

**EFFECT OF TRADITIONAL BIRTH ATTENDANTS-LED
HEALTH EDUCATION INTERVENTION ON
SELECTED MATERNAL AND CHILD HEALTH
PROMOTION STRATEGIES IN WEST POKOT
COUNTY, KENYA**

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**Effect of Traditional Birth Attendants-Led Health Education Intervention
on Selected Maternal and Child Health Promotion Strategies in West
Pokot County, Kenya**

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**A Thesis Submitted in Partial Fulfilment of the Requirements for the
Degree of Doctor of Philosophy in Public Health of the Jomo
Kenyatta University of Agriculture and Technology**

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DECLARATION

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

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DEDICATION

I dedicate this thesis to my mother, my family and my colleagues for their moral support and encouragement during the writing of this work.

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I thank God Almighty for the gift of life, good health and His sufficient grace that enabled me to write this thesis. I express my gratitude to those who contributed in major or small ways to the contents of this thesis, particularly my supervisors, Prof. Kenneth Ngure and Dr. Susan Mambo, of the School of Public Health, Jomo Kenyatta University of Agriculture and Technology. They provided guidance in the process of writing this thesis. I extend my appreciation to the University of Kabianga for the partial financial support during data collection process. I appreciate West Pokot County's Department of Education and Health for allowing me to carry out this particular study in the Pokot North and Pokot South Sub-Counties; thanks so much for the support accorded to me. My gratitude also goes to my research assistants who included Laban, Clement Rotich, Enock Kachapin and Cheruto Adepa; thanks for your cooperation during data collection. Finally, I am grateful to my nuclear family, Simeon, Peter, Prudence and Daniel, for their moral support during the writing of this work; may God bless you all for your great support. I am indebted to traditional birth attendants who were willing to take part in the study in Pokot South Sub-County. Lastly, I would want to express my appreciation to the mothers who participated in the research in Pokot North and Pokot South Sub-Counties. Thank you very much for participating in this study, and may almighty God richly bless you all.

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ACRONYMS AND ABBREVIATIONS

BCG	Bacille Culmite Gurein
BFHI	Baby-Friendly Hospital Initiative
CHW	Community Health Worker
DRH	Department of Reproductive Health
DTP	Diphtheria Tetanus and Pertussis
EBF	Exclusive Breastfeeding
ENAP	Every New-born Action Plan
EPI	Expanded Programme on Immunization
EPMM	Ending Preventable Maternal Mortality
FP	Family Planning
GoK	Government of Kenya
GVAP	Global Vaccination Action Plan
Hib	<i>Haemophilus influenzae</i> Type B
HIV	Human Immunodeficiency Virus
ICF	International Classification of Functioning
IMCI	Integrated Management of Child Illness
IREC	Independent Research Ethics Committee
IVC	Infant Vaccination Coverage
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KNBS	Kenya National Bureau of Statistics
LMIC	Low- and Middle-Income Countries
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio
MNCH	Maternal and Child Health
MNCHIP	Maternal and Child Health Integrated Programme
MNCHP	Maternal and Child Health Programme
MNH	Maternal New-born Health
MOH	Ministry of Health
NCPD	National Council of Population and Development
PMTCT	Prevention of Mother to Child Transmission

PPFP	Postpartum Family Planning
SBA	Skilled Birth Attendant
SBC	Skilled Birth Care
SDGs	Sustainable Development Goals
SSA	Sub-Saharan Africa
TB	Tuberculosis
TBA	Traditional Birth Attendant
UN	United Nations
UNICEF	United Nations Children’s Education Fund
USAID	United States Agency for International Development
VMHW	Village Maternal Health Workers
WHA	World Health Assembly
WHO	World Health Organization

DEFINITION OF OPERATIONAL TERMS

- Exclusive breastfeeding.** This is a mode of feeding where an infant immediately after birth is fed on breast milk only until she/he is six months of age. No other feeds in form of liquids or solids are given – water is not an exemption – the only substances allowed for these children include; oral rehydration solution, or syrups and drops of vitamins, minerals or medicines when the child is aged below 6 months.
- Health care personnel.** This refers to health care providers who include nurse, public health officer or technician, clinical officer or a medical officer.
- Infant vaccination coverage.** This is the percentage of children below the age of 2 years in a given population that is vaccinated against certain immunizable diseases in a given period of time for example by age 1 year or 2 years of age.
- Postpartum family planning.** This is the prevention of unintended pregnancy and closely spaced pregnancies through the first 12 months following childbirth.
- Skilled birth care.** Delivery conducted by formally trained health care personnel who may include doctors, nurses, midwife and clinical officers, and carried out in a safe environment using sterilized equipment/instruments in a health facility or at home (by community midwives).
- Traditional birth attendant.** A person, especially one in a developing country, who assists a woman during labour and delivery with skills learned by apprenticeship or personal experience rather than by formal training.

Unskilled birth attendants. These are birth attendants who have no formal skills of child delivery, and may include Traditional Birth Attendants and any other person who gives reproductive health services to mothers yet he/she is not formally trained to do so.

ABSTRACT

Despite global progress in maternal and child health, disparities persist in resource-limited settings. Between 2000 and 2017, the global maternal mortality ratio declined by 38%, yet sub-Saharan Africa continues to bear a disproportionate burden. In West Pokot County, Kenya, a region characterized by poor infrastructure, challenging terrain, and high fertility rates, over half of all deliveries are managed by traditional birth attendants (TBAs). Skilled birth care (SBC), exclusive breastfeeding (EBF), postpartum family planning (PPFP), and infant vaccination coverage (IVC), which are maternal, newborn and child health (MNCH) strategies remain critically low, contributing to maternal and child morbidity and mortality. This study evaluated the effect of a TBA-led health education intervention on promoting SBC, EBF, PPFP and IVC in West Pokot County, Kenya. A quasi-experimental design was employed with an intervention group (Pokot South Sub-County) and a control group (North Pokot Sub-County). Baseline and end-line surveys were conducted among 408 expectant mothers, who were followed until their infants reached above nine months of age. In the intervention site, 24 TBAs were recruited, trained using an adapted Ministry of Health (MOH) curriculum, and assigned to expectant mothers to provide health education and advocacy for SBC, EBF, PPFP, and IVC. The control group received standard MOH care. Attrition was 13.2% (n=27) in the intervention group and 21.1% (n=43) in the control group, with a total of 338 participants (177 control, 161 intervention) completing the end-line survey. Analysis progressed from bivariate (Pearson's chi-square) to multivariate (binary logistic regression with three hierarchical models). The intervention group demonstrated significantly better outcomes across all four MNCH strategies. For SBC, 81.4% of intervention mothers delivered in a health facility versus 58.2% in the control group ($p<0.001$). Bivariate analysis yielded an unadjusted odds ratio (UOR) of 3.137 (95% CI: 1.909–5.155), and after controlling for confounders, the adjusted odds ratio (AOR) was 3.180 (95% CI: 1.790–5.651; $p<0.001$). For EBF, 95.0% of intervention mothers practiced exclusive breastfeeding for six months compared to only 23.3% in the control group ($p<0.001$). The effect was very large (UOR=62.561; 95% CI: 28.330–138.152; AOR=71.423; 95% CI: 30.247–168.651; $p<0.001$). For PPFP, 50.3% of intervention mothers were on modern family planning methods versus 13.0% in the control group ($p<0.001$), with consistent effects (UOR=6.779; 95% CI: 3.966–11.588; AOR=6.514; 95% CI: 3.543–11.976; $p<0.001$). For IVC, 92.3% of intervention group children were fully immunized per KEPI schedules compared to 37.3% in the control group ($p<0.001$), with strong effects (UOR=20.200; 95% CI: 10.337–39.474; AOR=13.935; 95% CI: 2.708–71.699; $p=0.002$). The overall model explained 55.2% of the variance in combined outcomes ($R^2=0.552$, $p<0.001$). In conclusion, the TBA-led health education intervention significantly improved the utilization of SBC, practice of EBF, use of modern PPFP, and IVC in West Pokot County. The effects ranged from moderate to very large (3-fold for SBC to 71-fold for EBF) and remained significant after controlling for potential confounders. These findings demonstrate that TBAs, when properly trained and recognized, can serve as effective community champions for MNCH strategies (SBC, EBF, PPFP & IVC) in remote, under-resourced settings. The study recommends that the MOH and county governments recognize the role of TBAs as MNCH champions and referral agents rather than birth attendants. Policy reforms should also address barriers such as distance to facilities, low maternal literacy, and male involvement in family planning decisions. Future longitudinal research is warranted to assess the sustainability of these gains over time.

CHAPTER ONE

INTRODUCTION

1.1 Study Background

Maternal newborn and child health (MNCH) is a cornerstone of public health and an important indicator of a society's well-being (WHO 2024). The health of mothers and children reflects the strength of healthcare systems and shapes the future of communities. According to the World Health Organization (2024), maternal and child mortality remain key indicators for monitoring progress toward the Sustainable Development Goals, underscoring the urgent need for investment in this area to reduce preventable deaths and promote equitable access to care. Therefore, promoting maternal and child health is not only a medical necessity but also a moral and social imperative that requires sustained global commitment.

Between 2000 and 2017, maternal mortality declined by almost 38% yet an estimated 810 women continue to die each day due to complications related to pregnancy and childbirth, with majority of deaths happening in low- and middle-income countries (Lawrence, Klein & Beyuo, 2022). The sustainable development goal (SDG) 3, subsection 1 sets out that by the year 2030, maternal mortality ratio should be reduced to below 70/100000 live births and no country should have maternal mortality ratio greater than 140 per 100,000 live births (WHO 2021). In the same note significant progress has been made in reducing child mortality ratio, which reduced by 44% around the same period, with mortality ratio for children under 5 years worldwide being 43/1000 live-births, which is approximately 2.9 million deaths worldwide (UN IGME, 2022; Blencowe *et al.*, 2016).

Despite this global progress, regional disparities persist. In the sub-Saharan Africa (SSA), maternal and child mortalities are still high, as of 2015, there were 546 fatalities per 100,000 live births and 84 deaths per 1000 live births (Wamai & Shirley, 2022). The MMR is a serious public health issue in Kenya. The MMR was 362 deaths per 100,000 live births nationwide and 565 deaths per 100,000 live births in West Pokot County (Kiptulon, Galgalo, Elmadani, Orsolya, & Siket, 2025). Similarly, in Kenya,

the under-five mortality rate is 52 deaths per 1000 live births in Kenya and 81 deaths per 1000 live births in West Pokot County.

