth preparedness and complication readiness
5) Have a birth plan and discuss the requirements of the expecting mother and explain the things required in the baby mother package.

    I. Know when the baby is due for delivery
    II. Identify a skilled birth attendant
    III. Identify a health facility for delivery or emergency
    IV. List danger signs in pregnancy and delivery and knows what to do if they occur
    V. Identifies a decision maker in case of an emergency
    VI. Source of available funds in case of an emergency
    VII. Transport plan in case of an emergency
    VIII. Has a birth partner /companion for the birth
    IX. Collected the basic supplies for the birthing process

B. Health promotion - This is done using health messages and counseling

1. **Clean and safe delivery**

This is to ensure that all birth attendance have the knowledge, skills and the equipment's to perform a clean and safe delivery. (Skilled delivery attendant and enabling environment (equipment, drugs and facilities). Also ensure that aseptic measures are used to prevent and control infections by the mother and also the nurse. Provision of SBA- mostly at the hospital but can still occur at the community (domiciliary practice).

2. **Essential obstetric care**

To ensure that essential care is made available to all women who need it. Complications during pregnancy and child birth affect not only the women but their newborns as well.

3. **Targeted post-partum care**

This is done to assess the health of the mother and the neonate such as how the baby is been breastfed, breast care, umbilical care, bonding of mother and child. Moreover, postpartum care also comprises of providing awareness regarding family planning, managing danger signs and symptoms seen in both mother and child.

4. **Essential Newborn Care**

It is a comprehensive strategy designed to improve the health of newborns through interventions before conception, during pregnancy and as soon at birth and in postnatal period. The interventions include: early initiation and exclusive breastfeeding

Thermal care including prompt drying and covering at birth, maximizing skin to skin contact, delayed bathing maintaining warm chain. Hygiene practices including cord care and caregiver hand washing.

4.6.4.2 Category 2: Interpersonal Level

This is enhancing the relationship of the mother with other significant people in their inner cycle

1) Family dialogue-Family dialogues and Partner involvement and neighborhood check- neighbors should always check on how their pregnant neighbors are faring and give the much-needed support at any level and stage of gestation, conducting family dialogues and conversations, regarding skilled birth attendance services with the involvement of older families and significant others, pregnant women, neighbor, social network leaders and others could be one intervention
2) Regular pregnant women seminars- For support

Opening what's-app group for all pregnant mothers recruited for intervention group this was to aid in reminding each other on the next return day.

3) Women development groups- to reach the women and the community on Individual birth plan preparedness: source of funds, birth companion, and transport arrangement basic requirements for birthing process and attitude change towards health facility deliveries and the health workers as well.

4.6.4.3 Category 3: Community Level

This is the role of the community in ensuring its women seek skilled delivery services

1. Community support groups- the community mobilize for resources and plan for the health of their own members for sustainability. **S**ocial support, ensure a pregnant woman has developed her own IBP and come to her support if needed.
2. Community mobilizations community members should encourage the pregnant women to deliver in a health facility manned by a skilled health care worker.
3. Community maternal/neonatal mortality/morbidity audits
4. Community advocacy--Engage community leaders, religious leaders and leaders of women development groups, to undertake advocacy and social mobilization activities regarding skilled birth attendance services.
5. Community based transport services
6. Follow-up of pregnant women by CHVs

7. Community telephone communication- Implement community based, multi-media, and interpersonal communication approaches to improve communities' perceptions and knowledge about skilled birth attendance services.

Cultural/religious factors and social change-Develop key messages that target the, sociocultural beliefs and importance of skilled birth attendance services

4.6.4.4 Category 4: Government Policy

A. Health related

I. Infrastructural
II. Employment of more health workers
III. Staff training on medical ethics
IV. Enough provision of medical supplies

B. **Legislation-** coming up with guiding polices on reproductive health

a) Medical services payments policies

1) Linda mama - all pregnant mothers need to be registered for Linda mama
2) National Health Insurance Fund
3) Other insurance health policies

b) Reproductive health polices

I. Free maternal/child health services
II. Universal Health Care.

c) **Enforcement-** ensuring that all stake holders adhere to polices and guidelines

d) Supervision - of services offered to ensure the set standards are implemented

e) **Evaluation-** to evaluate/ analyze whether the set polices/ guidelines are achieving the set goals/standards

4.6.5 Development of Draft Model of Care

Figure 4.5 below shows the developed draft model of care

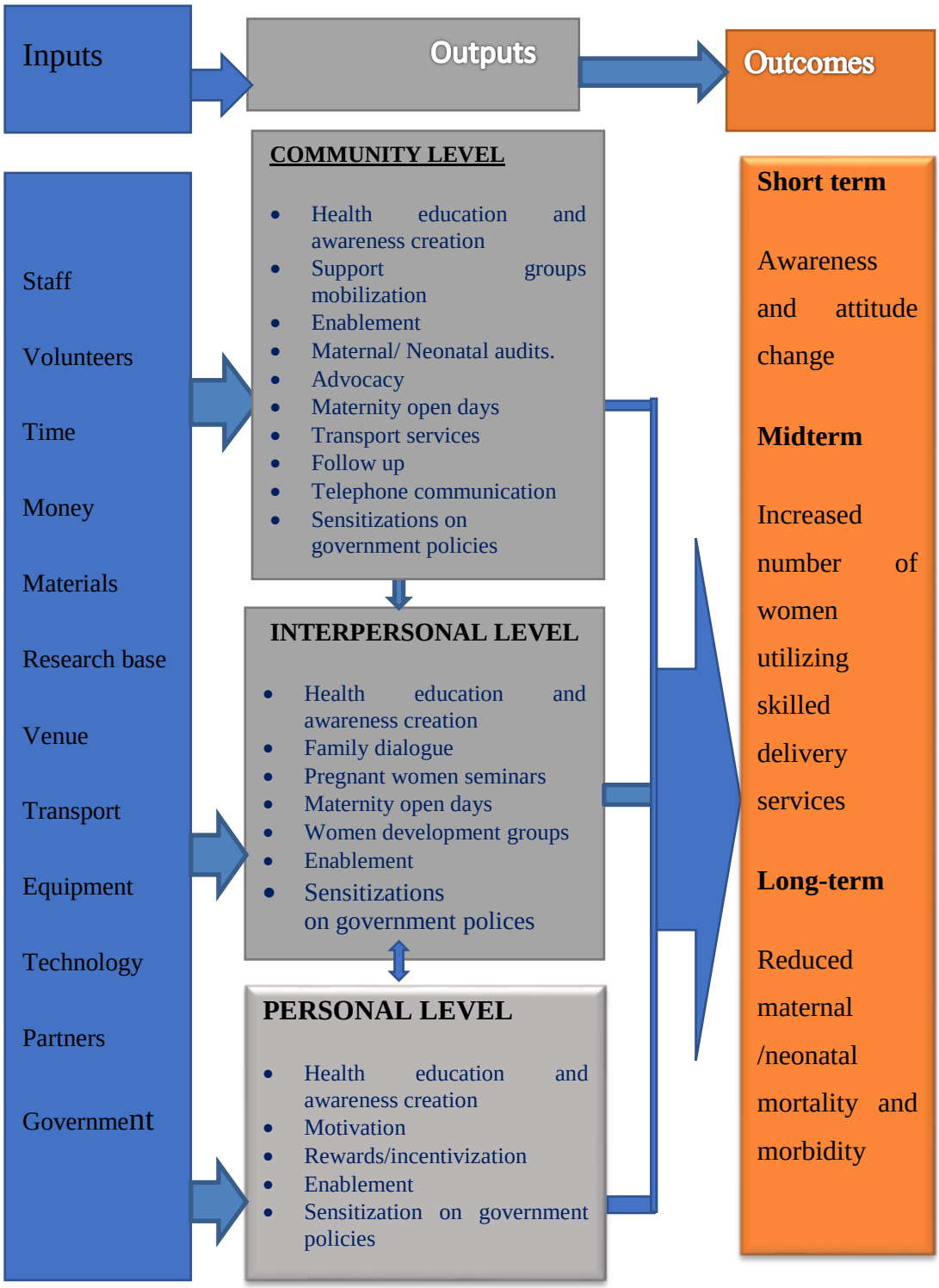

Figure 4.5: The Developed Model

4.6.6 Expert Review and Opinion-(Validation)-Recommendations Effected

The average score of all experts was considered as the experts 'consensus score (Jorm, 2015).

Table 4.18 below shows the scores awarded by the experts, the mean score and the action taken for each criterion. Eight out of ten experts had returned their scores by the time the analysis was done hence their scores and recommendations were used revision of the model.

Table 4.18: Expert Scores and Mean Score per Criterion/ Expert

S/N	Criterion/ Expert's score	1	2	3	4	5	6	7	8	Mean Score	Comment/ action taken
1	Clarity presentation Is the Model precise, simple and easily understandable?	5	4	5	4	2	4	4	4	4.13	accepted
2	Specificity Is the Model being specific and focused on improving the utilization of skilled birth attendance services?	5	4	5	5	2	4	4	4	4.35	accepted
3	Reliability Can the model ideally be used consistently in other in similar circumstances?	4	4	5	4	4	4	5	4	4.25	accepted
4	Clinical Flexibility Are Exceptions of the model identified?	5	4	4	3	3	4	4	4	4.0	accepted
5	Effectiveness Is the model able to meet the needs and to solve the problems identified by the study findings?	4	4	4	4	4	5	5	5	4.13	accepted
6	Validity Is the model based on evidence from correctly analyzed and interpreted data?	4	4	4	4	4	4	4	4	4.0	accepted
7	Relevance Is the model appropriate for improving the utilization of skilled birth attendance services?	4	4	5	4	4	4	4	4	4.13	accepted
8	Applicability Is the module applicable in the given scope?	5	4	5	4	3	4	4	4	4.25	accepted

S/N	Criterion/ Expert's score	1	2	3	4	5	6	7	8	Mean Score	Comment/ action taken
9	Acceptability: realistic and ambitious, in line with the existing maternal health strategies. s.	4	4	4	5	4	4	4	4	4.13	accepted
10	Achievability: could be done by the target group as described in this study.	5	5	4	4	4	4	4	4	4.25	accepted
11	Utilization review: indications of ways in which adherence may be monitored, were explained as operationalization of the strategies	4	4	4	3	4	4	4	4	4.0	accepted
12	Output Plausibility: Does the theory present a plausible solution to a problem? Is there a logical and defensible relationship between the solution pathway and the problem? Is it reasonable to believe that if that path is chosen, this will represent a change, by reducing or eliminating the problem?	4	3	3	3	3	4	3	3	3.25	Modifications done as per inputs and recommendation of the experts
13	Model content and structure: Are linkages depicted in the diagram are logically connected? Are there any gaps in the logic or any breakdowns in temporal sequencing?	4	5	3	4	2	4	4	3	3.65	Modifications done as per inputs and recommendation of the experts
14	Is there evidence for the linkages of the model with existing theories? Consistent with existing, general Theories of Change (if any exist)? Is there sufficient research-based theory that supports the logic and linkages?	4	4	4	4	4	4	3	3	3.75	Modifications done as per inputs and recommendation of the experts

4.6.7 Final Draft of the Model of Care

After the analysis and validation, the expert opinion and recommendations were considered and incorporated culminating to a final draft model as shown on the figure 4.6 below.