Research has indicated that specific strategies, such as targeted prenatal care for expectant mothers, professional birth care in a medical facility, with the help of a qualified and experienced birth attendant, and exclusive breastfeeding of for the first 6 months of infant's life, post-natal care including postpartum family planning and infant vaccination, have proved to better maternal, new-born and child health outcomes, with potential to reducing maternal and child morbidities and mortalities. (Blazer & Prata (2016); Verbiest *et al*, 2017; Rubee *et al*, 2019 and Coleman *et al*, 2020)

In developing countries especially in low/middle-income countries, Traditional birth attendants play an important role in maternal new born and child health especially where access to formal healthcare is limited (Kassie *et al* 2022). Many babies are born outside health care facilities with most of these births being attended by unskilled birth attendants. This high level of home deliveries is thought to be the key primary factor contributing to high levels of maternal and new-born morbidity and mortality globally (Bucher, Konana, Liechty, Garces, Gisore, Marete, Tenge, Shipala, *et al.*, 2016). Nearly 90% of maternal deaths and 98% of all perinatal mortality take place in these countries where child delivery happens outside a health care facility; by mothers, either alone or with assistance from an untrained family member, a relative or with help from untrained traditional birth attendant (Bucher, Konana, Liechty, Garces, Gisore, Marete, Tenge, Shipala, *et al.*, 2016).

Maternal health education during pregnancy has been found to be a fundamental component of prenatal care, contributing significantly to maternal and new-born and child health outcomes (Herval *et al.*, 2019). In addition to this, research indicates that community based health education intervention is associated with a reduction in adverse perinatal outcomes, such as prematurity and low birthweight(Maldonado *et al.*, 2020). Furthermore, health education programs plays a crucial role in promoting the initiation and sustained practice of breastfeeding, thereby enhancing infant nutrition and overall maternal and child health well-being(Jamaluddin, 2023).

The 2030 Agenda for Sustainable Development emphasizes the significance of ongoing care for expectant mothers and new-born health under Sustainable Development Goal 3, which aims to “Reduce the global maternal death rate to less than 70 per 100,000 live births by 2030” (WHO, 2018). While levels of antenatal care have improved in many parts of the world over the past decade, coverage of deliveries through skilled birth care ranges from 59% in the WHO African Region to over 90% in America, Europe and Western Pacific regions (World Health Organization, 2020).

Skilled birth care is a process by which a woman is provided with adequate care during labour, delivery and the postpartum period. It is a process that requires both skilled attendant and an enabling environment that provides supportive regulation, policies and infrastructure, communication, referral, logistics, supplies and inputs that are necessary for a skilled attendant to provide care (Munabi-Babigumira *et al.*, 2017). Enhancing access to quality care during pregnancy, childbirth, and the postpartum phase is still a key strategy for enhancing the health of mothers, newborns, and children. It is also essential for achieving one of the numerous metrics listed in Sustainable Development Goal 3, which is "Reducing the global maternal mortality ratio (MMR)" (World Health Organization, 2021).

In the provision of healthcare for mothers and newborns, traditional birth attendants (TBAs), sometimes known as indigenous midwives, have been a topic of concern, especially in developing countries where there is lack of infrastructure and trained health care personnel. TBAs in most cases tend to be older women with their own children, who hold status and respect within their community, and have medical knowledge, particularly in herbal medicine and other traditional healing skills (Sibley *et al.*, 2016; Santé *et al.*, 2023). TBAs have been defined by the expert Committee of the World Health Organization (WHO) as those who help mothers give birth, and who first gained these abilities by helping mothers give birth or by training under guidance of other TBAs (WHO, 2018). This apprenticeship involves both observation and imitation. Such women are often highly regarded by the community where they reside and that chooses them to assist women in childbirth (The Leo Project, 2023) (Gavi, 2025).

Traditional birth attendants, are important throughout Asia, where the majority of deliveries occur at home, and they constitute the largest group of birth attendants, managing a significant proportion of births (Santé et al., 2023). In Latin America, TBAs continue to provide maternal health care in rural areas, with Mexico reporting persistent dependence on TBAs for childbirth especially in marginalized communities (UNICEF, 2019). Meanwhile, in other settings, for example, in Ghana, the Ministry of Health (MoH) has recognized the use of TBAs, and deliveries are not managed by medical specialists alone. In this arrangement, TBAs are allowed to handle routine uncomplicated deliveries while complicated obstetric cases are referred to the district hospitals for appropriate management (WHO, 2018).

In order to improve maternal, new-born and child health (MNCH) outcomes, there is need to promote maternal, new-born and child health promotion strategies, which include; skilled birth care (SBC), exclusive breastfeeding (EBF), postpartum family planning (PPFP) and infant vaccination coverage (IVC). This study investigated the involvement of TBAs in advocating for maternal, new-born, and child health strategies, since the majority of mothers in West Pokot County- Kenya, still deliver at home. According to the Kenya Demographic and Health Survey 2022, about 73% of births in West Pokot occur outside health facilities, with a large proportion assisted by TBAs (Kenya National Bureau of Statistics et al. (2023)

The percentage of births conducted through skilled birth care in Kenya remains below universal coverage. In 2016, approximately 70% of births were delivered under skilled birth care with assistance from trained health care providers such as a nurse, midwife, doctor, or clinical officer (World Bank, 2016; UNICEF, 2019). Despite government efforts to raise the proportion of births conducted under skilled birth care, non-skilled birth attendants, including traditional birth attendants, continue to play a vital role in childbirth activities, particularly in rural and marginalized areas like the rural West Pokot County (UNICEF, 2019; WHO, 2018).

In Kenya, safe motherhood initiatives such as the provision of free maternity services are still underutilized by many mothers, particularly those from poor, rural, and remote areas such as West Pokot County of Kenya. The county continues to report high

maternal mortality, with estimates around 565 deaths per 100,000 live births annually (Kenya Ministry of Health, 2017; World Health Organization, 2018). This explains why this study sought to establish the effects of Traditional birth attendants-led intervention on the use of skilled birth care. In addition, almost all maternal deaths can be prevented if mothers undergo birthing process at a health facility, under the care of a skilled birth attendant. Previous studies have revealed that presence of a skilled birth attendant during childbirth in a hygienic environment, with necessary skills and equipment to recognize and manage any emergency complications, reduces the likelihood of birth complications, infection or death of either the baby or mother (Dickson & Amu, 2017).

The global breastfeeding scorecard, which evaluated 194 nations, found that only 40% of children younger than 6 months of age are breastfed exclusively and only 23 countries have EBF rates above 60% (Global Breastfeeding Collective *et al.*, 2017). Evidence shows that breastfeeding has cognitive and health benefits for both the infant and the mother. Breastfeeding is critical during the first six months of life, and that it helps prevent diarrhoea and pneumonia, the major causes of death in infants. It is also reported that mothers who breastfeed have a lower risk of developing ovarian and breast cancer, the two leading causes of death among women (Wanjohi *et al.*, 2016) (Global Breastfeeding Collective *et al.*, 2017).

A study by Wanjohi *et al.* (2016) found that malnutrition can ruin all traits of a child's growth and development, which include motor, cognitive function and social development, and that breastfeeding has been associated with increased intelligence, education attainment at adulthood, productivity, earning ability and social development. Globally, more than 30 million deaths of children are due to sub-optimal breastfeeding practices and, complementary feeding for children begins before the age of six months in the majority of low- and middle-income countries (Khamis *et al.*, 2017). Since no other comparable study has been conducted in the same area, this study aimed to determine the role of traditional birth attendants in supporting the optimal newborn feeding, which comprised exclusive breastfeeding for the first six months after delivery in west Pokot County.

Worldwide, according to the United Nations' 2022 revision of the World Population Prospects, the total fertility rate is now 2.3 children per woman. This global average masks wide regional differences, with Africa remaining the region with the highest fertility, at approximately 4.6 children per woman (United Nations, 2022). For Kenya, fertility rate has been declining from the 1970s, when it was 8.2 children per woman, to 2014, when it was 3.9 children per woman; Kenya's fertility rate has been sharply decreasing (Kenya National Bureau of Statistics et al., 2023). Fertility rates in West Pokot County appear to deviate from the national average. West Pokot County's fertility has been increasing while Kenya's is declining, reaching 7.2 in a span of four years (2010-2014) and 6.9 as per KDHS 2022; thus, the County is ranked one with the highest fertility in the year 2014 in Kenya. Postpartum family planning (PPFP) focuses on the prevention of unintended and closely spaced pregnancies throughout the first twelve months after childbirth. It is intended to help women decide on the contraceptive to use later for a longer period of time (The World Health Organization 2025).

Since total fertility rate in West Pokot County is quite high currently at 6.9 children per woman, there is the need to come up with interventions that are community/culturally friendly to encourage community members to utilize modern family planning services available within the County, so as to check the high fertility rate. This is why the study sought to determine the effect of TBAs on the uptake of modern family planning methods in the County.

Immunization is among the most cost-effective public health interventions for reducing global childhood morbidity and mortality (Abdou *et al.*, 2017). WHO recommends that vaccines be administered during the first years of life within a specified schedule and time range to ensure children's optimal response, reduced individual vulnerability and prevention of the recurrence of disease outbreak inside communities (Abdou *et al.*, 2017). Infant vaccination coverage has been defined as the proportion of children who are immunized in a given period of time below 24 months of age (Abdou *et al.*, 2017). Immunization prevents illness, disability and death from vaccine-preventable diseases, which include diphtheria, hepatitis B, measles, mumps, pertussis, pneumonia, polio, rotavirus diarrhoea, rubella and tetanus. It averts an estimated 2-3 million deaths every year (Nigeria: WHO and UNICEF Estimates of Immunization Coverage: 2016

Revision Nigeria : WHO and UNICEF Estimates of Immunization Coverage : 2016 Revision, 2018).

The percentage of children receiving diphtheria, tetanus and pertussis (DTP) containing vaccine is often used as an indicator of how well countries are providing routine immunization services (Nigeria : WHO and UNICEF Estimates of Immunization Coverage : 2016 Revision Nigeria : WHO and UNICEF Estimates of Immunization Coverage : 2016 Revision, 2018). WHO and UNICEF data on global immunization coverage shows that 86% of the world's children received the required 3 doses of diphtheria, tetanus and pertussis (DPT3) in 2015, a coverage level that has been sustained above 85% since 2010. As a result of this, the numbers of children who did not receive routine vaccination has dropped to an estimated 19.4 million, down from 33.8 million in 2000, a progress that still falls short of immunization target of global vaccination action plan (GVAP) (WHO 2016-Maternal Mortality Report, n.d.).

Africa has the lowest childhood vaccination coverage worldwide. Subsequently, in the sub-Saharan Africa (SSA) the vaccination coverage stood at 76% in 2015. Besides, there are also regional differences in DTP3 coverage of 79% in East and Southern Africa (Kazungu & Adetifa, 2017). If the full benefits of childhood vaccination programmes are to be enjoyed in Sub-Saharan Africa, all countries within the region need to improve on vaccine delivery to achieve and sustain high vaccination coverage.

In such countries where vaccine-preventable diseases are the major contributors to high child mortality, vaccine timelines is crucial to reverse the situation (Abdou *et al.*, 2017). In Kenya, vaccination coverage of the 6 common vaccine-preventable diseases, namely TB (Tuberculosis), diphtheria, whooping cough (pertussis), tetanus, polio and measles, stood at 79% in 2015 (National Bureau of Statistics-Kenya and ICF International, 2023). Other childhood vaccines given in Kenya protect against hepatitis B and Haemophilus influenza type B (HiB). The Kenyan immunization programme considers a child to be fully vaccinated if the child has received all the basic vaccinations, including three doses of the pneumococcal conjugate vaccine (PCV), given at age 6, 10, and 14 weeks (Kenya National Bureau of Statistics et al. (2023). In West Pokot County, 31% of children aged 12-23 months are said to be fully immunized, which is

very low compared to the national level of 79%. Therefore, the purpose of this study was to determine whether using a TBA-led health education intervention could help improve the vaccination coverage in the County and increase child survival in the region.

1.2 Statement of the Problem

Every day, approximately 830 women die from preventable causes related to pregnancy and childbirth worldwide. About 99% of all these maternal deaths occur in developing countries and are higher among women living in rural areas and poorer communities (WHO, 2021). Most complications that occur during pregnancy and childbirth are preventable and treatable. Evidence shows that early and regular attendance of antenatal care, together with delivery in a health care facility attended by a trained health worker, is linked to improved maternal and child health outcomes (Doctor *et al.*, 2018). Globally, more than 30 million child deaths are attributable to sub-optimal breastfeeding practices (Khamis *et al.*, 2017).

Kenya has made notable progress, yet significant disparities persist across counties. According to the Kenya Demographic and Health Survey (KDHS, 2022), the national maternal mortality ratio stands at 355 per 100,000 live births. However, West Pokot County continues to experience a disproportionate burden of maternal and child mortality, with a ratio of 565 per 100,000 live births, substantially higher than neighboring counties such as Turkana (412/100,000) and Trans Nzoia (378/100,000). Similarly, neonatal mortality in West Pokot is 27 deaths per 1,000 live births, compared to 21 in Turkana and 18 in Trans Nzoia, and remains significantly above the national average of 21/1,000 (Nkhana-Salimu & Abdulsalam-Anibilowo, 2018; Sialubanje, Massar, Hamer & Ruiter, 2015).

These excess deaths are preventable and reflect deep inequities in access to quality care. West Pokot has one of the highest fertility rates in Kenya at 6.9 children per woman, comparable only to Mandera (7.7) and Wajir (6.8), and far exceeding the national average of 3.4 (Khamis, Omar, Suleiman & Ali, 2017). The under-five mortality rate is 81 deaths per 1,000 live births—double the national rate of 41/1,000, and stunting affects 34% of children, nearly twice the national average of 18% (KDHS, 2022).

Low uptake of evidence-based interventions drives this crisis. Skilled birth coverage (SBC) in West Pokot is only 55.0%, compared to 89% nationally. Exclusive breastfeeding (EBF) stands at 31.2% (national 60%), modern postpartum family planning (PPFP) at 23.2% (national 57%), and full child immunization at just 11% (national 80%) [KDHS 2022; World Vision International, 2017]. Furthermore, home delivery remains the norm, with 74% of births occurring at home, 69% of which are assisted by traditional birth attendants (TBAs) (KDHS, 2014).

The Kenyan government has introduced policies such as free maternity services and the Beyond Zero campaign to address these barriers. Yet, the county did not meet the maternal and child health Millennium Development Goals (MDGs) by 2015 (Ministry of Health, 2016). The Sustainable Development Goals (SDGs), specifically Target 3.1 (reduce global maternal mortality to below 70 per 100,000 live births) and Target 3.2 (end preventable newborn and under-five deaths, with neonatal mortality ≤ 12 per 1,000 and under-five mortality ≤ 25 per 1,000 live births), cannot be achieved without urgent action in high-burden counties like West Pokot (KNBS & ICF International, 2015; World Vision International 2017).

Innovative, community-based solutions are essential. TBAs enjoy deep trust and respect in West Pokot's rural communities, yet they remain unrecognized from formal maternal and newborn health (MNH) service delivery. Therefore, this study sought to determine whether a TBA-led health education intervention could effectively promote skilled birth care, exclusive breastfeeding, postpartum family planning, and infant vaccination in the county, and thereby reduce maternal and child morbidity and mortality.

1.3 Justification of the Study

Globally, substantial progress has been made in reducing maternal mortality over the past two decades. Between 2000 and 2020, the global maternal mortality ratio (MMR) declined by approximately 34%, from 339 to 223 deaths per 100,000 live births (WHO, 2023). Despite this progress, the annual rate of decline has been insufficient to meet the Sustainable Development Goal (SDG) target 3.1 of reducing the global MMR to below 70 per 100,000 live births by 2030. Sub-Saharan Africa continues to bear the heaviest

burden, accounting for approximately 70% of all maternal deaths worldwide, with an MMR of 536 per 100,000 live births in 2020 (UNICEF, 2023).

In Kenya, maternal mortality has shown a slow and uneven decline over time. According to the Kenya Demographic and Health Surveys, the MMR decreased from 488 per 100,000 live births in 2008 to 362 per 100,000 live births in 2014, and further to 355 per 100,000 live births in 2022 (KNBS & ICF, 2023). This represents a reduction of only 27% over 14 years, which is far below the pace required to achieve the SDG target. Notably, these national average masks profound regional disparities. West Pokot County, the focus of this study, had an MMR of 565 per 100,000 live births in 2014, which was 56% higher than the national average at that time (KDHS, 2014). More recent estimates suggest that while some improvements have occurred, West Pokot continues to lag behind other counties, with an MMR approximately 60% higher than neighboring Trans Nzoia County (378/100,000) and 37% higher than Turkana County (412/100,000) (Ministry of Health, 2022).

The World Health Organization recommends a ratio of one trained midwife for every 175 pregnant women; however, this standard remains far from being achieved in many parts of Kenya, particularly in rural and pastoralist counties like West Pokot (Turinawe *et al.*, 2016). Nationally, the percentage of births attended by skilled birth attendants has increased from 44% in 2008 to 62% in 2014 and to 89% in 2022 (KDHS, 2022). However, in West Pokot County, skilled birth attendance remains stubbornly low at 55%, and home delivery continues to be the norm, with 74% of births occurring at home, 69% of which are assisted by traditional birth attendants (KDHS, 2014; World Vision International, 2017).

The Government of Kenya has introduced several policies to address barriers to maternal health care, including free maternity services, elimination of user fees for primary care, and the nationwide Beyond Zero campaign spearheaded by the former First Lady, Hon. Margaret Kenyatta, aimed at ensuring that no woman dies while giving birth (Ministry of Health, 2016). Despite these efforts, Kenya did not achieve the maternal and child health Millennium Development Goals (MDGs) by 2015, and progress toward SDG targets remains insufficient (MOH, 2017).

Given that more than half of all childbirths in West Pokot County are managed by traditional birth attendants, there have been efforts by the Kenyan government to establish a community-based midwifery initiative. Globally, ongoing debate focuses on finding the most effective and least harmful way to potentially integrate TBAs into the maternal and newborn health (MNH) service continuum (Ogolla, 2015). West Pokot County is characterized by poor infrastructure, challenging terrain, and limited access to formal health facilities. This context necessitates the use of locally available and culturally acceptable resources, even as efforts are made to enhance access to modern health care services. Traditional birth attendants represent one such locally available resource. They are deeply trusted and respected within their communities, and they are often the first, and sometimes the only, point of contact for pregnant women in these areas.

This study sought to determine whether engaging TBAs as advocates for skilled birth care, exclusive breastfeeding, postpartum family planning, and infant vaccination could effectively promote these maternal and child health strategies in West Pokot County. The study then assessed the effect of these interventions. No other similar study had been carried out in West Pokot County to establish the effect of TBA involvement in promoting these critical maternal and child health strategies.

The findings of this study contribute to the realization of SDG target 3.1 (reducing maternal mortality to below 70 per 100,000 live births) and SDG target 3.2 (ending preventable newborn and child deaths), as well as the broader SDG 3 goal of ensuring healthy lives and promoting well-being for all at all ages (United Nations, 2017). In doing so, the study aligns with the goals of the social pillar of Kenya Vision 2030, which emphasizes structural change and greater community involvement in service management. This study positions TBAs as part of the local community resource base that can be mobilized to improve maternal and child health outcomes in one of Kenya's most disadvantaged regions.

1.4 Objectives

1.4.1 Broad Objective

To evaluate the effect of a health-education intervention led by traditional birth attendants on maternal and child health promotion strategies in West Pokot County, Kenya.

1.4.2 Specific Objectives

- i. To assess the effect of traditional birth attendants-led health education intervention on utilization of skilled birth care in West Pokot County
- ii. To assess the effect of traditional birth attendants-led health education intervention on practice of exclusive breastfeeding in West Pokot County
- iii. To determine the effect of traditional birth attendants-led health education intervention on use of modern postpartum family planning methods in West Pokot County
- iv. To determine the effect of traditional birth attendants-led health education intervention on infant vaccination coverage in West Pokot County.

1.5 Research Questions

- i. What is the effect of traditional birth attendants-led health education intervention on utilization of skilled birth care in West Pokot County?
- ii. What is the effect of traditional birth attendants-led health education intervention on practice of exclusive breastfeeding in West Pokot County?
- iii. What is the effect of traditional birth attendants-led health education intervention on use of modern postpartum family planning methods in West Pokot County?
- iv. What is the effect of traditional birth attendants-led health education intervention on infant vaccination coverage in West Pokot County?