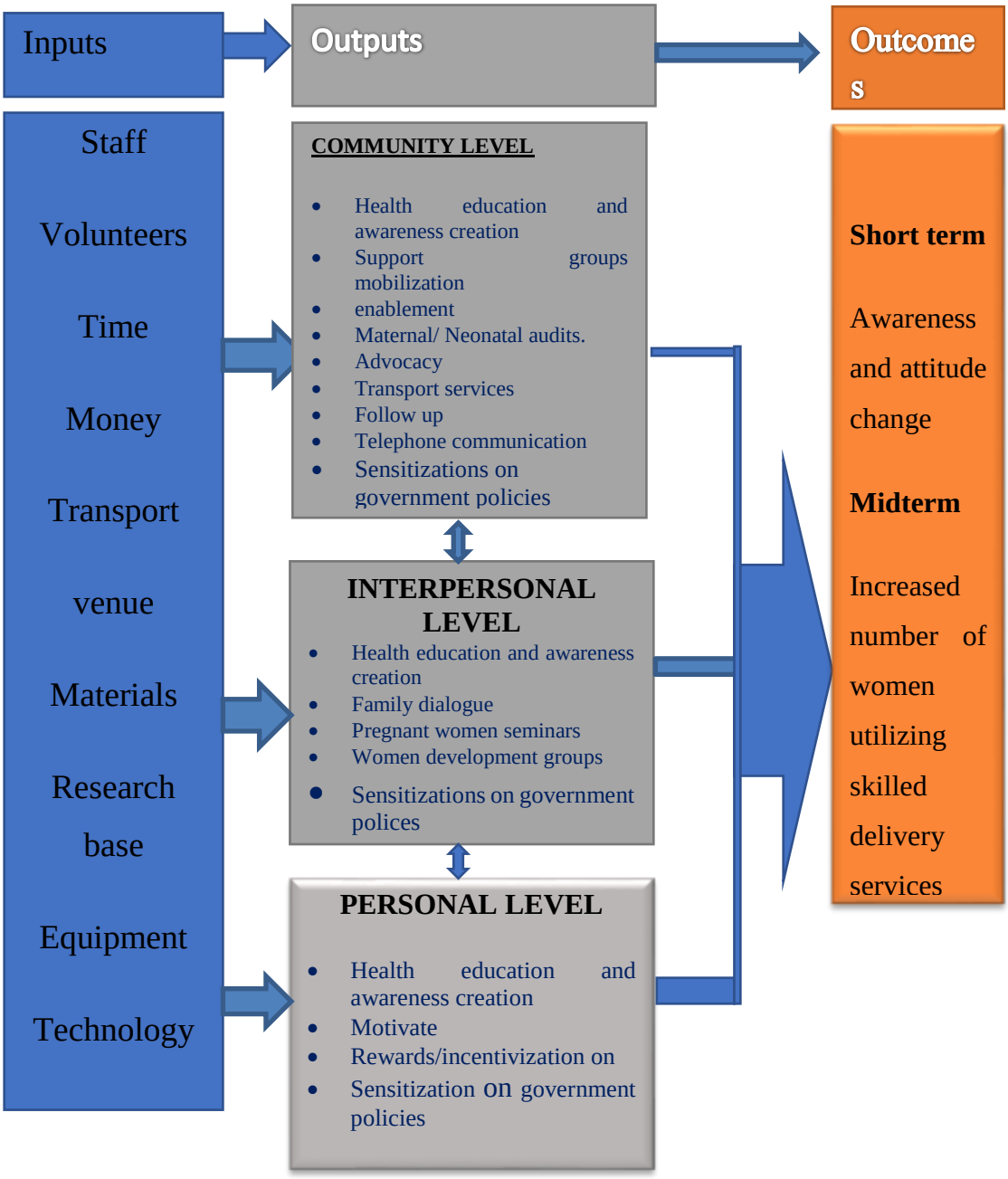

Figure 4.6: The Validated Model of Care

4.7 Testing of the Developed Model of Care

Response rate

A total of 554 individuals were initially screened for their eligibility to participate in the research. From this pool, 154 participants were deemed suitable and were assigned to a study group. Each study group contained 77 participants who then underwent the designated intervention. All 154 participants successfully completed the follow-up phase. For the main phase of the analysis, all 154 participants were included and assessed according to their respective study conditions as sown in figure 4.7 below

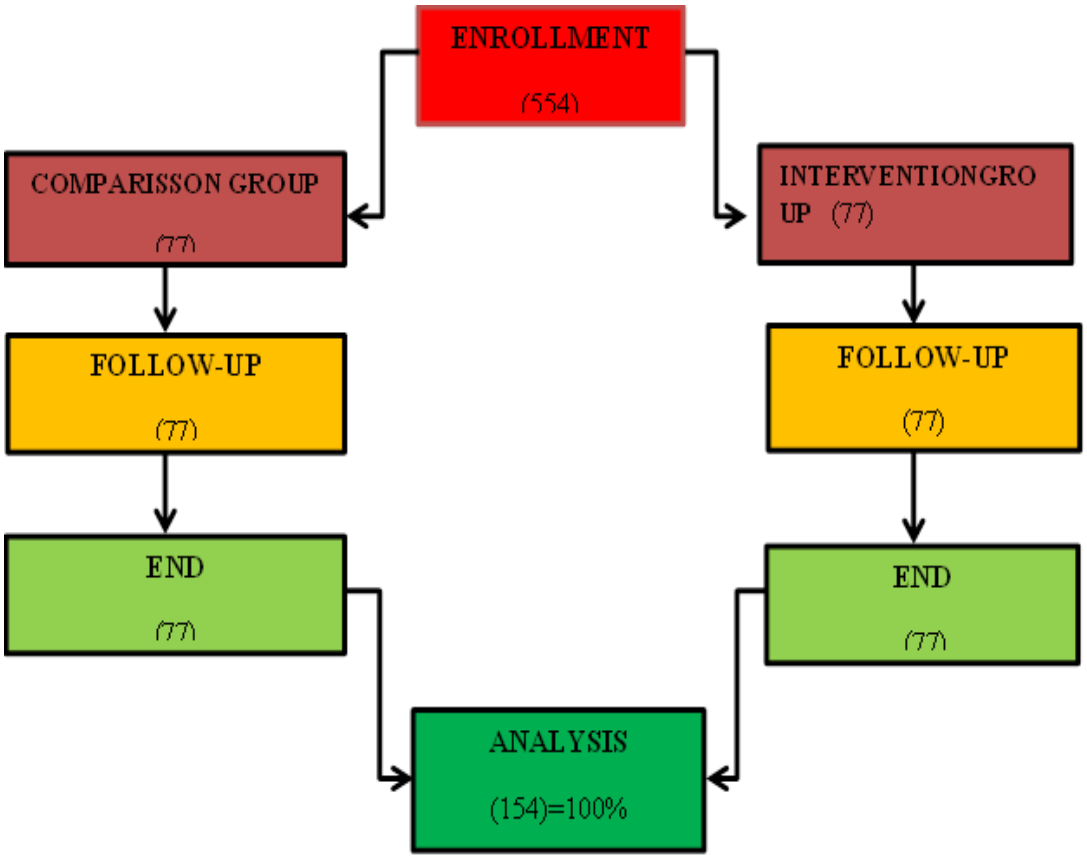

Figure 4.7: Participant's Enrollment and Follow-up Flow

Outcome

The proportion of skilled deliveries in the intervention group was 98.7%, while in the comparison group, it was 85.7%. Overall, the proportion of skilled deliveries in both groups was 88%. As shown in table 4.19.

Table 4.19: Percentage of Skilled Deliveries

Group	Area	Sample size	Skilled deliveries (Success)	Proportionate of success	%
Intervention g	Ngararia ward	77	76	0.99	98.7
Comparison g	Gaichanjiru ward	77	66	0.86	85.7
Lost to follow-up		0	-	-	-
Total		142	0.880	88	

4.8 Hypothesis Testing

The two groups assigned to either comparison or interventional groups and the outcomes are called successes and failures. In this study, the researcher concentrated on proportionate of successes in each wing (number of skilled deliveries) as tabulated in table 4.20.

Table 4.20: Proportionate of Deliveries Showing the Skilled Deliveries (Success)

Group	Area	Total sample Number	Lost follow up	Completed study	Skilled deliveries (Success)	Proportionate	%
Intervention group	Ngararia ward	77	0		76	0.99	99
Comparison group	Gaichanjiru ward	77	2		66	0.86	86
Total		**154**	**2**	**154**	**140**	**.0.91**	**91**

4.8.1 The Z-Score

The study used SPSS version 27 to calculate z-score as shown in table 4.21

Table 4.21: Two Sample for Means

z-Test: Two Sample for Means		
	Variable 1	**Variable 2**
Mean	0.99	0.86
Known Variance	0.01	0.12
Observations	77	77
Hypothesized Mean Difference	0	
z	3.08	
P(Z<=z) two-tail	0.002	
z Critical two-tail	1.96	

4.8.2 Conclusion of Hypothesis Testing

The z sore (3.08) is greater than the critical value (1.96) as well as the p<alpha, as p = 0.002 and alpha set at 0.05, In this regard, the result is statistically significant and therefore the H0 was rejected.

The Study rejected the null hypothesis that "There is no statistically significant difference in the level of utilization of skilled delivery services between the intervention and comparison groups after testing of the developed model of care. The study findings revealed sufficient evidence to support the claim that there is statistically significant difference in the level of utilization of skilled delivery services between the intervention and comparison groups after testing of the developed model of care as p < alpha and therefore confirmed the alternative hypothesis.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDITIONS

5.1 Introduction

In this chapter, the research findings were considered with specific reference to the objectives/research questions. Data was interpreted and the results of the findings correlated with both empirical and theoretical literature available. The conclusion relates directly to the specific objectives/research questions. The recommendations were deduced from conclusion and discussion of the findings.

5.2 Discussions

5.2.1 Client's Experiences on Skilled Delivery Services

The findings clearly depicted a high number of unskilled deliveries, with 106 (30.8%) both circumstantial and by choice, which is below the national and global targets of 100% skilled deliveries (KNBS, 2015).

Lack of satisfaction with service delivery was reported by 55% of respondents. This correlates with another study done in Ethiopia, which found that negative childbirth experiences with facility delivery could deter women from utilizing skilled birth attendance services in future pregnancies (Bohren et al., 2014).

The study highlighted the influence of previous childbirth locations on subsequent skilled birth attendance utilization, aligning with Ethiopian research emphasizing the impact of prior home births (Kifle et al., 2018). Harsh treatment by health workers emerged as a significant deterrent to hospital delivery, consistent with studies in Ethiopia and India highlighting substandard care and maltreatment (Shiferaw et al., 2020; Mayra et al., 2022).

Health facility-related factors, including resource shortages, limited services, and misconceptions, influenced delivery location choices, echoing findings from a study in developing countries (Bohren et al., 2014). The presence of danger signs during

pregnancy influenced facility-based deliveries, akin to research in developing countries emphasizing health status, past complications, and socio-economic factors (Afulani et al., 2016).

Availability of life-saving interventions in health facilities positively influenced skilled birth attendance utilization, consistent with studies in Northern Ethiopia and Gambia emphasizing the perceived competence of healthcare workers (Lerberg et al., 2014; Sialubanje et al., 2015).

Past experiences of obstetric complications motivated women to choose skilled birth attendance, aligning with research in rural Zambia (Sialubanje et al., 2015). Satisfaction with previous care influenced women to deliver in the same location, contrasting with a study in North West Ethiopia that reported a decreased probability of subsequent health facility delivery after a prior facility birth (Gudeta et al., 2021).

5.2.2 Strategies to Improve the Utilization of Skilled Delivery Services

The study underscores that implementing strategies such as educating, counseling, and sensitizing the community about the importance of ANC and safe delivery can enhance the use of skilled delivery services. This aligns with a study in Nepal, affirming the effectiveness of mass media as a strategy in influencing maternal and child healthcare service seeking (Shifraw et al, 2016).

The findings emphasize that the establishment of community-based support systems is a viable strategy to increase the utilization of skilled delivery services. This corresponds with a Ngabian study utilizing the three-delay model, revealing an effective strategy for increasing skilled delivery services (Fergusion et al. 2020).

The study employed a Quasi-experimental design, corroborating with the understanding that such studies estimate intervention impacts without random assignment (Thomas, 2022).

The study discovered that implementing strategies in the developed care model significantly boosted skilled delivery service utilization, aligning with Barker's (2016)

study on hearing-aid use. This highlights the effectiveness of the COM-B behavior model in understanding of interventions in healthcare settings.

The research findings align with studies from Ethiopia (Andargie et al, 2020) and Alderman, supporting the effectiveness of checklist-based Box System Interventions and the use of theories of change and logic models in enhancing development. Additionally, the results resonate with Balogun's (2020) study in Nigeria, highlighting the positive impact of mobile phones on promoting maternal and child health. The application of multiple strategies also finds support in a study from Nepal, indicating a marked increase in skilled attendances with the deployment of integrated strategies (Sendo et al. 2021).

5.2.3 Formulated a Model of Care

The study findings revealed that well developed model can be used in promoting health services in the study findings. This correlates with a study by Parker et al., (2021) that he principles of model development must be built on prevailing standards in the healthcare setting and must be established on some assumptions .The model formulation was based on nursing care models approach with regard to the organization and delivery of patient care this was in line with a study done by (Anneli,(2013) that states that model development is one of the trademarks that prove the uniqueness of a profession as a body of expertise.

5.2.4 Testing of the Developed Model of Care

The study tested the effect of the developed interventional model of care on utilization of skilled deliveries among women of reproductive age in Kandara Sub-County this correlates with a study done by Thakur & Shah, (2021) that found that interventional studies are specifically designed to evaluate direct impact of therapeutic or preventive measures on outcomes by assigning participants into treatment/intervention or control group.)

The study utilized a Quasi-experimental study (an intervention study design) was used to test the developed model of care this correlates study that proves that A quasi-

experiment is an empirical interventional study used to estimate the causal impact of an intervention on target population without random assignment (Thomas, 2022).The study findings revealed that implementation of strategies in the developed model of care significantly improved the utilization of skilled delivery services significantly as the proportion of skilled deliveries in the intervention group was 13% higher than that of the comparison group this correlates with findings of another study done by Barker (2016). Which proved to improve hearing-aid use in adult auditory rehabilitation and provided self-management support after applying the COM-B behavior model and behavior change wheel. The findings of this study underscore the notable and favorable impact of the model of care on the utilization of skilled delivery services among women of reproductive age in Kandara Sub-County. Through rigorous testing, the model exhibited its effectiveness in enhancing health outcomes and addressing the specific challenges faced by this population.

Several other interventional studies have also yielded related findings, supporting the efficacy of various strategies and interventions in promoting positive health outcomes. For instance, Smith et al. (2018) conducted a study on a community-based education program, reporting a significant increase in skilled delivery service utilization among women in rural areas.

Furthermore, a randomized controlled trial by Johnson et al. (2019) explored the implementation of a maternal health awareness campaign, leading to improved knowledge and utilization of skilled delivery services in urban settings.

Additionally, a systematic review by Brown et al., (2020) examined multiple interventions aimed at reducing barriers to skilled delivery services, highlighting the effectiveness of community health worker programs in increasing access and utilization among underserved populations.

These interventional studies, alongside the current research, collectively reinforce the importance of targeted interventions in improving maternal healthcare outcomes and addressing barriers to accessing skilled delivery services. The evidence presented here supports the need for continued efforts to implement effective strategies that positively impact women's health and childbirth experiences.

These results are consistent with previous interventional studies that have shown promising outcomes in different settings and populations.

The study by Roberts et al. (2017) demonstrated that mobile health interventions can effectively reach and engage pregnant women in remote and underserved areas, providing them with vital prenatal education and reminders. This approach has the potential to enhance knowledge about the benefits of skilled delivery services and improve maternal health-seeking behaviors, as evidenced by the increased utilization rates observed.

Similarly, the community-based intervention evaluated by Anderson et al. (2019) showcased the significance of community involvement in promoting skilled delivery service utilization. By establishing community birth centers and training SBA, the intervention targeted the specific needs of marginalized populations, resulting in improved access to skilled care during childbirth.

The study by Lee et al. (2021) explored the role of telemedicine in expanding access to prenatal care and counseling, particularly in remote and underserved regions. This approach has proven effective in bridging the gap between expectant mothers and healthcare providers, leading to an increased uptake of skilled delivery services.

Furthermore, the systematic review by Thompson et al. (2022) shed light on the importance of addressing financial barriers to maternal healthcare. The implementation of conditional cash transfer programs has been shown to positively influence pregnant women's decisions to seek skilled delivery services, especially among low-income populations.

Overall, these interventional studies, in conjunction with the current research, provide valuable insights into the potential of various strategies in promoting skilled delivery service utilization and enhancing maternal health outcomes. By considering the successes of these interventions, healthcare policymakers and practitioners can design more effective and tailored approaches to address regional disparities and ensure equitable access to skilled care for pregnant women.

5.3 Conclusion

5.3.1 Client's Experience on Skilled Delivery Services:

The findings of the study revealed a notable prevalence of unskilled deliveries, with 106 instances (30.8%) attributed to both circumstantial factors and personal choices. This proportion falls below the expected benchmarks of 100% skilled deliveries set at both national and global levels. Furthermore, dissatisfaction with service delivery was reported by a significant majority, comprising 55% of the respondents. These findings underscore a pressing need to address barriers to accessing skilled birth attendance and improve the quality of maternal health services to ensure safer childbirth experiences.

Moreover, the study shed light on the influential role of previous childbirth experiences on the decision to seek skilled birth attendance for subsequent deliveries. Factors related to health facilities, including resource shortages, limited services, and misconceptions, were identified as key determinants influencing where deliveries took place. Conversely, the presence of life-saving interventions in health facilities emerged as a positive factor driving the utilization of skilled birth attendance. Additionally, past experiences of obstetric complications served as a motivating factor for women to opt for skilled birth attendance, highlighting the importance of addressing maternal health concerns comprehensively.

5.3.2 Strategies to Increase Utilization of Skilled Deliveries:

Essential strategies identified in the study include community education and outreach programs, improving healthcare infrastructure and access, addressing financial barriers, and promoting the significance of skilled attendance during childbirth. The research highlights the effectiveness of implementing a combination of approaches such as community education, counseling, and sensitization about the importance of antenatal care (ANC) and safe delivery in boosting the utilization of skilled delivery services. Moreover, the findings underscore the potential of establishing community-based support systems as a viable strategy to further increase the uptake of skilled delivery services.

5.3.3 Formulated Model of Care

A comprehensive model of care was developed based on an extensive literature review and insights from baseline study findings. The model integrates various strategies to overcome barriers and improve access to skilled care. It includes specific interventions, timelines, responsible parties, and expected outcomes, ensuring a structured approach to addressing both demand-side and supply-side factors affecting skilled delivery utilization.

The comprehensive model of care was meticulously designed following scientific principles for model development and validation. It takes a holistic approach by addressing client experiences and incorporating identified strategies to improve maternal healthcare access and quality. By tackling both demand and supply factors, the model aims to enhance overall delivery services and increase the rate of skilled deliveries, ultimately leading to better maternal and neonatal health outcomes.

5.3.4 Level of Utilization of Skilled Delivery Services after Testing the Model of Care

The effectiveness of this comprehensive model is evidenced by the significant improvement in delivery outcomes. In the intervention group, the proportion of skilled deliveries reached an impressive 98.7%, compared to 85.7% in the comparison group. This substantial increase demonstrates the positive impact of the implemented strategies, showcasing the model's success in improving the rate of skilled deliveries and ultimately contributing to better maternal and neonatal health.

5.4 Recommendations

Based on the research findings, the following recommendations with suggested actions for various stakeholders:

5.4.1 Improving Health Facility Conditions and Health Worker Attitudes

Health Ministries at both national and local levels with collaboration of local community leaders, faith-based organizations and other stake holders should take

action to improve the conditions of health facilities, ensuring adequate resources, infrastructure, and staffing. Hospital administrators and healthcare managers should prioritize training programs to enhance health worker attitudes and behaviors towards pregnant women and childbirth.

5.4.2 Addressing Misconceptions about Health Facility Deliveries

Health education departments within health ministries or community health organizations should develop and implement community awareness programs to address misconceptions about health facility deliveries. Community leaders and influencers should actively support and participate in these awareness programs to ensure their effectiveness.

5.4.3 Further Studies to Monitor and Evaluate Model Impact

The county and national governments, other non-governmental funding agencies and research institutions should allocate resources for further studies to monitor and evaluate the impact of the developed model on the utilization of skilled delivery services. Research teams with expertise in public health and epidemiology should be involved in conducting these studies.

5.4.4 Government Policy Development and Implementation

Kenyan Health policy makers and government officials should collaborate to develop policies that facilitate the adoption and implementation of the various strategies outlined in the developed model. Legislative bodies should enact laws and regulations that support the implementation of these policies.

5.4.5 Conducting Larger Studies with Superior Methodological Design:

Academic institutions and research organizations should take the lead in designing and conducting larger studies with superior methodological designs such as randomized controlled trials (RCTs) or meta-analyses.

Collaboration with international research consortia or partnerships may be beneficial in conducting large-scale studies with sufficient statistical power and generalizability.

5.4.6 Regular Critics and Development of Comprehensive Models of Care:

Quality assurance departments within healthcare organizations at the national and county government levels should conduct regular critiques of available models of care to ensure their ongoing relevance and effectiveness. Multidisciplinary teams comprising healthcare professionals, researchers, policymakers, and community representatives should collaborate to develop comprehensive models of care that incorporate all strategies to improve the uptake of skilled deliveries in the study area.

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APPENDICES

Appendix I: Consent and Questionnaire Phase I (English Version)

CONSENT

Instructions:

Please read the following statements and sign the form as a symbol of the acceptance to participate in the study, if you agree with the contents.

My name is Daniel Muya, a student at the Jomo Kenyatta University of Agriculture and Technology (JKUAT). I am carrying out a STUDY in fulfillment for the award of Doctor of Philosophy Degree (PhD) in Nursing. The title of my study is **"A model to promote the utilization of skilled deliveries among women of reproductive age in Kandara Sub-County Murang'a County- Kenya"**. The purpose of the study is to develop a model of care to promote the utilization of skilled deliveries in the Sub-County and Murang'a County at Large

If you agree to take part in this study, you are requested to complete the attached questionnaire. The questionnaire includes a set of statements in relation to skilled delivery. The participation is purely on voluntary basis and you free to drop out of the study at any point without any victimization. The identity will be remained anonymous and it will be not be revealed at any stage of the study. Results of this study will be disseminated through various means including conference presentations and publishing in journals.

In case of any clarifications, feel free to contact you using the contact below.