1.6 Hypotheses

Grand Null Hypothesis (H_0): There is no significant difference in the odds of utilizing maternal, new-born, and child health (MNCH) strategies between mothers and children of mothers who receive the traditional birth attendant (TBA)-led health education intervention and those who receive standard care only.

1.7 Significance of the Study

This study has significant implications for multiple stakeholders, including individual mothers and children, families and communities, health care practitioners and policymakers, and the academic community. The findings provide evidence on whether a traditional birth attendant-led health education intervention can effectively promote skilled birth care, exclusive breastfeeding, postpartum family planning, and infant vaccination coverage in a remote, resource-limited setting. The significance of the study is presented at three levels: individual, societal, and academic.

The study benefits expectant mothers and their children by demonstrating an intervention that can improve their health outcomes. Mothers who participated in the intervention group received education and encouragement from TBAs, leading to higher utilization of skilled birth care (81.4% vs. 58.2% in the control group), higher rates of exclusive breastfeeding for the first six months (95% vs. 23.3%), greater use of modern postpartum family planning methods (50.3% vs. 13%), and higher infant vaccination coverage (92.3% vs. 37.3%). These improvements directly translate into reduced risks of maternal and child morbidity and mortality. For an individual mother, delivering in a health facility under skilled care reduces her risk of obstetric complications, infections, and death. For an infant, exclusive breastfeeding for the first six months after birth lowers the risk of diarrhea and pneumonia, while full immunization as per KEPI schedules protects against vaccine-preventable diseases. Therefore, the intervention offers a practical, low-cost strategy for improving individual maternal and child health outcomes in rural, hard-to-reach areas. The study benefits families, communities, health care providers, and policymakers. Families benefit from healthier mothers and children, which reduces the economic and emotional burden of caring for sick family members and burying those who die from preventable causes.

Communities benefit from a healthier population, which enhances productivity and reduces the strain on already overstretched health facilities. For health care practitioners and the Ministry of Health, the study provides evidence that TBAs—when properly trained and given a clearly defined role as maternal and child health care champions, and referral agents rather than birth attendants, —can serve as valuable community champions for maternal and child health. This finding is particularly important for counties like West Pokot, where formal health facilities are few, infrastructure is poor, and TBAs are already trusted and utilized by the majority of mothers. Policymakers at both the county and national levels can use these findings to reconsider current policies that often ban or marginalize TBAs. Instead of excluding TBAs from the formal health system, policymakers can integrate them into the maternal and child health continuum as community maternal and child health champions and referral agents. This approach aligns with the World Health Organization's Traditional Medicine Strategy (2014-2023), which encourages member states to integrate traditional medicine practitioners into health systems where appropriate. Furthermore, the study contributes to Kenya's efforts to achieve the Sustainable Development Goals (SDG 3.1 and 3.2) and the social pillar of Kenya Vision 2030 by demonstrating a community-based, culturally appropriate intervention that can reduce maternal and child morbidity and mortality in marginalized regions.

The study contributes to the body of knowledge on the role of traditional birth attendants in maternal and child health promotion. While numerous studies have documented the reasons why women prefer TBAs, and while many studies have described TBA practices, there is limited empirical evidence from quasi-experimental studies that have actually trained TBAs to promote specific MNCH strategies and then measured the outcomes. This study fills that gap by providing rigorous quantitative data from an intervention in a real-world setting. The study's findings on the large effect sizes (odds ratios ranging from 3.1 for SBC to 62.6 for EBF and 20.2 for IVC) provide compelling evidence that TBA-led health education can be highly effective. The study also contributes to the theoretical understanding of health behaviour change by applying the Health Belief Model, demonstrating that cues to action from trusted community members (TBAs) can significantly influence perceived benefits, reduce perceived barriers, and enhance self-efficacy among mothers. Future researchers can build on this

study by conducting longer-term longitudinal studies, by testing the intervention in other cultural contexts, or by conducting qualitative studies to explore the mechanisms through which TBAs influence maternal health behaviours. Finally, the study's methodology—including the detailed curriculum adaptation process, the recruitment and training of low-literacy TBAs, and the use of mother-child health booklets to verify outcomes—provides a replicable model for future intervention research in similar settings.

CHAPTER TWO

LITERATURE REVIEW

2.1 Traditional Birth Attendants' And Skilled Birth Care

The World Health Organization's vision for post-2015 aims for a world where every pregnant woman and new-born receives quality care throughout pregnancy, childbirth, and the postnatal period. This vision aligns with two complementary global action agendas developed by the World Health Organization and its partners in 2013-2014: the initiative to end preventable maternal mortality (EPMM) and Every New-born Action Plan (ENAP). This strategy is articulated at a critical time when the global community is developing a new comprehensive and international strategy for Health of women, children, and adolescents (2016-2030) during the post-2015 Sustainable Development Goal period (Tunçalp *et al.*, 2015). Over 70% of maternal deaths occur because of complications of pregnancy and childbirth. These complications include haemorrhage, hypertensive disorders like pre-eclampsia, eclampsia, sepsis and abortion. Complications of preterm birth, asphyxia, intrapartum-related neonatal infections, all account for about 85% of neonatal mortalities (Tunçalp *et al.*, 2015). The time of childbirth and the period immediately after delivery of a baby are critical for maternal and neonatal survival and wellbeing. Proficient treatment to avert and address difficulties during this crucial phase is expected to substantially decrease maternal mortality, stillbirths, and early neonatal fatalities (Tunçalp *et al.*, 2015).

Sserwanja *et al.* (2021) state that the World Health Organization advocates for skilled birth care facilitated by a formally trained birth attendant as a crucial strategy, among other interventions, to reduce maternal and neonatal/child morbidity and mortality in both high-income and low-income countries. Globally, several studies have been carried out with regards to interventions involving traditional birth attendants to improve the use of skilled birth care. For example, the study results of Jiang and colleagues in China uplift the utilization of skilled birth care during childbirth. According to the research conducted by these authors, they recommended a childbirth policy based in institutions for rural areas, which became a fundamental part of a new national safe motherhood policy in China (Jiang *et al.*, 2016). In this policy, the function

of traditional birth attendants (TBAs) was changed. TBAs were instructed to cease home deliveries and promote childbirth in health institutions, while also contributing to maternal health care as village maternal health workers (VMHW). Therefore, China successfully integrated TBAs into the health care system in rural regions with the goal of universal access to skilled birth attendance (SBA). As a result of this, China was able to attain the millennium development goal (MDG) 5a, so that, by the year 2015, this country recorded maternal mortality ratio (MMR) of 23/100,000 live births (Jiang *et al.*, 2016). The present study draws insight from the reviewed work to find ways to ensure West Pokot County realizes the aspirations of reducing maternal mortality through the adoption of skilled birth services.

Sarmiento *et al.*, (2021) conducted a review of experimental and mixed-methods studies assessing maternal health issues in native communities of Mexico and the Americas, with a specific focus on the influence of traditional birth attendants on maternal health outcomes. The review identified three randomized studies relating to traditional midwives, one of which specifically addressed the practice of traditional midwifery. The authors concluded that there is sustained and growing scholarly interest in the role of traditional midwives, particularly within indigenous and native communities, highlighting the need for further empirical research on how these community-based providers can be effectively engaged to improve maternal health.

Similarly, a study by (Wan Sri Widaningsih & Nurman Achmad, 2021) explored the factors influencing expectant mothers to seek the assistance of traditional birth attendants during delivery in Bangko District, Indonesia. This Indonesian study aimed to establish the relationship between maternal health care and the use of traditional birth attendants. The findings revealed that various socio-cultural and economic factors influence mothers' preference for traditional birth attendants during childbirth. The factors included hereditary habits, traditions and cultural belief that women and children should be assisted by TBAs in the community, and thus reinforcing social relations between the expectant mothers and the traditional birth attendants. It was fascinating to explore whether these factors were also applicable in the context of West Pokot County. Therefore, the present study focused on examining the effect of a traditional birth

attendants (TBAs)-led health education intervention on the promotion of maternal, new-born, and child health strategies in West Pokot County, Kenya.

In Tajikistan, Miskinzod (2021) conducted a qualitative study that explored health care providers' perspectives on the knowledge and practices of traditional birth attendants (TBAs). The findings revealed that health care providers held extremely negative perceptions regarding the competencies and practices of TBAs, often viewing them as a barrier to safe maternal and child health outcomes. They especially decried the inadequate biomedical knowledge and practices they had seen in the delivery processes undertaken by TBAs. The respondents stated that TBAs had poor skills of infection prevention and lacked hygienic delivery practices (Miskinzod, 2021). The reviewed study underscores the unique challenges that TBAs face and the need to promote the use of skilled birth attendants, which was a concern of this study.

In their study, Lassi and Bhutta (2015) investigated community-based strategies aimed at reducing maternal and neonatal health complications and improving outcomes for newborns. Their study highlighted that a considerable proportion of deliveries take place outside formal health facilities and without the assistance of trained medical personnel. Contributing factors included economic hardship, poor health among expectant mothers, low literacy levels, lack of awareness about existing health services, limited autonomy in household decision-making, poor access to transportation, and weak connections between communities and health care systems.

In a Cameroon study, (Yaya *et al.*, 2021) looked at the predictors of skilled birth service utilization among married women. This study established factors that influence mothers' decisions to go for skilled birth services. The factors included; maternal level of education, place of residence, religious beliefs and one's family's economic status among others. Another study in Ghana also provided similar reasons for mothers' choice for seeking traditional birth attendants' services during child delivery, despite availability of health care facilities in Northern Ghana (Tabong *et al.*, 2021). Another descriptive cross-sectional study also found that information, education and communication (IE&C) influence decisions to use prenatal and skilled delivery services in Tano North District of Ghana (Amponsah *et al.*, 2021). Still in Ghana, Yawson and

Nursing (2021) investigated the perceptions of modern midwives and pre-service midwives about the practice of TBAs. The study found that the success of the programme of TBAs in the region was strongly dependent on cooperation and collaboration with the conventional midwives (Yawson & Nursing, 2021). These studies were conducted in West Africa and provided insight to the present study in examining the effect of various interventions on the use of skilled birth services in West Pokot County, Kenya.

In Guinea, Ahinkorah *et al.* (2021) studied the determinants of antenatal care and skilled birth care service utilization among expectant women. Data for the study was drawn from the 2018 Guinea demographic health surveys data. The findings showed that younger women and those with high school education and above, those whose partners had secondary education and above and those who were wealthy were more likely to utilize antenatal clinic and skilled birth care services (Ahinkorah *et al.*, 2021).