Researcher's contact:

DANIEL MUYA Mobile No: 0721896314

Email: destiny.gachathi@gmail.com

I will highly appreciate if you spare some time from your busy schedule to fill in the questionnaire.

Study participants' declaration

Kindly tick (√) in the box against each of the following statements if you agree

I have read and understood the above statements regarding the study entitled "**Development of a model of care to promote the utilization of skilled deliveries in Kandara Sub-County- Murang'a County in Kenya**

” I do understand that I am free to ask any questions in case I need clarifications, using the contact provided ☐

I have been informed that my participation in the study is on voluntary basis and there will be no victimization in case I opt to drop out from the study at any point ☐

I understand that anonymity will be used throughout the study and all the information I will be avail will be only be used for the study purposes only ☐

I understand that the research findings can be disseminated through various means including publications in public journals ☐

I hereby authorize you to disseminate professionally the study findings through various academic means including publications. ☐

I freely and voluntarily agree to participate in this study. ☐

Study participants' signature……Date……

Researchers' signature……. Date……

INSTRUCTIONS

The information will be acquired is meant for study purpose

All information will be confidential

Do not write the name on this paper.

ELIGIBILITY QUESTIONS

What is the age in years? _____

How old is the child in months? _____

Where have you lived for the last one year? _____

How many children have you ever borne? (Both alive and dead) _____

Part 1 – Socio-Demographic Characteristics

Level of education

No formal education [ ]

Primary [ ]

Secondary [ ]

College [ ]

University **[ ]**

Marital status

Single [ ]

Married [ ]

Separated/divorced [ ]

Widowed [ ]

Religion

Christian [ ]

Muslim [ ]

Others (specify) _____

Part 2 -Knowledge on Safe Delivery

How old was the pregnancy when you first visited the ANC _____ months

How many visits did you make before you delivered the child _____ visits?

What is the recommended number of ANC visits _____visits?

Name any danger signs of pregnancy and child birth you know? (Do not read the answers)

Bleeding [ ]

High blood pressure [ ]

Obstructed labor [ ]

Sepsis [ ]

Others (Specify) _____

The statements presented below describe aspects of knowledge on safe delivery and choice of place of delivery for mothers seeking child welfare services. Please indicate the level of agreement to each of the statements by ticking '√' in the appropriate box (from 1 to 5); where: 1= Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

	Item	**SD 1**	**D 2**	**N 3**	**A 4**	**SA 5**
	Lack of information about skilled delivery services offered in hospitals has encouraged home delivery					
	I am aware that effective postnatal care helps reduce maternal and neonatal deaths					
	Knowledge on utilization of health facilities for labor and delivery services helps reduce maternal and neonatal deaths					

	I am aware of antenatal, delivery, post-partum and family planning services offered in hospitals and this makes me deliver in hospitals					
	Mothers are educated on the complications associated with pregnancy and child birth when they attend antenatal clinics					
	It is safer to deliver in a hospital than at home					

PART 3 - ATTITUDE TOWARDS HEALTH FACILITIES DELIVERY

Where did you deliver the last child?

Health facilities [ ]

Home [ ]

Others (Specify) _____

9a) if in the hospital name of the facility----------

9b) if you delivered at home will be it by choice or by circumstances----------

9c) If by circumstances, state what----------

9d) if by choice, explain the reason why you opted to deliver at home rather than at the health facility

If health facilities, how were you treated by the healthcare providers during delivery?

Very nicely [ ]

Nicely [ ]

Badly [ ]

Very badly [ ]

Others (Specify) _____

How would you describe the conduct of the health workers during the last delivery? (Multiple responses)

Positive, friendly and welcoming [ ]

Negative, unfriendly and unwelcoming [ ]

They were rude [ ]

They were un kind [ ]

Others (specify) _____

The statements presented below describe aspects of attitudes towards health facilities delivery and choice of place of delivery for mothers seeking child welfare services. Please indicate the level of agreement to each of the statements by ticking '√' in the appropriate box (from 1 to 5); where: 1= Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly Agree (SA)

	Item	**SD 1**	**D 2**	**N 3**	**A 4**	**SA 5**
	Poor delivery environment lack of privacy discourages women from delivering in health facilities					
	Lack of satisfaction with service delivery encourages women to deliver at home					
	Harsh settings in hospitals encourages delivery at home					
	Lack of respect for cultural beliefs encourages delivery at home					

Part iv- strategies that can enhance the utilization of the skilled deliveries

List any strategies that can help in increasing the utilization of skilled delivery in this Sub-County

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Appendix II: Consent and Questionnaire –Phase I (Kikuyu Version)

Witikiri

Mawatho:

Itikira guthoma mohoro maria mandikitwo haha na wikire kirore giakuonania ati niwetikira kuheana mohoro maria ungiurio iguru ria uthuthuria uria urathii na mbere. Riitwa riakwa ni Daniel Muya nandi murutwo thukuruini ya Jomo Kenyatta University of Agriculture and Technology (JKUAT). Ndireka uthuthuria nigetha heyo thumbi ya PhD ya urigitani.

Ritwa ria uthuthuria ucio ni ”M**aundu maria mangiteithiriria kuongerereka kwa atumia aria aritu kuheo ciana magiteithiriirio ni arigitani akinyaniru thiini wa subcounty ya Kandara, Murang'a county**”

Mworoto wa uthuthuthuria uyu ni gucharia njira iria ingihotithia atumia aria maraheo ciana a Kandara Sub-county guteithiririo ni arigitani akinyaniru uhoroini wa uciari. Wetikira kunyitanira na muthuthuria, niukurio na gitio ucokie ciuria iria iri bomu ini ino na njira ya uuma. Ciuria iria ciuritio haha ni iria ihutantie na uhoro wa uciari uria uteithiririo ni arigitani akinyaniru. Unyitaniri waku ti wa kuringiririo na no urege, kana utigane na uthuthuria uyu hindi oyothe hatari na hathara o yothe ingigukora niundu wa uregani waku. Maundu maria moothe ungiuga kana wandike bomuini ino ona ritwa riaku nimekuhithirirwo na gutiri mundu ona uriku ungimenyithio maundu macio. Maumirira ma uthuthuria uyu nimagacoka maanirirwo guku kuri inyui na macoke mandikwo mabukuini ma guthomwo ni muingi.

Ungikorwo na undu ungienda kumenya makiria kana kiuria ona kiriku, no ukinyirie muthuthuria Daniel muya na namba ya thimu 0721896314 kana njira ya ruhuho na destiny.gachathi@gmail.com

Ningucokia ngatho ungitikira kwirutira ndagika ciaku nyinyi gucokia ciuria ici

Ngirimiti ya witikiri

Ikira tiki (√) gathandukuini karia ke muicoini wa kiuria

Nii nindathoma na ndamenya maundu maria moothe mandikitwo ngirimiti-ini ino ya uthuthuria uyu wa gucharia njira cia guteithiriria atumia aria maraheo ciana a Kandara Sub-County- Murang'a county Kenya guteithiririo nia arigitani mena umenyo wa uciari.

Nindamenyithio at ndina wiyathi wa kuria kiuria o giothe ingikorwo ndi nakio ngitumira njira iria ndaheyo ☐

Nindamenya ati witikiri wakwa ti wa kuringiririo na no ndieherie ihinda o riothe itinaini o riothe ria uthuthuria uyu itari na ugwati o wothe ungingora thuthaini ucio ☐

Nindamenyithio ati maundu maria moothe ingihena kana nyandike bomuini ino nimekumenyererwo na ati riitwa riakwa ritikaumburwo itinaini o riothe ria uthuthuria uyu ☐

Nindamenyithio ati riboti ya maumirira ma uthuthuria uyu ni ikandikwo mabukuini maria marithomagwo ni muingi wothe ☐

Nii nindaheana rutha kuri muthuthuria ati noandikithie riboti ino mabukuini maguthomagwo ni muingi akirumirira mutaratara uria wagiriire. ☐

Ninderutira itaringiriirio ni mundu ona uriku kuheana uhoro uthuthuriani uyu ☐

Kirore giakwa---------- tariki----------

kirore kia muthuthuria---------- tariki ----------

Ciuria

<u>Mawatho:</u>

<u>Bata wa mohoro ma uthuthuria uyu ni wa githomo</u>

<u>Maundu maria mekwandikwo haha ni mekumenyererwo na matikuheanwo kuri andu aria matagiririwo</u>

<u>Ndukandike riitwa riaku bomu-ini ino</u>

<u>Ciuria cia uigiririku</u>

Wina ukuru wa miaka iigana ? _____

Mwana waku uria munini ena ukuru wa mieri iigana ? _____

Ukoretwo ugiikra ku hari mwaka ucio urikitie guthira ? _____

wina ciana cigana (nginya iria itari muoyo) _____

<u>Part 1 maundu ma muikarire na kimuciie</u>

Muigana wa githomo

Nduri waingira cukuru [ ]

Primary [ ]

Thekondari [ ]

kolligi [ ]

unibasiti [ ]

Kihiko

ndihikite [ ]

Ndimuhiku [ ]

nitwatiganire [ ]

Ndi wa ndigwa [ ]

Witikio

mukiristo [ ]

muithiramu [ ]

ungi (thathaura)_____

Part 2 - umenyo wa uciari mumenyerere

Wanjiriirie kiliniki ya atumia aritu nda yaku ina mieri iigana?----------

Wathiire kiliniki cia atumia aritu cigana utanaheo mwana?----------

Mutumia muritu agiriirwo ni guthii kiliniki cigana atanaheo mwana?----------

) gweta mogwati maria mangikora atumia aritu riria moha nda kinya rira makaheo ciana

Kuura [ ]

Gutengera thakame [ ]

Mwana kuregera mahindiini [ ]

bacteria kuingira thakameini [ ]

Undu ungi (thathaura makiria) _____

Ikira **Tiki '√'** gathandukukuini witikaniri waku na mohoro maria mandikitwo kiuriani giki;

1=nindaregana biubiu na uhro ucio

2= nindaregana na uhoro ucio

3= ndiri na ma na uhoro ucio

4= nindetikaniria na uhoro ucio

5= nindetikaniria biu biu na uhoro ucio

	Uhoro	**1**	**2**	**3**	**4**	**5**

	Kwaga umenyo wa uciari mumenyerere ni arigitai mena umenyo ni gutumaga atumia aingi maherwo ciana miciini					
	ninjui ati umenyereri wa mutumia arikia kuheo mwana ni kugiragiriria ikuu nyingi muno cia atumia na ciana cia ngenge					
	Kuherwo mwana thibitariini ni kugiragiriria ikuu nyingi cia twana twa ngenge na manyina matuo					
	Nii ninjui ati guthii kilinki cia atumia aritu,kurorwo wega ni arigitani mutumia aheo mwana , ana ubangi wa bamily ni kumenyagirira ugima mwega wa mwiri wa mutumia na nikio nii heyagiruo ciana ciakwa thibitari					
	Atumia aritu nimathomithagio mogwati maria mangikorana na mutumia hindi ira ohete nda na riria araheo mwana riria mathii cliniki ya atumia aritu					
	Kuherwo mwana thibitari nikugiragiriria ikuu nyingi gukira kuherwo mwana mucii					

Part 3 - attitude towards health facilities delivery

Wahererirwo ku kana gaku ka muico?

Thibitari [ ]

muciii [ ]

Kundu kungi (thathaura makiria) _____

9a) Ritwa ria thibitari----------

9b Angikorwo wahererirwo mucii heana gitumi iria cia tumire----------

9c) Angikorwo ndwari mubango waku wa kuherwo mucii ni itumi iriku ciatumire? -

---

9d) Angikorwo niwari mubango waku wa kuherwo mucii heana itumi iria ciatumire uthure mucii handu ha thibitari

Angikorwo wahereiruo ciana thibitarini ri, arigitani makuheire utungata na njira iriku?

Wega muno [ ]

Wega [ ]

uru [ ]

Uru muno [ ]

Undu ungi (thathaura makiria) _____

Heana uria wonire mitugo ya arigitani

Arata,na wendo muingi[ ]

Uuru muingi [ ]

kurumana [ ]

matiateithagia arwaru [ ]

Undu ungi(thathaura makiria) _____

_____

Ikira tiki '√' gathandukukuini witikaniri waku na mohoro maria mandikitwo kiuriani giki ;

1= nindaregana biubiu na uhro ucio

2= nindaregana na uhoro ucio

3= ndiri na ma na uhoro ucio

4= nindetikaniria na uhoro ucio

5= nindetikaniria biu biu na uhoro ucio

	Uhoro	**Sd 1**	**D 2**	**N 3**	**A 4**	**Sa 5**
	Miikarire itari miega na kwaga thoni ni gutumaga atumia aingi marge guthi kuherwo ciana thibitariini					
	Kuiganira na motungata maria maheanagwo mathibitariiini hindi ya kuheo mwana ni gutumaga atumia aingi maherwo ciana miciini					
	Miikarire mirtu ya mathibitari nitumaga atumia aingi maherwo ciana miciini					
	Arigitani aingi matirumagirira mitugo na unduire wa atumia aingi kwogo atumia aingi nimaregaga guthii kuherrwo ciana thibitari					

Part iv- nJira cia gutuma atumia metikitire guthi kuherwo ciana thibitari

Andika njira cioothe iria ingeteithiriria kuongerereka kwa atumia guthii kuherwo ciana thibitari kuria kwina arigitani mena umenyo

---

Appendix III: Consent and Questionnaire for Phase I (Kiswahili Version)

Fomu Ya Majali

Maagizo:

Tafadhali soma taarifa zifuatazo kisha , ikiwa unakubaliana na yaliyomo weka saini katika fomu hii kama ishara ya kukubalika kwako kushiriki katika utafiti.

Jina langu ni Daniel Muya, mwanafunzi wa Chuo Kikuu cha Kilimo na Teknolojia cha Jomo Kenyatta (JKUAT) katika shule ya sayansi ya afya. Ninafanya utafiti wa kutimiza kutunzwa na Shahada ya Daktari wa Falsafa (PhD) katika uzazi na magonjwa ya wanawake. Mada ya utafiti wangu ni "Mtindo utunzanji wa kukuza utumiaji wa ustadi wa kujifungua kati ya wanawake wa umri wa kuzaa katika kaunti ndogo ya Kandara, Kaunti ya Murang'a nchini Kenya". Kusudi la utafiti huo ni kukuza mtindo wa utunzaji kukuza utumiaji wa uzazi wenye ujuzi katika Kaunti Ndogo ya Kandara na Kaunti ya Murang'a kwa jumla.

Ikiwa unakubali kushiriki katika utafiti huu, unaombwa kukamilisha hojaji iliyoambatishwa. Hojaji inajumuisha seti ya taarifa kuhusiana na utoaji wenye ujuzi. Ushiriki wako uko kwa hiari tu na uko huru kuacha kushiriki katika utafiti huu wakati wowote bila udhalilishaji wowote. Utambulisho wako utabaki bila kujulikana na hautafunuliwa katika hatua yoyote ya utafiti. Matokeo ya utafiti huu yatasambazwa kupitia njia anuwai pamoja na mawasiliano ya mkutano na kuchapisha kwenye majarida.

Ikiwa kuna ufafanuzi wowote, jisikie kuwasiliana na mtafiti kwa kutumia mawill beiliano hapa chini.

Mawill beiliano ya Mtafiti:

DANIEL MUYA

Nambari ya simu: 0721896314

Barua pepe: destiny.gachathi@gmail.com

Nitashukuru sana ikiwa utaepuka muda kutoka kwa ratiba yako yenye shughuli kujaza dodoso ifuatayo

Tamko la makubaliano

Tia alama (√) kwenye kisanduku dhidi ya kila moja ya taarifa zifuatazo ikiwa unakubaliana

Nimesoma na kuelewa matamko hapo juu kuhusu utafiti ulioitwa "Ukuzaji wa mtindo wa utunzaji kukuza utumiaji wa uzazi wenye ujuzi katika kaunti ndogo ya Kandara-kaunti ya Murang'a nchini Kenya ☐

Ninaelewa kuwa niko huru kuuliza maswali yoyote ikiwa nitahitaji ufafanuzi, kwa kutumia mawasiliano yaliyotolewa ☐

Nimearifiwa kuwa ushiriki wangu katika utafiti ni wa hiari na hakutakuwa na unyanyasaji endapo nitachagua kuacha kushiriki katika utafiti wakati wowote ☐

Ninaelewa kuwa kutokujulikana kutatumika wakati wote wa utafiti na habari zote nitakazo peana zitatumika tu kwa madhumuni kitaalamu tu ☐

Ninaelewa kuwa matokeo ya utafiti yanaweza kusambazwa kupitia njia anuwai pamoja na machapisho katika majarida ya umma ☐

Ninampa mamlaka mtafiti kusambaza kitaalam matokeo ya utafiti kupitia njia anuwai za kitaaluma pamoja na machapisho . ☐

Ninakubali kwa hiari kushiriki katika utafiti huu . ☐

Saini ya mshiriki wa utafiti …… .. Tarehe ……

Saini ya msaidizi wa utafiti …… .. Tarehe ……

DODOSO

MASWALI

MAELEKEZO:

a) Habari itakayo kusanywa itatumika tu kusudi la kitaaluma

b) Taarifa zote zitakuwa za siri

c) Usiandike jina lako kwenye karatasi hii.

MASWALI YA KUFAULU

i. Je! Una umri gani katika miaka? _____

ii. Mtoto wako ana umri gani katika miezi? _____

iii. Umeishi wapi kwa mwaka mmoja uliopita? _____

iv. Je! Umewahi kuzaa watoto wangapi? (Wote walio hai na waliokufa)

_____

Sehemu ya 1 - Tabia za Jamii na Idadi ya Watu

Kiwango cha elimu

Hakuna elimu rasmi [ ]

Sekondari [ ]

Chuo [ ]

Chuo Kikuu [ ]

2. Hali ya ndoa

Mseja [ ]

Walioa [ ]

Wameachana [ ]

Mjane [ ]

3. Dini

Mkristo [ ]

Mwislamu [ ]

Wengine (taja) _____

Sehemu ya 2 -Kujua juu ya mchakato salama wa kunjifungua

Mimba yako ilikuwa na umri gani wakati ulipotembelea ANC miezi _____ ya kwanza

Ulifanya ziara ngapi kabla ya kumzaa mtoto wako _____

Je! Ni idadi gani inayopendekezwa ya ziara za ANC _____zitembezi

Taja dalili zozote za hatari za ujauzito na kuzaliwa kwa mtoto unajua? (usisome majibu)

Vujadamu [ ]

Shinikizo la damu [ ]

Kazi iliyozuiliwa [ ]

Sepsis [ ]

Wengine (Bainisha) _____

Kauli zilizo elezewa hapo chini zinaelezea mambo ya maarifa juu ya kujifungua salama na chaguo la mahali pa kujifungulia kwa akina mama wanaotafuta huduma za ustawi wa watoto. Tafadhali onyesha kiwango chako cha makubaliano kwa kila taarifa kwa kuweka alama ya ‘katika sanduku linalofaa (kutoka 1 hadi 5); wapi: 1 = Kutokubaliana Sana ; 2 = Kutokubaliana ; 3 = Kutokuwamo ; 4 = Kukubaliana ; 5 = Kubali Sana

Bidhaa	Kiwango cha makubaliano				
	1	2	3	4	5
i. Ukosefu wa habari kuhusu huduma za utoaji wenye ujuzi zinazotolewa katika hospitali imehimiza utoaji wa nyumba					
ii. Ninajua kuwa utunzaji mzuri baada ya kuzaa husaidia kupunguza vifo vya akina mama na watoto wachanga					
iii. Maarifa juu ya matumizi ya vituo vya afya kwa huduma za leba na kujifungua husaidia kupunguza vifo vya akina mama na watoto wachanga					
iv. Ninajua juu ya huduma za uzazi kabla ya kujifungua, kujifungua, baada ya kujifungua na uzazi wa mpango zinazotolewa hospitalini na hii inanifanya nitoe katika hospitali					
v. Akina mama wameelimishwa juu ya shida zinazohusiana na ujauzito na kuzaliwa kwa watoto wakati wanapohudhuria kliniki za ujauzito					
vi. Ni salama kujifungua hospitalini kuliko nyumbani					

SEHEMU YA 3 - MTAZAMO KUELEKEA UFUGAJI WA VIFAA VYA AFYA

Ulinjifingulia wapi mtoto wako wa mwisho?

kiituo cha afya [ ]

Nyumbani [ ]

pengineko (Taja) _____

Ikiwa katika hospitali taja jina la kituo ---------- -

Ikiwa ulijifungua nyumbani, ilikuwa kwa hiari au kwa hali? ----------

Ikiwa kwa hali, peana sababu---------- ----------

ikiwa kwa hiari, eleza sababu ya kwanini ulichagua kujifungulia nyumbani badala ya kituo cha afya----------

. Ikiwa vituo vya afya, ulitibiwa vipi na watoa huduma za afya wakati wa kujifungua?

Nzuri sana [ ]

Vizuri [ ]

Mbaya [ ]

Mbaya sana [ ]

Wengine (Bainisha) _____

Je! Unaweza kuelezeaje mwenendo wa wahudumu wa afya wakati wa kujifungua kwako kwa mwisho? (Majibu mengi)

Chanya, kirafiki na kukaribisha [ ]

Hasi, isiyo rafiki na isiyokubalika [ ]

Walikuwa wakorofi [ ]

Walikuwa will beio na fadhili [ ]

Wengine (taja) _____

Kauli zilizowill beilishwa hapa chini zinaelezea hali ya mitazamo kuelekea utoaji wa vituo vya afya na chaguo la kujifungulia kwa akina mama wanaotafuta huduma za ustawi wa watoto. Tafadhali onyesha kiwango chako cha makubaliano kwa kila taarifa kwa kuweka alama ya ‘katika sanduku linalofaa (kutoka 1 hadi 5); wapi: 1 = Kutokubaliana Sana (SD); 2 = Kutokubaliana (D); 3 = Kutokuwamo (N); 4 = Kukubaliana (A); 5 = Kubali Sana (SA)

Bidhaa	Kiwango cha makubaliano				
	1	2	3	4	5
i. Mazingira duni ya kujifungulia na ukosefu wa faragha huwavunja moyo wanawake kujifungua katika vituo vya afya					
ii. Ukosefu wa kuridhika na utoaji wa huduma huwahimiza wanawake kujifungulia nyumbani					
iii. Mipangilio ya ukali katika hospitali inahimiza kujifungua nyumbani					
iv. Ukosefu wa heshima kwa imani za kitamaduni unahimiza utoaji nyumbani					
Sehemu ya iv- mikakati ambayo inaweza kuongeza matumizi ya uwill beilishaji wenye ujuzi					

Orodhesha mikakati yoyote inayoweza kusaidia katika kuongeza matumizi ya uwill beilishaji wenye ujuzi katika kaunti hii ndogo

i. ---------- -------

ii. ---------- ------

iii. ---------- ------

iv. ---------- ------

Appendix IV: Key Informant Interview (KII)

A model to enhance skilled delivery among women of reproductive age in Kandara Sub-County; Murang'a County

In the opinion what factors hinder the uptake of skilled delivery among women of reproductive age in Kandara Sub-County?