A study in rural Nigeria examined the reasons expectant mothers prefer TBA services during childbirth to going for skilled birth care services (Ntoimo *et al.*, 2022). The respondents mentioned similar reasons as indicated in the previously reviewed works from Ghana, Cameroon and Guinea. It was also indicated that the preference of TBAs to skilled birth services was a factor for high maternal and child mortalities in the region. Similarly, in Zimbabwe, a study by (Choguya, 2015) found that majority of births (a half of all births) take place at home and are attended to by Traditional Birth Attendants. The study thus recommended the need to develop programmes inclusive of traditional healers who reflect the socio-cultural beliefs of the community and understand the local context of their communities.

From East Africa and surrounding regions, more recent studies on TBAs and skilled birth care have been undertaken in Ethiopia, Tanzania and mainly Kenya. In Ethiopia, a study by Kassie *et al.* (2022) looked at the continuation of Traditional birth attendants' services in inaccessible rural communities and the problems of integration of these TBAs into the health care facilities in West Omo zone. This study established that TBAs in the remote areas were very vital in saving mothers and babies' lives. It was also found out that TBAs did not only take care of mothers during pregnancy, labour and post-

delivery period but also provide social support though without any formal integration to health facility and no any formal relevant training (Kassie *et al.*, 2022).

Shimpuku *et al.* (2021) undertook a qualitative study to examine the perceived different roles plaid by traditional birth attendants among rural communities in Tanzania. The study outcomes showed that, in Tanzania, formal health care systems do not acknowledge the role of TBAs and that their contribution neither is limited and not clear nor well described in the government's Ministry of Health policy document. The reviewed study underlines the fact that TBAs are still excluded in the entire spectrum of maternal and child health care. As such, there was need to explore how interventions that integrate TBAs affect women's odds of using skilled birth services in the County of West Pokot, Kenya.

In Kenya, a study undertaken by Gitonga *et al.* (2018) in Migori County evaluated interventions to increase skilled birth attendance. This study found that demographic characteristics such as having one's mother as a birth companion and possessing a mobile phone number significantly improved skilled birth attendance. However, skilled birth service usage was reduced by other factors such as being married and having contact with traditional birth attendants. The study thus recommended that policy makers should re-strategize the involvement of TBAs in the efforts to scale up skilled birth care (Gitonga *et al.*, 2018). This recommendation was of interest to the present study which sought to determine if interventions involving TBAs have any effect on women's choice of skilled birth care services in West Pokot County, Kenya.

Farah *et al.* (2016) also undertook a study in Mandera County, Kenya, to examine the demographic and economic factors associated with uptake of skilled birth delivery services among women of reproductive age. The study used mixed methods and the findings revealed that the factors that significantly predict utilization of skilled delivery are maternal education, economic status and spouses education and income (Farah *et al.*, 2016). The current study drew insight from the reviewed work to examine the effect of involving TBAs in influencing uptake of skilled birth services among women in West Pokot County.

Another inquiry undertaken by Manyiwa (2018) in Mombasa County wanted to understand factors that contribute to majority of expectant mothers to seek traditional birth attendant's services. The study found that some of the reasons mothers go for TBAs' services, include the fact that TBAs are members and live among them within their community. Other reasons include poverty, culture, long distance to health care facilities, and fear of harassment from nurses among other (Manyiwa, 2018). The study adopted these findings in designing the current research to explore if women in West Pokot County experience similar hindrances in accessing skilled birth care.

Mwoma *et al.* (2021) also undertook a study in Northern Kenya, specifically in Ifo Camp, Dadaab, to investigate the prenatal and postnatal mothers' perspectives on the role of TBAs in providing caregiving support to refugee women during pregnancy and after birth. The study found that TBAs play a critical role in supporting mothers during pregnancy and after delivery. However, most TBAs were incapable of attending to complications associated with delivery (Mwoma *et al.*, 2021). The current study integrated TBAs in designing and implementing interventions to promote uptake of skilled birth care among women in West Pokot. Part of the aims of this approach was to identify the limitations that TBAs face in helping mothers in rural areas, as well as recommend solutions to help TBAs provide the best possible care before, during and after childbirth.

Nyongesa *et al.* (2018) studied the factors that influence the choice of skilled birth attendants' services, drawing data from KDHS of 2014. The study identified factors such as cost, mother's level of education, number of ANC visits and sex of the service provider as strongly associated with mothers' intentions to utilize SBC during delivery (Nyongesa *et al.*, 2018). These factors underline the fact that in Low and Middle Income Countries, Kenya included, studies have shown that TBAs attend to a large percentage of baby deliveries taking place outside health facilities (Walters *et al.*, 2016), (Bucher, Konana, Liechty, Garces, Gisore, Marete, Tenge, Shipala, *et al.*, 2016).

A study by Mangeni and colleagues explored male involvement in maternal and child healthcare as a determining factor for utilization of SBC in Kenya. The study revealed that most maternal deaths occur in the late 3rd trimester and in the 1st week of delivery

mainly due to obstetric complications (Mageni *et al.*, 2013). The study also showed that SBC is directly linked to the MMR. Moreover, the study found that, in most families, men play a key role as decision-makers in the family and thus have much influence on improving SBC. The reviewed study underlines the role of family factors in uptake of SBC in rural families in Kenya, an issue that the present study explored in West Pokot.

Tomedi *et al.* (2015) investigated an approach to raise the number of deliveries by assistance from skilled birth attendants in Kenya. The study was carried out in the former Eastern province and involved the use of TBAs to encourage mothers to deliver babies in a formal health institution. In this intervention, the TBAs were paid some stipend in form of monetary fund whenever they accompanied a pregnant woman to deliver at a health facility by skilled birth attendant. Following the interventions, the study reported improvement of skilled deliveries during the intervention period. Therefore, it was concluded that involvement of TBAs can help scale up utilization of SBC in poor and remote areas in Kenya. This conclusion inspired the current study to provide TBA-led interventions to upscale the uptake of SBC services by mothers in West Pokot County of Kenya. However, unlike in the reviewed work, in the current study, traditional birth attendants were not provided with monetary incentives. They were instead to be rewarded by the expectant mothers under their care as had been the custom in the community.

In West Pokot County, (Sirya, 2019) conducted a study to determine factors that determine mothers' choice of where to deliver their baby and what motivates mothers to opt for traditional birth attendants' services. This study further found that majority of mothers (about 90.7%) delivered their babies at home. These mothers preferred TBAs because of many factors, including distance to the nearest health facility, poor road networks, the fact that TBAs were well known to them compared to skilled birth attendants, influence by males who are the sole decision-makers in most families, among other factors. From the work of Sirya, the present study drew insight to develop relevant TBAs-led interventions to promote the uptake of skilled birth care in West Pokot County. The study then assessed the efficacy of those interventions in promoting utilization of skilled birth care services in the County.

2.1.1 Knowledge Gaps in Skilled Birth Care

The studies reviewed in this section documented the various factors influencing the prevalent use of TBAs compared to SBC services, especially in Africa and particularly in Kenya. However, none of these studies focused on specific interventions put in place to promote uptake of SBC services. Moreover, none of the studies have focused on TBAs-led health education interventions and assessed the effectiveness of such interventions in promoting the use of skilled birth care services in West Pokot County, Kenya. Unlike in other studies where the TBAs were given monetary or incentives in other forms, the TBAs in this study were appreciated by the assigned expectant mothers as had been the custom in the community. Therefore, the expectant mothers assigned to the TBA treated them with the usual individual gifts. The study intervention was carried out in a natural environmental setting of the rural people of West Pokot County in Kenya.

2.2 Traditional Birth Attendant's Influence on Exclusive Breastfeeding

Breastfeeding is an incomparable way of providing ideal food for the healthy growth and development of infants; it is an integral part of the reproductive process with important implications for the health of mothers (WHO, 2018). Review of literature has shown that, on a population basis, exclusive breastfeeding for 6 months is the optimal way of feeding infants; thereafter, infants should receive complementary foods with continued breastfeeding up to 2 years of age or beyond (WHO, 2018).

Globally EBF trends are very low, as indicated by the global breastfeeding records drawn from 194 nations. The evaluation found that about 40% of children aged below 6 months are breast-fed exclusively and only 23 countries have EBF rates above 60% (WHO & UNICEF, 2017).

Evidence shows that breastfeeding has cognitive and health benefits for both infant and the mother. Breast milk is said to be critically important for this age group as it helps prevent diarrhoea and pneumonia; in addition, mothers who breastfeed have a reduced risk of ovarian and breast cancer (WHO & UNICEF 2017; WHO, 2018). To enable mothers establish and sustain exclusive breastfeeding for the first 6 months after birth,

WHO and UNICEF recommend the initiation of breastfeeding within the first one hour of life after baby delivery, exclusive breastfeeding – where infant only receives breast milk without any additional food or drink, not even water, and breastfeeding on demand – that is, as often as the child wants, day and night, and no use of bottles, teats or pacifiers.

While breastfeeding is a natural act, it is also a learned behaviour. Research has demonstrated that mothers and other caregivers require active support for establishing and sustaining appropriate breastfeeding practices. WHO and UNICEF launched the baby-friendly hospital initiative (BFHI) in 1992, to strengthen maternity practices to support breastfeeding (WHO, 2018). The BFHI has been implemented in about 16,000 hospitals in 171 countries and it has contributed to improving the establishment of exclusive breastfeeding worldwide. While improved maternity services help to increase the initiation of exclusive breastfeeding, support throughout the health system is required to help mothers sustain exclusive breastfeeding. This means support even from community members like TBAs, who are recognized, trusted and respected by communities where they live in, such as where this study was carried out.

Basic breastfeeding support skills are part of the 11-day Integrated Management of Childhood Illness (IMCI) training course, for first-level health workers (WHO, 2018). The training combines skills for adequate case management with preventive care. Evaluation of breastfeeding counselling delivered by trained health professionals as well as community health workers has shown that this is an effective intervention to improve exclusive breastfeeding rates (WHO, 2018). This view by WHO supports the approach taken in the present study, namely combining efforts from both TBAs and trained health care workers to promote practice of exclusive breastfeeding among mothers. All these strategies by WHO/UNICEF, though implementation and effect are not well documented, seem not effective enough to promote EBF for the first 6 months in rural set-ups like West Pokot County where the rate is about 26.4%. KDHS 2014 (National Bureau of Statistics-Kenya and ICF International, 2015).