What would you comment regarding the contribution of knowledge on safe delivery the on utilization of skilled delivery among mothers in Kandara Sub-County?

How would you describe the mothers' attitude toward facility based/skilled delivery?

What is the understanding of skilled delivery service provided in health facilities?

In the opinion what are reasons would you give that hinders pregnant women from use skilled delivery services?

What are the benefits of skilled delivery services for women?

In the opinion how would you describe the mothers' attitude towards health facility delivery in Kandara Sub-County?

list the strategies you feel that if implemented can enhance the utilization of skilled deliveries among the women of reproductive age in Kandara Sub-County

---

Appendix V: Focus Group Discussion Guide for Women

I. Participant Demographic Intake Sheet Form for Focus Group Interview

Participant demographic intake sheet: This form should be filled before the FGD					
Participant code ------	____	_____	_____	_____	_____
Age ----------					
Religion ----------					
Marital status ----------					
Are you employed? (Yes/No) ----------					
Educational level ----------					
Gravidity ----------					
Parity ----------					
Place of delivery in last pregnancy ----------					

Name of THE WARD: _____

Name of CU: _____

Name of the interviewer: _____

Date of discussion: _____

Start time: ____: _____ Adjourned: _____: _____

NB: One question will be asked at a time until the interviewer is satisfied by the saturation of the information given

Interview guide

Explain the factors that influence women to utilize skilled delivery services in the Sub-County?

How do you rate the quality of care received by the pregnant mothers from the skilled delivery services in the Sub-County?

Explain factors that would motivate pregnant mothers to utilize skilled delivery service during future pregnancies in the Sub-County

Explain the support the women receive from the community during child birth to utilize skilled delivery service?

In the opinions what strategies do you think if developed and implemented could help in improving maternal health care and uptake of skilled deliveries in the community?

Appendix VI: Consent and Questionnaire Phase II (English Version)

CONSENT

Instructions:

Please read the following statements and sign the form as a symbol of the acceptance to participate in the study, if you agree with the contents.

My name is Daniel Muya, a student at the Jomo Kenyatta University of Agriculture and Technology (JKUAT). I am carrying out a STUDY in fulfillment for the award of Doctor of Philosophy Degree (PhD) in Nursing. The title of my study is **"A model to promote the utilization of skilled delivery among women of reproductive age in Kandara Sub countryman's County- Kenya"**. The purpose of the study is to develop a model of care to promote the utilization of skilled deliveries in the Sub-County and Murang'a County at Large

If you agree to take part in this study, you requested to complete the attached questionnaire. The questionnaire includes a set of statements in relation to skilled delivery. The participation is purely on voluntary basis and you free to drop out of the study at any point without any victimization. The identity will be remained anonymous and it will be not be revealed at any stage of the study. Results of this study will be disseminated through various means including conference presentations and publishing in journals.

In case of any clarifications, feel free to contact you using the contact below.

Researcher's contact:

DANIEL MUYA Mobile No: 0721896314

Email: destiny.gachathi@gmail.com

I will be highly appreciated if you will spare some time from the busy schedule to fill in the questionnaire.

Study participants' declaration

Kindly tick (√) in the box against each of the following statements if you in agreement

I have read and understood the above statements regarding the study entitled

"**Development of a model of care to promote the utilization of skilled deliveries in Kandara Sub-County- Murang'a County in Kenya**

” I do understand that I am free to ask any questions in case I need clarifications, using the contact provided

I have been informed that my participation in the study is on voluntary basis and there will be no victimization in case I opt to drop out from the study at any point ☐

I understand that anonymity will be used throughout the study and all the information I will be avail will be only be used for the study purposes only ☐

I understand that the research findings can be disseminated through various means including publications in public journals ☐

I hereby authorize you to disseminate professionally the study findings through various academic means including publications. ☐

I freely and voluntarily agree to participate in this study. ☐

Study participants' signature…….

Date……

Research assistant' signature…….

Date……

QUESTIONNAIRE

INSTRUCTIONS

The information will be acquired is meant for study purpose

All information is confidential

Do not write your name on this paper.

PART 1- PLACE OF DELIVERY

1. Where did you deliver your last child?
   I. Health facilities [ ]
   II. Home [ ]
   III. Others (Specify)
   _____
2. if in the hospital name of the facility----------
3. if you delivered at home will be it by choice or by circumstances----------
4. If by circumstances, state what----------
5. if by choice, explain the reason why you opted to deliver at home rather than at the health facility

PART II: TRAINING /SENSITIZATION

1. Did you receive any training/sensitization during your pregnancy? Yes …. No …… (if no, skip to question 1

A. If yes, do you think the training/sensitization session added any new knowledge on pregnancy and delivery to you?

B. Did the training/sensitization influence the choice to deliver in a health facility? Yes …… No. …..

2. Where did you receive the training/sensitization sessions?

I. At the community

II. At the health facility

III. Both community and health facility

IV. Others (specify) ……

What is the opinion on such sensitization program for pregnant women? ----------

---

Appendix VII: Consent and Questionnaire for Phase II (Kikuyu Version)

WITIKIRI

Mawatho:

Itikira guthoma mohoro maria mandikitwo haha na wikire kirore giakuonania ati niwetikira kuheana mohoro maria ungiurio iguru ria uthuthuria uria urathii na mbere. Riitwa riakwa ni Daniel Muya nandi murutwo thukuruini wa Jomo Kenyatta University of Agriculture and Technology (JKUAT). Ndireka uthuthuria nigetha heyo thumbi ya PhD ya urigitani wa atumia.

Ritwa ria uthuthuria ucio ni "**maundu maria mangiteithia kuongerereka kwa atumia aria maraheo ciana kuheo ciana magiteithiririo ni arigitani akinyaniru thiini wa Sub-County ya kandara, Murang'a county**"

Mworoto wa uthuthuthuria uyu ni gucharia njira iria ingihotithia atumia aria maraheo ciana a Kandara Sub-County guteithiririo ni arigitani akinyaniru uhoroini wa uciari. Wetikira kunyitanira na muthuthuria , niukurio na gitio ucokie ciuria iria iri bomu ini ino na njira ya uma. Ciuria iria ciuritio haha ni iria ihutanitie na uhoro wa uciari uria uteithiririo ni arigitani akinyaniru. Unyitaniri waku ti wa kuringiririo na no urege, kana utigane na uthuthuria uyu hindi oyothe hatari na hathara o yothe ingigukora niundu wa uregani waku. Maundu maria moothe ungiuga kana wandike bomuini ino ona ritwa riaku nimekuhithirirwo na gutiri mundu ona uriku ungimenyithio maundu macio. Maumirira ma uthuthuria uyu nimagacoka maanirirwo guku kuri inyui na macoke mandikwo mabukuini ma guthomwo ni muingi.

Ungikorwo na undu ungienda kumenya makiria kana kiuria ona kiriku, no ukinyirie muthuthuria Daniel Muya na namba ya thimu 0721896314 kana njira ya ruhuho na destiny.gachathi@gmail.com

Ningucokia ngatho ungitikira kwirutira ndagika ciaku nyinyi gucokia ciuria ici

Ngirimiti ya witikiri

Ikira tiki (√) gathandukuini karia ke muicoini wa kiuria

Nii nindathoma na ndamenya maundu maria moothe mandikitwo ngirimiti-ini ino ya uthuthuria uyu wa gucharia njira cia guteithiriria atumia aria maraheo ciana a Kandara Sub-County- Murang'a county Kenya guteithiririo nia arigitani mena umenyo wa uciari. ☐

nindamenyithio at ndina wiyathi wa Kuria kiuria o giothe ingikorwo ndi nakio ngitumira njira iria ndaheyo ☐

nindamenya ati witikiri wakwa ti wa kuringiririo na no ndieherie ihinda o riothe itinaini o riothe ria uthuthuria uyu itari na ugwati o wothe ungingora thuthaini uc ☐

nindamenyithio ati maundu maria moothe ingihena kana nyandike bomuini ino nimekumenyererwo na ati riitwa riakwa ritikaumburwo itinaini o riothe ria uthuthuria uyu ☐

nindamenyithio ati riboti ya maumirira ma uthuthuria uyu ni ikandikwo mabukuini maria marithomagwo ni muingi wothe ☐

nii nindaheana rutha kuri muthuthuria ati noandikithie riboti ino mabukuini maguthomagwo ni muingi akirumirira mutaratara uria wagiriire. ☐

ninderutira itaringiriirio ni mundu ona uriku kuheana uhoro uthuthuriani uyu ☐

Kirore giakwa---------- tariki----------

kirore kia muthuthuria---------- **tariki** ----------

Part 1 – KURIA MUTUMIA AHEREIRWO MWANA

Wahererirwo ku kana gaku ka muico?

Thibitari [ ]

Muciii [ ]

Kundu kungi (thathaura makiria) _____

Ritwa ria thibitari----------

Angikorwo wahererirwo mucii heana itumi iria cia tumire----------

Angikorwo ndwari mubango waku wa kuherwo mucii ni itumi iriku ciatumire?----------

Angikorwo niwari mubango waku wa kuherwo mucii heana itumi iria ciatumire uthure mucii handu ha thibitari

PART 11- GITHOMO KIA UCIARI

niwathomithirio uhoro wa kuheerwo mwana thibitariini hindi ya kiliniki ya atumia aritu? Wakorwo nuathomithirio uthie kiuria number 13

wakorwo ni wathomithiriori niurona ta githomo kiu giaguteithirie uhoroini wa uciari?

Githomo kiu wathomithirio niurona ta kia gwatire itemi ituaini ria kuhererwo mwan thibitariiini?

githomo kiu wathomeire ku? { }

Ituraini { }

Thibitariini { }

ituraini na thibitariini { }

kundu kungi (thathura) ……

ungiuga atia iguru ria githomo ta kiu hari atumia aritu? ----------

---

Appendix VIII: Consent & Questionnaire for Phase two (Kiswahili Version)

FOMU YA MAJALI

MAAGIZO:

Tafadhali soma taarifa zifuatazo kisha weka saini katika fomu hii kama ishara ya kukubalika kwako kushiriki katika utafiti, ikiwa unakubaliana na yaliyomo.

Jina langu ni Daniel Muya, mwanafunzi wa Chuo Kikuu cha Kilimo na Teknolojia cha Jomo Kenyatta (JKUAT) katika shule ya sayansi ya afya. Ninafanya utafiti wa kutimiza kutunzwa na Shahada ya Daktari wa Falsafa (PhD) katika uzazi na magonjwa ya wanawake. Mada ya utafiti wangu ni "Mtindo utunzanji wa kukuza utumiaji wa ustadi wa kujifungua mwenye ujuzi kati ya wanawake wa umri wa kuzaa katika kaunti ndogo ya Kandara, Kaunti ya Murang'a nchini Kenya". Kusudi la utafiti huo ni kukuza mtindo wa utunzaji kukuza utumiaji wa uzazi wenye ujuzi katika Kaunti Ndogo ya Kandara na Kaunti ya Murang'a kwa jumla.