Galipeau *et al.*, (2018) undertook a study to assess the effectiveness of interventions on breastfeeding. The study specifically assessed the efficacy of an intervention on breastfeeding self-efficacy and perceived insufficient milk supply outcomes. The study revealed that meta-analysis of randomized controlled trials interventions significantly improved breastfeeding self-efficacy during the first four to six weeks and further had an impact on EBF duration (Galipeau *et al.*, 2018). The reviewed study showed that well-implemented interventions have an effect on mothers' choices in breastfeeding. Therefore, the present study examined the influence of TBA-led health education interventions in enhancing breastfeeding habits, especially EBF of mothers in West Pokot County.

Another study by Rana *et al.* (2021) looked at the effectiveness of breastfeeding support packages in Low- and Middle-Income Countries for infants less than six months of age. The study was a systematic review whose aim was to synthesize evidence on existing EBF interventions. Among all interventions, breastfeeding counselling and education support packages showed the most positive effect on breastfeeding practices (Rana *et al.*, 2021). The reviewed work helped the researcher to refine the necessary interventions to implement in the TBA-led initiative in West Pokot. Therefore, the study subsequently assessed the effect of TBA-led interventions in improving breastfeeding habits of mothers in the study area.

Vilar-Compte *et al.*, (2021) undertook a systematic review of literature on breastfeeding at workplace and also reviewed literature on various interventions to promote breastfeeding at workplace among lactating working mothers. The results of the study showed that providing breastfeeding rooms and time-off encourages working mothers to breastfeed. Although in the present study most of the women involved were not in formal employment, the reviewed study helped to underscore the fact that efforts to encourage breastfeeding do actually work. This was valuable to the present study in examining the effect of TBA-led interventions in promoting breastfeeding among women in West Pokot County. A study conducted by Talukder *et al.* (2017a) in Bangladesh showed that interventions that engaged trained TBAs yielded positive results in early initiation of breastfeeding after birth. However, interventions that involved both TBAs and other community health volunteers, formal health care

providers and other community members like women groups within the community were more effective in enhancing breastfeeding among young mothers (Talukder *et al.*, 2017a). The reviewed work affirms that TBAs alone cannot be effective in promoting practice of EBF among mothers. There is therefore the need to incorporate efforts involving TBAs and other interested parties in the community. This is the approach that the current study adopted by developing, implementing and evaluating the effect of TBAs-led intervention to champion for the practice of EBF among women in West Pokot County, Kenya.

Another study in the same country of Bangladesh sought to establish the effect of socioeconomic inequalities on early initiation of breastfeeding and exclusive breastfeeding practices based on the country's 2018 Demographic Health Surveys. This study was based on a review of secondary data on early initiation of Breastfeeding (EIBF). The findings showed that children who were breastfed within the first one hour after birthing process, and exclusive breastfeeding estimated from children aged between 0-5 months were much healthier than those not breastfed properly (Ekholuenetale *et al.*, 2021). These findings underscore the importance of promoting healthy breastfeeding of children (exclusive breastfeeding for the first 6 months), which the current study sought to achieve in West Pokot County.

Oyelana *et al.* (2021) undertook a critical review of evidence on EBF in the sub-Saharan Africa. The study employed Roger's Diffusion of Innovation theory to explore innovation attributes affecting the practice of EBF in Africa. Data was searched from different databases and supplemented with another search from grey literature. Research findings showed that articles reviewed mainly focused on barriers to EBF in several countries in Africa. Key findings indicated that several attributes of EBF are incompatible with African traditional beliefs and cultural practices and thus becoming barriers to the practice of EBF (Oyelana *et al.*, 2021). The above work underlines the fact that EBF has been studied quite extensively in the region, meaning there is sufficient literature to support interventions that promote EBF. However, no such studies had been undertaken in West Pokot County, a gap that the present study sought to fill.

Dukuzumuremyi *et al.* (2020) in a study examined the knowledge, attitude and practices of EBF among mothers in East Africa. The study was based on a systematic review of peer-reviewed literature. It focused on mothers' knowledge, attitudes and practices related to EBF in a bid to suggest ways of improving the practice of EBF. In the study, 16 studies were reviewed. The findings indicated that most mothers had never heard of the term exclusive breastfeeding (EBF). However, majority practiced EBF. Less than half knew the duration to exclusively breastfeed a baby. A few strongly disagreed to initiate breastfeeding immediately after birth. Interestingly, about a half of the mothers mentioned that it was important to discard colostrum before initiating breastfeeding (Dukuzumuremyi *et al.*, 2020). From these findings, it is evident that most mothers are not fully informed on the practices entailed in EBF. As such, the present study sought to fill this gap by initiating interventions to facilitate knowledge, attitudes and practices of EBF among mothers in West Pokot County.

In another systematic review of qualitative studies from Sub-Saharan Africa (SSA), Ejie *et al.* (2021) examined the facilitators of and barriers to EBF practices. The study showed that maternal employment and knowledge of benefits of EBF served as barriers to and facilitators of EBF practices, respectively (Ejie *et al.*, 2021). The reviewed work underscores the need to balance granting working mothers sufficient leave to breastfeed their new-borns with proper education of mothers on the benefits of EBF. These were some of the aims of the interventions implemented in West Pokot County as part of this current study.

In Thailand, Thepha *et al.* (2018) investigated perceptions of Northeast Thai breastfeeding mothers regarding facilitators and barriers to 6 months EBF practice. This was a qualitative study. The results of the study showed that facilitators of EBF include mother's knowledge on EBF, mother's perceptions on EBF, maternal circumstances, family support and certain traditional foods. However, the barriers to EBF were found to include promotion of formula feeds, negative perception of EBF by some mothers and employment (Thepha *et al.*, 2018). The reviewed study was conducted in Thailand while the current study was undertaken in Kenya.

In Ghana, Ziblim *et al.* (2020) examined the family related factors influencing EBF in rural areas. This was an exploratory qualitative study. It was found that infant feeding and care is a family and not individual responsibility. As such, a family's knowledge, belief system and way of participation in infant care heavily influence how a mother can practice and sustain EBF. The study further established that, for intervention on EBF practice to succeed, family members need to be included (Ziblim *et al.*, 2020). The present study adopted this recommendation in designing interventions to promote EBF among mothers in West Pokot, Kenya.

In Nigeria, Joseph and Earland (2019) undertook a qualitative exploration of sociocultural determinants of EBF practices among rural mothers. What came out from the study was mainly information about when to initiate breastfeeding, determinants of how soon one can initiate breastfeeding, traditional new-born care practices, and the fact that motivation to sustain EBF practice was influenced by the obligation to perform traditional rites, and mothers' awareness of the benefits of EBF (Joseph & Earland, 2019). These factors were taken into consideration in the study in West Pokot, Kenya.

Another cross-sectional study in Nigeria conducted by Akadri and Odelola (2020) involved mothers attending ANC in two teaching hospitals. The study looked at the period of breast-feeding, initiation after birth and how long mothers breastfed their babies, and if there is any problem with breastfeeding (Akadri & Odelola, 2020). The findings revealed that most mothers who used hospital services, initiated and sustained breastfeeding for at least six months. First-time mothers struggled to abide by the teachings and recommendations on EBF. These findings show an association between the use of healthcare facilities at childbirth and the practice of EBF, an outcome that the present study sought to achieve in West Pokot.

Another study in Niger looked at correlates of EBF practices in rural and urban areas. This was a community-based cross-sectional study comparing EBF practices among mothers of infants aged below 7 months from the urban and those from the rural set-ups of Niger. The study findings showed that EBF was uncommon but those from the rural areas were practicing EBF slightly more than those mothers from urban areas. It also revealed that most mothers ceased EBF within one week after delivery (Hitachi *et*

al., 2019). The reviewed study was undertaken in Niger while the current study was done in Kenya.

Another study in South Africa looked at rates of EBF from 2010 to 2013. Data was obtained from the South Africa National Health Surveys, before and during the implementation of change in national breastfeeding policy for children aged 0-6 months. Findings showed improved practice of EBF during the intervention period, when the EBF policy was implemented (Jackson *et al.*, 2019). These findings attest that policy interventions do cause positive change in EBF practices. The current study thus sought to test the effectiveness of TBAs-led interventions in promoting EBF in West Pokot County.

In Malawi, Nkoka *et al.* (2019) studied the determinants of timely initiation of breast milk and EBF. This was a cross-sectional study. The results showed that despite importance of early initiation of breastfeeding, the rate of this practice remain low in many sub-Saharan African countries (Nkoka *et al.*, 2019). The study does not attempt to document the reasons for the low level of breastfeeding; neither does it suggest interventions to promote breastfeeding. Therefore, to fill the knowledge gap, the current study designed, implemented and evaluated the effect of TBA-led health education interventions to promote EBF among mothers in West Pokot County, Kenya.

Another study conducted by Mundagowa *et al.* (2021) investigated barriers to and facilitators of EBF practices in disadvantaged communities in South Zimbabwe. The study sought to identify maternal perception of barriers to and facilitators of exclusive breastfeeding in Gwanda District. The study used qualitative approach in data collection. It was found that family support, knowledge about EBF and maternal diet facilitated the practice of EBF. Meanwhile, poor infant feeding, ritualistic infant practices, hot climate, family conflicts and workload to mothers prevented mothers from practicing exclusive breastfeeding (Mundagowa *et al.*, 2021). The reviewed study does not provide interventions to eradicate barriers to EBF among mothers. Nevertheless, the reviewed study provided insight on barriers to and facilitators of EBF practices among women in remote environments, which helped the present study to design interventions to promote EBF practices in West Pokot, Kenya.

In Egypt, Gad *et al.* (2019) undertook a study to find out factors contributing to inadequate EBF among infants aged 0-6 months. This study was carried out in maternal and child health care setups and involved four different maternal and child health centres under the Ministry of Health (MOH), Mansoura City, Egypt. The study findings revealed that majority of the research participants were unaware of EBF practices and almost half of them never practiced EBF due to their workload (Gad *et al.*, 2019). The study by Gad *et al.* provides unique challenges hindering working women in urban environments from breastfeeding. This is in contrast with the current study which engaged women in rural environments, most of whom were not involved in formal employment.

In Ethiopia, Azeze *et al.* (2019) studied EBF practices and associated factors among mothers in Boditi town, Wolaita Zone. The cross-sectional study specifically assessed the prevalence and associated factors of EBF practice among mothers with infants aged 6-12 months of age. The study found the significant factors to include the birth attendant, utilization of postnatal care and breast problems. Mothers who were attended to by health care providers and utilized post-natal services were likely to practice EBF, with those who had breast problems having less prevalence of the same practice (Azeze *et al.*, 2019). The reviewed study emphasizes the importance of skilled birth care in promoting EBF, although the current study took a more comprehensive approach, engaging TBAs to lead in the promotion of EBF in West Pokot. The reviewed study also underlines a unique challenge that could hinder women from practising EBF, namely breast problems. Drawing insight from this previous research, current study provided interventions to help women in West Pokot to embrace EBF.

In Zanzibar, Khamis *et al.*, (2017) observed that initiation of breastfeeding is very high but it declines over time so that EBF is not sustained up to 6 months. The study found that more than half of the infants did not continue EBF for 6 months, and that EBF was supported by health care providers, social networks and community members. The study reported that there is yet no clear strategy to improve EBF in Zanzibar where EBF for 6 months is still low (20.8%). The reviewed work highlighted some key issues that were pertinent to the present study. First is the need to improve EBF for at least six months among mothers in the region. Second is the fact that EBF needs to be

championed by all, TBAs included, for it to be embraced fully by mothers. Therefore, in response to these issues, the current study developed interventions that were led by TBAs to promote the practice of EBF among mothers in West Pokot County of Kenya.

In Kenya, different studies have been carried out regarding EBF. (Wanjohi *et al.*, 2016) investigated the socio-cultural factors influencing breastfeeding practices. The study established that some socio-cultural beliefs hindered EBF, such as the belief that colostrum is dirty or curdled milk, a curse or bad omen and that breastfeeding is associated with sagging of breasts. The study proposed interventions promoting behaviour change with regard to breastfeeding, which should focus on dispelling the beliefs and practices that result to suboptimal breastfeeding practices and involve spouses and other family members. Taking a cue from this recommendation, the current study designed, implemented and evaluated the effect of TBA-led interventions to promote EBF and the uptake of skilled birth services by mothers in West Pokot County.

Mohamed *et al.* (2020) conducted a cross-sectional study in Wajir County to compare the EBF rates amongst primiparous and multiparous mothers with children aged below 6 months old attending Wajir County Hospital. The study found no disparities in the practice of EBF between the two groups of mothers. Furthermore, a general finding was that, mothers were highly knowledgeable on and had positive attitudes towards EBF. However, the practice of EBF was below par, which was attributed to cultural barriers, perpetuated by mothers-in-law and TBAs. The mothers mentioned for instance the notion that new-borns need water to survive, not just breast milk. On a positive note, the study found that Islamic religion, formal sensitization and support from health care providers and husbands contributed to the uptake of EBF (Mohamed *et al.*, 2020). The above study showed that despite sensitization on the benefits of EBF, culture remains a strong force among the barriers to the practice of EBF. As such, the present study took the approach of involving TBAs to champion for EBF practices in West Pokot as a means of circumnavigating the challenge of cultural beliefs.

In Baringo County, Kimani-Murage *et al.* (2021) examined the realities and challenges of breastfeeding policy in the context of HIV. This was a qualitative study that explored community perspectives on facilitators and barriers related to breastfeeding on the said

group of mothers. This study revealed that counselling of mothers at the health facility, desire to have a healthy child and benefits associated with EBF practice encouraged mothers to practice EBF. Conversely, inadequate information about EBF, fear of transmission of HIV from mother to baby, and cultural practices were found to hinder mothers from practicing EBF (Kimani-Murage *et al.*, 2021). Clearly, HIV-positive status of the mother poses a unique challenge to the practice of EBF. The issue at hand is lack of knowledge among mothers on whether or not a child can contract HIV through breastfeeding. Therefore, the current study adopted education or sensitization approach in implementing interventions to promote the practice of EBF in West Pokot.

Mbogori (2022) investigated the relationship between place of birth and type of birth attendant with breastfeeding practices of children in Kenya. The study relied on analysis of secondary data from the Kenya Integrated Household Budget Survey (KIHBS) of 2015/2016. The findings revealed that the choice of birth attendant positively related with the place of birth. Therefore, the researcher proposed that interventions should delineate and eradicate factors that prevent mothers from giving birth in hospitals or facilities where child health education was available (Mbogori, 2022). Taking a cue from his recommendation, the current study developed interventions led by TBAs to promote the use of skilled birth services by mothers in West Pokot County.

In summary, many studies have reported on training of TBAs on birthing practices and infection prevention. Little has been done on their effect of interventions for promotion of the practice of Exclusive Breastfeeding. This is the knowledge gap that the current study sought to fill. The study designed implemented and evaluated TBA-led health education interventions for improving EBF among lactating mothers in the County of West Pokot. The interventions were championed by TBAs because it was realized that most mothers preferred TBAs assisted baby deliveries in the County.

2.3 Traditional Birth Attendants' Influence on use of Modern Postpartum Family Planning Methods

According to the results of the 2015 revision of world population prospects, total fertility rate is now 2.5 children per woman globally. This global average masks wide differences, and Africa remains the region with highest fertility at 4.7 children per

woman. Europe has the lowest fertility of 1.6 children per woman, whereas the Caribbean islands have total fertility of 2.2 children per woman (UN, 2015). Research evidence shows that family planning (FP) is a cost-effective public health intervention with the potential of reducing both maternal and child mortality. However, worldwide, about 222 million women have an unmet need for FP, with the majority of them living in low- and middle-income countries (LMICs), who report an unmet need for postpartum family planning (Wanjohi *et al.*, 2016; Blazer & Prata, 2016).

While family planning is important in couple's reproductive life, Postpartum Family Planning focuses on the prevention of unintended and closely spaced pregnancies through the 1st 12 months following childbirth. It is intended to assist women decide on the contraceptive they want to use, initiate that contraceptive method and to continue its use for two years after delivery of a baby or more depending on contraceptive intentions of the woman or couple (WHO, USAID & MNCHP, 2013).

According to United Nations, (2017), in SDG Report 2017, preventing unintended pregnancy through universal access to modern family planning is critical to further improvements in the health and well-being of women of child bearing age. Based on estimations in 2017, 78% of girls and women of child-bearing age (15-49 years) worldwide who are married, or in a union have their needs for family planning satisfied through modern contraceptive methods. Offering modern contraception services as care provided during childbirth increases postpartum contraceptive use and is likely to reduce both unintended pregnancies and pregnancies that are too closely spaced, which are a public health concern because they are associated with increased maternal, newborn and child morbidity and mortality (USAID, 2017).

The requirement by WHO is that, after a live birth, the interval before attempting the next pregnancy should be at least 24 months; this is in order to reduce the risk of adverse maternal, perinatal and infant outcomes. Despite this, 61% of women are not using effective contraception within 24 months post-partum to avoid unintended pregnancies (USAID, 2017). Blazer and Prata (2016) recommend that policies, programmes and the FP research schedule should focus on postpartum women. By targeting this period alone, PFP prevalence could increase substantially in low- and middle-income

countries. Additionally, male partner involvement, integration with other service delivery platforms, such as PMTCT and immunization, may increase knowledge and uptake, and decrease pregnancy rates during the postpartum period. This recommendation inspired the current study to design, implement and evaluate comprehensive interventions to promote PPFp uptake among mothers in West Pokot County, Kenya.

Various studies have been conducted focusing on the state of and interventions to promote the use of modern Postpartum Family Planning by mothers. For instance, in Pakistan, Mariyam *et al.* (2021) explored the role of social network in decision making to increase uptake and sustainability of use of long-acting reversible methods of modern family planning. Similarly, in the same country of Pakistan, Ishaque *et al.* (2021) investigated determinants of postpartum family planning use in Sindh and Punjab provinces. Both of these studies found that number and child's gender had a lot of influence on uptake of PPFp use, so that those who had four sons and above were more likely to use modern family planning methods. Social networks and religion greatly influenced the choice of family planning methods to be adopted.

Gahungu *et al.* (2021) undertook a systematic review literature from the sub-Saharan Africa to evaluate the unmet needs of postpartum family planning among women in the region. The study assessed factors affecting the unmet needs and reasons for non-utilization of modern contraceptive methods during the postpartum period. The study identified the factors that affected the unmet need for non-utilization for family planning to include fear for the perceived side effects, husband's disapproval, being in amenorrhoea state after delivery and abstinence. These findings helped the current study to formulate TBAs-led health education intervention to promote uptake of postpartum family planning in West Pokot County.

Hoyt *et al.* (2021) carried out a qualitative study on integrated family planning and childhood immunization services in five African countries. They explored women's choices and decision-making around modern contraceptive methods (MCM) use and examined whether integrating family planning services with childhood immunizations influenced women's perceptions of, and decision to use, a modern contraceptive

method (Hoyt *et al.*, 2021). The results of the study revealed that most women desired to space up births as they were knowledgeable on the health benefits of such family planning. However, most of them could not use modern contraceptive methods (MCM) due to fears of perceived side effects, social stigma, and disapproval from male spouses. The reviewed study provided insight on the prevalence and the obstacles to use of postpartum family planning, which helped the current study to refine the TBAs-led health education interventions implemented in West Pokot County.

Another study in Ghana by Agula *et al.* (2022) examined the state of contraceptive use among low-income urban women in Accra at 1st, 3rd, 6th and 12th month after delivery, and the modern contraceptives used. The study also examined the predictors of modern contraceptive use in the 1-year postpartum period. The data was collected from a cross-sectional survey conducted in 2018 among women of childbearing age who reported to have delivered their baby in the past 13-31 months prior to data collection of the study. The study findings revealed half of the respondents were not on any modern family planning method. Those who were using family planning relied mainly on traditional methods. However, the findings further showed a negative association between postpartum modern contraceptive uptake and higher education, having more life births and being currently in a union (Agula *et al.*, n.d.). These various factors helped the current study to develop, implement and evaluate TBA-led health education interventions to enhance family planning uptake among mothers in West Pokot County.

Kaysin (2020), in a study done in Benin, explored the scope of practices of TBAs in the rural part of the country. The study found out that TBAs perform different health preventive and promotion activities, including antenatal and child health care, promotion of family planning and child immunization. The study also confirmed that rural communities mainly rely on this cadre for diverse health care services. It is from such findings that the present study assigned great agency to TBAs in leading interventions to promote uptake of PPEP in West Pokot County. The rationale was that TBAs are trusted more than are skilled health care providers.

Another study undertaken by Toan Tran *et al.* (2022) examined barriers to and facilitators of postpartum family planning in Burkina Faso and Democratic Republic of Congo. The study found the perceived facilitators to be negative traditional views on the effects of closely spaced children and negative effect the same has on the mother's health (Toan Tran *et al.*, 2022). The barriers reported included absence of male involvement, misconceptions about modern methods of FP, advocacy for abstinence especially among religious groups, among others. The current study sought to test if such beliefs were also at play in West Pokot County, Kenya.