Ikiwa unakubali kushiriki katika utafiti huu, unaombwa kukamilisha hojaji iliyoambatishwa. Hojaji inajumuisha seti ya taarifa kuhusiana na uzazi wenye ujuzi. Ushiriki wako uko kwa hiari tu na uko huru kuacha kushiriki katika utafiti huu wakati wowote bila udhalilishaji wowote. Utambulisho wako utabaki bila kujulikana na hautafunuliwa katika kipengele chochote cha utafiti huu. Matokeo ya utafiti huu yatasambazwa kupitia njia anuwai pamoja na mawill beilisho ya mkutano na kuchapisha kwenye majarida.

Ikiwa ungetaka ufafanuzi wowote, uko huru kuwill beiliana na mtafiti kwa kutumia mawill beiliano iliyo hapa chini.

Mawill beiliano ya Mtafiti:

DANIEL MUYA

Nambari ya simu: 0721896314

Barua pepe: destiny.gachathi@gmail.com

Nitashukuru sana ikiwa utaepuka muda kutoka kwa ratiba yako yenye shughuli kujaza dodoso ifuatayo

Tamko la will behiriki

Tia alama (√) kwenye kisanduku dhidi ya kila moja ya taarifa zifuatazo ikiwa unakubaliana

Nimesoma na kuelewa matamko hapo juu kuhusu utafiti ulioitwa "Ukuzaji wa mtindo wa utunzaji kukuza utumiaji wa uwill beilishaji wenye ujuzi katika kaunti ndogo ya Kandara- kaunti ya Murang'a nchini Kenya"Ninaelewa kuwa niko huru kuuliza maswali yoyote ikiwa nitahitaji ufafanuzi, kwa kutumia mawill beiliano yaliyotolewa ☐

Nimearifiwa kuwa ushiriki wangu katika utafiti ni wa hiari na hakutakuwa na unyanyasaji endapo nitachagua kuacha kushiriki katika utafiti wakati wowote ☐

Ninaelewa kuwa kutokujulikana kutatumika wakati wote wa utafiti na habari zote nitakazotumia zitatumika tu kwa madhumuni ya utafiti tu ☐

Ninaelewa kuwa matokeo ya utafiti yanaweza kusambazwa kupitia njia anuwai pamoja na machapisho katika majarida ya umma ☐

Ninampa mamlaka mtafiti kusambaza kitaalam matokeo ya utafiti kupitia njia anuwai za kitaaluma pamoja na machapisho ☐

Ninakubali kwa hiari kushiriki katika utafiti huu. ☐

Saini ya will behiriki wa utafiti …… .. Tarehe ……

Saini ya msaidizi wa utafiti …… .. Tarehe ……

DODOSO

MASWALI

MAELEKEZO

d) *Habari inayopatikana inapaswa kusudi la kusoma*

e) Taarifa zote zitakuwa za siri

f) Usiandike jina lako kwenye karatasi hii.

SEHEMU YA 1 – MAHARI YA KUNJIFUNGULIA

Ulinjifungulia wapi mtoto wako wa mwisho?

kiituo cha afya [ ]

Nyumbani [ ]

Wengine (Taja) _____

ikiwa katika jina la hospitali ya kituo ---------- -

ikiwa umefikisha nyumbani je, ni kwa hiari au kwa hali ----------

Ikiwa kwa hali, sema nini ---------- ----------

ikiwa kwa hiari, eleza sababu kwanini umechagua kujifungulia nyumbani badala ya kituo cha afya----------

SEHEMU YA II- MAFUNZO YA UZAZI

Je! Ulipata mafunzo / uhamasishaji wowote wakati wa uja uzito? Ndio…. Hapana …… (ikiwa hapana, ruka hadi swali la 13)

Ikiwa ndio, unadhani kikao cha mafunzo / uhamasishaji kiliongeza ujuzi wowote mpya juu ya ujauzito na kujifungua kwako

Je! Mafunzo / uhamasishaji uliathiri uchaguzi wako wa kujifungua katika kituo cha afya? Ndio /la. …..

Ulipata wapi vikao vya mafunzo / uhamasishaji?

Kwenye jamii .....

Katika kituo cha afya.....

Jamii na kituo cha afya.....

Wengine (taja) …….....

Appendix IX: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **303892**

Date of Issue: **06/January/2022**

RESEARCH LICENSE

This is to Certify that Mr.. DANIEL MUYA GACHATHI of Jomo Kenyatta University of Agriculture and Technology, has been licensed to conduct research in Muranga on the topic: A MODEL TO PROMOTE UTILIZATION OF SKILLED DELIVERIES AMONG WOMEN OF REPRODUCTIVE AGE IN KANDARA SUB-COUNTY, MURANG'A COUNTY- KENYA for the period ending : 06/January/2023.

License No: **NACOSTI/P/22/14856**

303892

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix X: JKUAT Ethics Clearance Letter

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
P.O BOX 62000(00200) NAIROBI, Tel:(067) 58700001-4
(Office of the Deputy Vice Chancellor, Research Production and Extension Division)

JKUAT INSTITUTIONAL ETHICS REVIEW COMMITTEE

REF: JKU/2/4/8968 Date: 18th November 2021

DANIEL MUYA
SCHOOL OF NURSING, JKUAT

Dear Mr Muya,

RE: A MODEL TO PROMOTE UTILIZATION OF SKILLED DELIVERIES AMONG WOMEN OF REPRODUCTIVE AGE IN KANDARA SUB- COUNTY, MURANG'A COUNTY- KENYA

This is to inform you that JKUAT Institutional Ethics Review Committee has reviewed and approved your above research proposal. Your application approval number is **JKU/IERC/02316/0431.** The approval period is **18th November 2021** to **17th November 2022**.

This approval is subject to compliance with the following requirements;

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

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

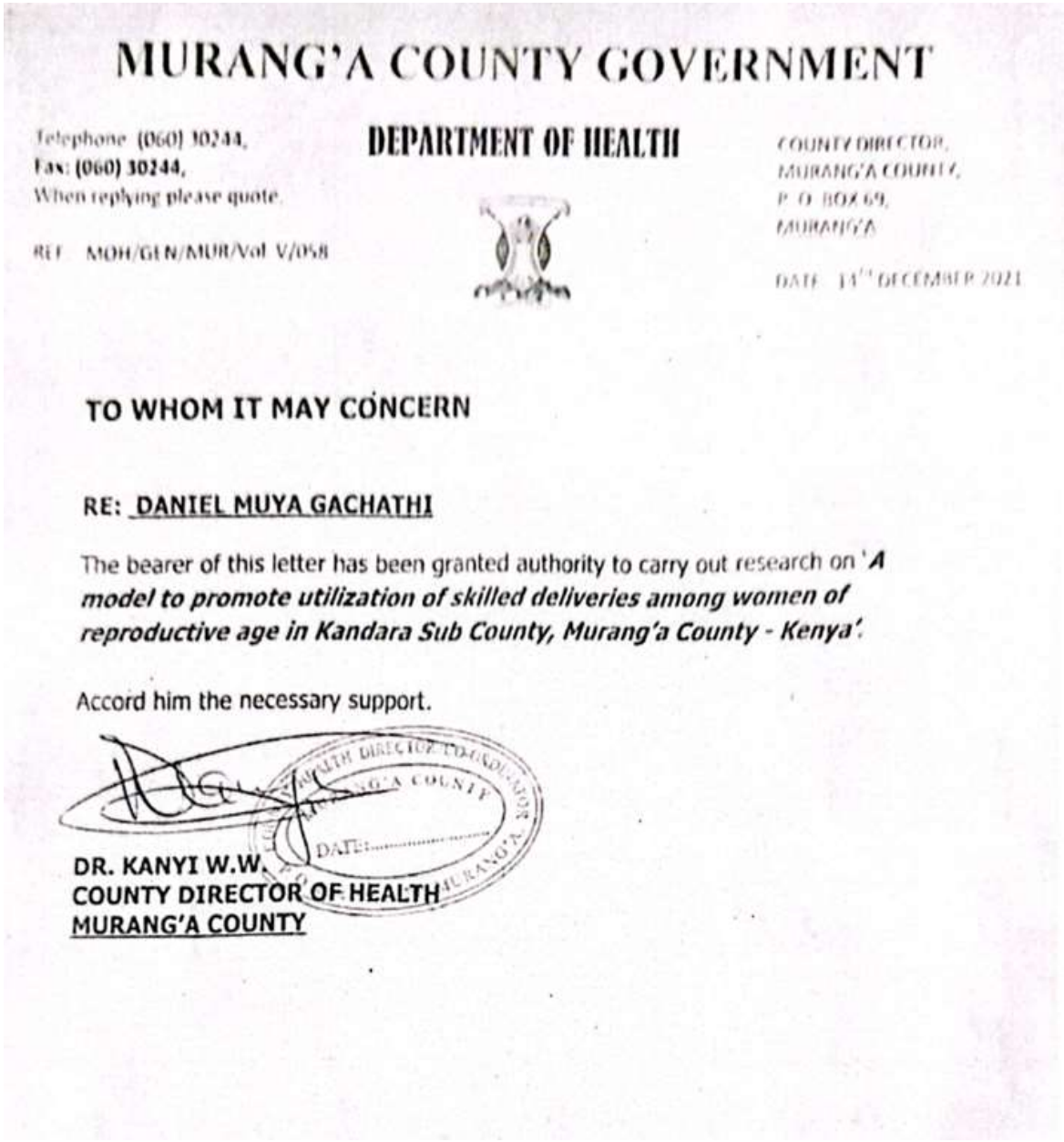
Yours sincerely

Dr Patrick Mburugu
Chair, JKUAT IERC

INSTITUTIONAL ETHICS REVIEW COMMITTEE
18 NOV 2021
APPROVED
P.O. Box 62000-00200 NAIROBI
www.jkuat.ac.ke
JKUAT

JKUAT is ISO 9001:2015 and ISO 14001:2015 certified
Setting Trends in Higher Education, Research, Innovation and Entrepreneurship

Appendix XI: Murang'a County Approval Letter



MURANG'A COUNTY GOVERNMENT

DEPARTMENT OF HEALTH

Telephone (060) 30244,
Fax: (060) 30244,
When replying please quote.

REF: MOH/GEN/MUR/Vol V/058

COUNTY DIRECTOR,
MURANG'A COUNTY,
P. O. BOX 69,
MURANG'A

DATE: 13TH DECEMBER 2021

TO WHOM IT MAY CONCERN

RE: DANIEL MUYA GACHATHI

The bearer of this letter has been granted authority to carry out research on '*A model to promote utilization of skilled deliveries among women of reproductive age in Kandara Sub County, Murang'a County - Kenya*'.

Accord him the necessary support.

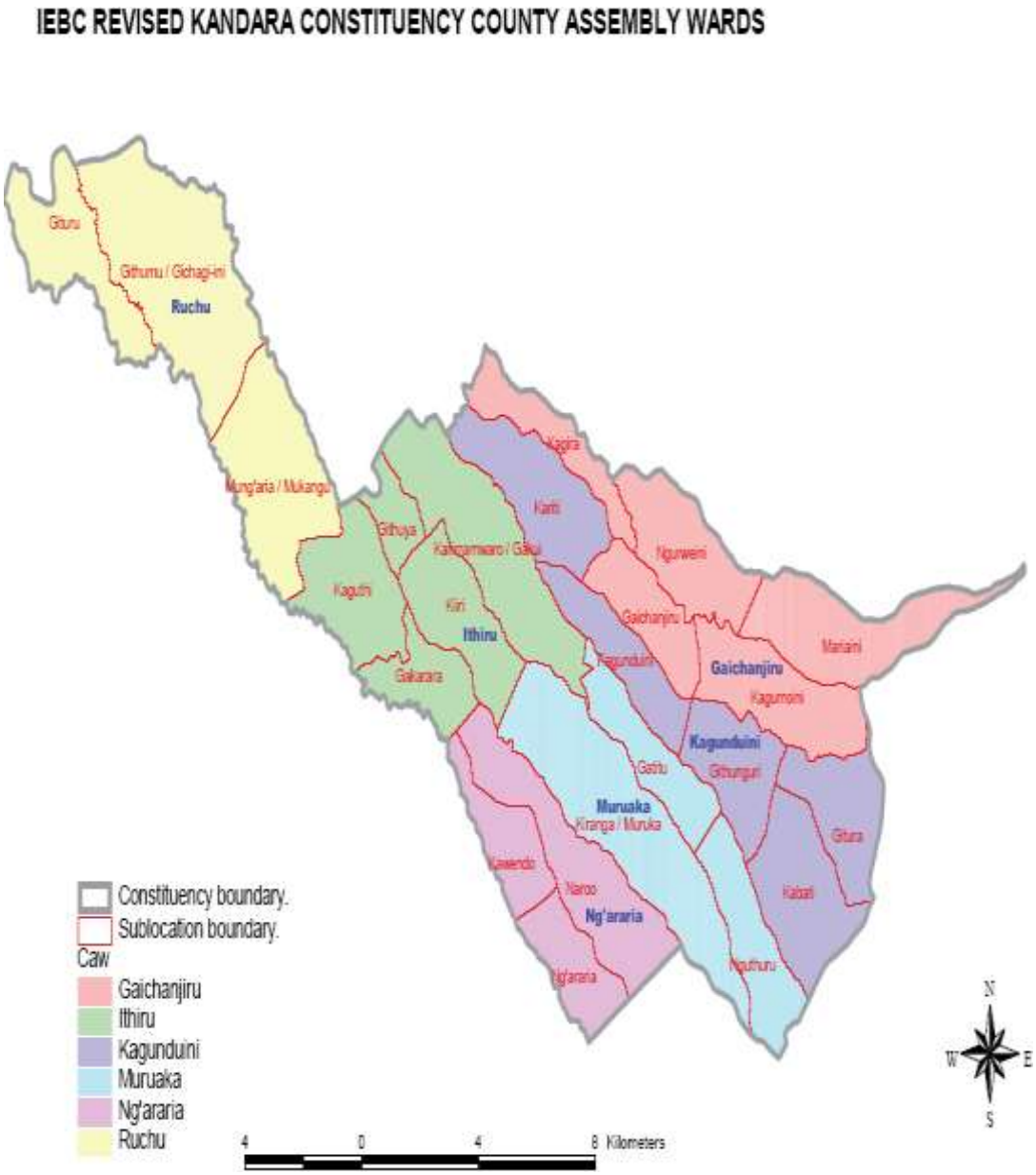
DR. KANYI W.W.
COUNTY DIRECTOR OF HEALTH
MURANG'A COUNTY

Appendix XII: Criteria for Evaluation of the Interim Strategies

S/N	Criterion/Score	1 Strongly Disagree (SD)	2 Disagree (D)	3 Neutral (N)	4 Agree (A)	5 Strongly Agree (SA).
1	Clarity and presentation: Is the Model precise, simple and easily understandable?					
2	Specificity: Is the Model being specific and focused on improving the utilization of skilled birth attendance services?					
3	Reliability Can the model ideally be used consistently in other in similar circumstances?					
4	Clinical Flexibility Are Exceptions of the model identified?					
5	Effectiveness Is the model able to meet the needs and to solve the problems identified by the study findings?					
6	Validity Is the model based on evidence from correctly analyzed and interpreted data?					
7	Relevance Is the model appropriate for improving the utilization of skilled birth attendance services?					
8	Applicability Is the module applicable in the given scope?					
9	**Acceptability:** realistic and ambitious, in line					

	with the existing maternal health strategies.					
10	**Achievability**: could be done by the target group as described in this study					
11	Utilization review: indications of ways in which adherence may be monitored, were explained as operationalization of the strategies					
12	**Out Plausibility:** Does the theory present a plausible solution to a problem? Is it reasonable to believe that if that path is chosen, this will represent a change, by reducing or eliminating the problem?					
13	**Model content and structure**: Are linkages depicted in the diagram logically connected? Are there any gaps in the logic or any breakdowns in temporal sequencing?					
14	**Linkages of the model with existing theories:** Is there sufficient research-based theory that supports the logic and linkages?					

Appendix XIII: Map of Study Area



Appendix XIV: Publication 1

East African Medical Journal Vol. 100 No. 6 June 2023

STRATEGIES TO PROMOTE UTILIZATION OF SKILLED DELIVERY SERVICES IN RURAL COMMUNITIES IN MURANGA – KENYA

Daniel Muya Gachathi MSCN, Nursing, Department of Midwifery, School of Nursing, Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000 - 00200, Nairobi - Kenya, Dr. Drusilla Makworo, PhD, Nursing, Department of General Nursing, School of Nursing, Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000 - 00200, Nairobi - Kenya, Prof. Catherine Mwenda PhD, Nursing, Department of General Nursing , School of Nursing, South Eastern Kenya University, P.O Box 170-90200, Kitui, Kenya

Corresponding author: Daniel Muya Gachathi1 –MSCN, Nursing, Department of midwifery, School of nursing, Jomo Kenyatta University of Agriculture and Technology, P.O. Box 62000 - 00200, Nairobi – Kenya. Email: destiny.gachathi@gmail.com

STRATEGIES TO PROMOTE UTILIZATION OF SKILLED DELIVERY SERVICES IN RURAL COMMUNITIES IN MURANGA – KENYA

D. M. Gachathi, D. Makworo and C. Mwenda

ABSTRACT

***Objective*: The main objective of this study was to identify strategies for improving the utilization of skilled birth attendance services in rural communities in Muranga county, Kenya.**

***Design*: A qualitative research design was employed to gather in-depth insights and perspectives from the participants. The analysis was done using NVIVO software version 13.**

***Setting*: The study was conducted in Kandara sub-County in Muranga, Kenya.**

***Participants*: The study included 48 Community Health Volunteers, 10 Community Extension Workers, and 7 local health administrators.**

***Main Outcome Measures*: The study aimed to identify key strategies for improving the utilization of skilled delivery services. The outcome measures included client education, involvement of family members, community participation, and integration of government policies.**

***Results*: The study established that; client education, involvement of family members, community involvement and integrating government policies are key strategies to improve the utilization of skilled deliveries in the study area.**

***Conclusion*: The study identified various strategies at personal, interpersonal, community, and government levels. to promote the utilization of skilled delivery services that if implemented, can contribute to the reduction of maternal and neonatal morbidity and mortality leading to improve maternal and child health outcomes in the study area and in the republic at large.**

Appendix XV: Publication 2

KENYAN JOURNAL OF

NURSING & MIDWIFERY

A MODEL TO PROMOTE UTILIZATION OF SKILLED HEALTH PROVIDERS AMONG WOMEN OF REPRODUCTIVE AGE IN KANDARA SUB-COUNTY, MURANG'A COUNTY - KENYA

Daniel Muya Gachathi, Drusilla Makworo, Catherine Mwenda

ABSTRACT

Background: Lack of utilization of skilled delivery services by pregnant women contributes to increased number of maternal and neo-natal morbidities and mortalities. In Kenya, skilled deliveries stand at 62% while unskilled deliveries stand at 38%.The maternal mortality ratio in Kenya is at 462 per thousand live births. In the study area, skilled deliveries stand at 65% while home deliveries are at 35%. The main aim of this study was to develop a model of care to improve utilization of skilled birth attendance in the study area.

Methods: A qualitative research design was employed to gather information. Sample size: Women of Reproductive age n= 48, Community Health Volunteers (n=48), Community Extension Workers (n=10) and 7 health administrators. Data Management: Data was thematically arranged and analyzed using NVIVO software version 13.

Results: The study identified key strategies, including client education, family and community involvement, and alignment with government policies, to enhance skilled delivery utilization. These findings contributed to strategies that yielded in development of a model of care for promoting skilled birth attendance and improving maternal-child health in the study area and beyond.

Conclusion: Through a baseline study, the research team identified key client experiences and strategies, leading to the formulation of a model. Evaluation of the model, utilizing criteria from Parady et al. (2021), involved respondent ratings on a Likert scale. A mean score of 4 or higher was deemed acceptable for model adoption, while elements below 3 were eliminated and those at 3 were modified based on expert recommendations. The threshold for agreement, set at a mean score of 4, ensured reliability in consensus decision-making (Bascom et al, 2018). The validated model is now ready for testing and subsequent implementation.

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JOMO Kenyatta university of Agriculture and technology (JKUAT)
Kenya

nurse midwife

Drusilla Makworo
JOMO Kenyatta university of Agriculture and technology (JKUAT)
Kenya

PhD **Jomo Kenyatta University of Agriculture and Technology,**

Appendix XVI: Publication 3

Client's Experiences on Skilled Delivery Services among Women of Reproductive Age in Rural Communities in Kenya

Daniel Muya Gachathi[1*], Drusilla Makworo[1] and Catherine Mwenda[2]

[1]Department of General Nursing, School of Nursing Jomo Kenyatta University of Agriculture and Technology, Nairobi - Kenya, and [2]Department of General Nursing, School of Nursing South Eastern Kenya University, Kitui, Kenya.

***Corresponding author:** Daniel Muya Gachathi Email address: destiny.gachathi@gmail.com

DOI: https://dx.doi.org/10.4314/ajhs.v36i4.10

Abstract

BACKGROUND

Globally Skilled delivery services are critical aspects to combat Maternal and neonatal mortality. In Kenya, skilled deliveries account for 62% of all deliveries; unskilled deliveries pose a higher risk of maternal and neonatal mortality and morbidity. The maternal mortality ratio in Kenya is currently 462 per thousand live births, with 40% of these deaths occurring at home. The main objective of the study was to explore the experiences of women of reproductive age on skilled delivery services.

MATERIALS AND METHODS

The baseline study was conducted between November 2022 and January 2023. It employed a cross-sectional research design involving 347 women of reproductive age. The study aimed to examine their current practices, challenges, and experiences with skilled delivery services. Focus Group Discussions (FGDs) were conducted with 48 recently delivered women (within one year), as well as with 48 Community Health Volunteers (CHVs) and 10 Community Extension Workers (CHEWs). In-depth interviews were also held with local health facility administrators.

Quantitative data analysis was performed using SPSS version 25.0. Measures of central tendency were employed for continuous data tabulation. The analyzed data was then presented through charts, tables, and frequencies. The qualitative data underwent thematic arrangement and analysis using NVIVO version 13 and then triangulated with descriptive data.

RESULTS

The results revealed that (90.6%) of women's previous childbirth experiences influenced their utilization of skilled birth attendance services in subsequent pregnancies. Women who had never given birth in health facilities or had chosen home births were less likely to utilize skilled birth attendance services.