In Nigeria, Odetola and Salmanu (2021) studied the factors influencing maternal health choices among women of reproductive age in Hausa communities in Ibadan. This was an exploratory cross-sectional study that employed mixed methods. The findings of this study revealed that majority of the women were aware of modern family planning methods, and slightly below a half were on the family planning methods (Odetola & Salmanu, 2021). The reviewed study was undertaken in Nigeria in a relatively metropolitan Hausa, Ibadan, while the current study was undertaken in Kenya, specifically in the largely rural part of West Pokot County.

In Rwanda and Burundi, Rutaremwa and Kabagenyi (2018) examined PPFP utilization focusing on analysis of population-based cross-sectional data from demographic health surveys conducted in 2010 that involved a sample of women from both countries. The study carried out descriptive and multivariate logistics regression analysis to draw comparison of the various predictors of utilization of modern family planning methods after mothers deliver their babies in these countries. The findings revealed that the use of modern PPFP was significantly associated with higher level of education in both Burundi and Rwanda (Rutaremwa & Kabagenyi, 2018). The current study adopted these findings to explore how education of mothers plays a role in promoting uptake of PPFP in West Pokot County.

A study in Ethiopia investigated postpartum family planning utilization among postpartum women and the associated factors in the public health institutions of Berhan and Debre towns (Demie *et al.*, 2018). The results of the study revealed that most women were knowledgeable about family planning and a significant number of them

practiced PPFP. Key determinants of use or non-use of modern Postpartum Family Planning method included need to resume sex within the first six months after birth and return of menses. The reviewed study was conducted in Ethiopia while the current study was done in West Pokot, Kenya. The reviewed study cites factors shaping PPFP but does not propose interventions to improve women's use of modern PPFP methods. To fill this gap, the current study proposed, implemented and evaluated TBAs-led health education interventions to promote modern PPFP usage among women in West Pokot County.

In East Africa, a qualitative study by Lee (2021) investigated the barriers to using modern contraceptive methods among rural young married women in Moshi rural District and Kilimanjaro region in Tanzania. The study utilized in-depth and key informant interviews. This study found barriers to uptake of modern family planning methods to include fear of health side-effects, rumours and misleading concerns from friends and village members, and elders' negative perception of men on family planning and especially those using condoms (Lee, 2021). Drawing insight from the reviewed study, the current research was cognizant of the general low knowledge of PPFP in the largely rural West Pokot County, Kenya. Therefore, the study developed and implemented interventions that were led by TBAs to promote the uptake of PPFP among women in the County.

A study by Willcox *et al.* (2021) in Uganda sought to understand couples' views on use of modern postpartum family planning methods and the perceived barriers to and facilitators for antenatal counselling on PPFP. The study found that antenatal couple's counselling has the potential to facilitate agreement on the use of modern PPFP. However, some male partners are reluctant to attending the modern PPFP counselling (Willcox *et al.*, 2021). These results showed that gender does play a role in some communities concerning decisions to use or not use PPFP. As such, it was important in the current study to examine the role played by TBAs in the uptake of PPFP in West Pokot County. In Kenya, Moon *et al.* (2021) examined the determinants of modern contraceptives prevalence and unplanned pregnancies in Migori County. This was a retrospective cross-sectional study that utilized survey data to estimate prevalence, use of contraceptives and unwanted pregnancies in the study population, and to investigate

the potential role the different factors play in meeting related family planning targets (Moon *et al.*, 2021). The study found that a significant proportion of the women used some sort of contraceptive, although unplanned pregnancy was still prevalent among a good number of the respondents. The researchers propose the need for family planning interventions to focus on highest risk factors contributing to unplanned pregnancy. The current study was partly inspired by this recommendation to design, implement and evaluate TBAs-led health education interventions to promote the use of modern PPF in West Pokot County, Kenya.

The FP 2020 is a global partnership that supports the right of women and girls to decide freely for themselves whether, when and how many children they want to have. In Kenya, the mandate to implement FP 2020 rests with the National Council of Population and Development (NCPD). However, there is no implementation plan for the same. The Kenya government committed to increase contraceptive prevalence from 46 to 56% by 2015. NCPD and the Department of Reproductive Health (DRH) further committed to engage donors on the Kenya's commitment in accelerating access to FP. This brought the needs to make the advocacy efforts for additional FP resources that have been in indeterminate state since the formation of the group in 2012.

A study carried out by the Kenyan Government FP Programme in West Pokot and Kwale Counties identified more than 10 policies underscoring the importance of Family Planning efforts by investing more Family Planning programmes. However, these policies are not well implemented due to low funding. The study revealed that women from the communities in the two counties would like to plan pregnancies but are not using any modern Family Planning methods because the facilities offering these services are far away from their villages (GoK 2014). The Kenya Reproductive Health (RH) policy is said to promote community-based distribution of Family Planning to expand access of Family Planning. There is even approved distribution of injectable in marginalized areas. However, key informants with policy makers and programme implementers in Family Planning and Reproductive Health reported that the programme has not succeeded, because of reluctance by nurses to implement the strategy, and lack of resources to fund community strategies such as providing incentives to Community Health Workers (CHWs). The current study sought to

address the lacuna in Reproductive Health policy implementation with respect to modern Postpartum Family Planning usage in West Pokot County. The study thus adopted a TBA-led health education interventions strategy to promote the uptake of PPFP in the County.

Another study in Kenya has looked at the demand satisfied by modern contraceptives among married women of child-bearing age. The study used performance monitoring and accountability 2020 (PMA, 2020) survey data from 2014-2018, which are cross-sectional survey studies involving women aged 15-49 years of age (Gichangi *et al.*, 2021). A similar study investigated contextual factors associated with contraceptive utilization and unmet need among sexually active unmarried women between 2014 and 2019. The study analysed data from PMA survey in Kenya, a nationally representative survey of female respondents to understand the level and contextual factors for family planning utilization and unmet need within female sub-groups including married, unmarried sexually active and unmarried with less recent sexual intercourse (Nemser Id & Addofoh, 2022). The two Kenyan studies concluded that unmarried women with less recent sexual intercourse, exhibited significantly different contraceptive utilization, unmet need and recent emergency contraceptive use. It was therefore important to understand and address the difference that marriage makes in decisions to use of modern PPFP among women in West Pokot County.

In West Pokot County, a study by Butto and Mburu, (2015) examined the male factors associated with the use of modern family planning methods. The study involved 266 married males. Almost half (48%) of the respondents said they were not involved in decisions to use family planning. Meanwhile, a paltry 6% of the men used family planning method. The factors associated with male involvement in family planning decisions included education, age, number of children, type of marriage, knowledge and ease of use of a family planning method. The current study also considered male involvement in family planning decisions an important variable. Therefore, the TBAs-led interventions proposed, implemented and evaluated took into account the male roles in PPFP uptake in West Pokot County.

Interventions by the Kenya government, aimed at providing counselling to mothers by Community Health Workers (CHW) regarding FP have not yet yielded the required results. This assertion is justified by the fact that, the use of modern contraceptive services in the County is still very low, standing at 14.2% (World Vision International, 2017). Despite TBAs playing a key role in MNCH issues and evidence showing that most mothers in this County prefer them, not much scholarly attention has been given to the role of TBAs in advocacy of modern Family Planning services. This is the gap in knowledge that the current study sought to fill in seeking to find out the effect of TBAs-led health education intervention on the use of modern family planning methods during mothers' postpartum period in West Pokot County.

2.4 Traditional Birth Attendants' Influence on Infant Vaccination Coverage

Immunization is one of the most cost-effective public health interventions to date, saving millions of lives and protecting countless children from illness and disability. As a direct result of immunization, polio is on the brink of eradication globally. Deaths from measles, a major child killer disease, declined by 79 percent worldwide and by 85 percent in the sub-Saharan Africa between 2000 and 2015. As of March 2017, 41 of 59 priority countries had eliminated maternal and neonatal tetanus (UNICEF, 2018).

Immunization coverage for the six major vaccine-preventable diseases, namely pertussis, childhood tuberculosis, tetanus, polio, measles and diphtheria, has risen significantly since the Expanded Programme on Immunization (EPI) began in 1974. The percentage of children receiving diphtheria, tetanus and pertussis (DTP) containing vaccine is used as an indicator of how well countries are providing routine immunization services (UNICEF, 2018).

Global coverage for three doses of DTP increased from 21 percent in 1980 to 72 percent in 2000 to an estimated 86 percent by 2016. Nevertheless, global coverage of three doses of DTP has slowed down during the current decade, and immunization has not yet realized its full potential. This trend falls short of global immunization targets of the Global Vaccine Action Plan (GVAP), for the Decade of Vaccines of achieving 90% or more DTP3 vaccination coverage at the national level and 80% or more in all districts in all countries by 2015 (UNICEF, 2016; WHO, 2016).

A study conducted by Boyle *et al.* (2020) in the United States of America looked at parents' immunization beliefs, intentions and behaviours using smartphone panels. The study described parental immunization beliefs, intentions and behaviours and assessed the relationships between beliefs and intentions regarding child immunization and actual behaviours, as well as whether beliefs, intentions or behaviours varied across demographic subgroups. The study findings showed that demographics closely associated with immunization behaviours were respondents' level of education and household average income. There was also a strong agreement that vaccines are effective, important to communities' and children's health (Boyle *et al.*, 2020).

Bassoum *et al.* (2020) undertook a study across the sub-Saharan Africa to determine coverage and timeliness of birth dose vaccination in the region. This was a systematic review and a meta-analysis study conducted to estimate the coverage rate of three vaccines recommended by WHO to be given to children immediately after birth, which included BCG, OPV-zero and a birth dose of hepatitis B vaccine (HepB-BD). The researchers searched for studies conducted in the SSA region and published March 31 2017 which provided a coverage rate of the birth vaccines in any specific time points within twenty eight days after birth (Bassoum *et al.*, 2020). The results of the study revealed that the level of vaccine coverage immediately after birth were quite low for BCG and HepB-BD, and no data on OPV0. The researchers recommended the need for additional data to better define barriers and facilitators for the timely administration of the birth vaccines in sub-Saharan Africa, since the delay in its provision may increase the burden of these vaccine-preventable diseases. The aim of the current study was to add to existing data as recommended above.

Munk *et al.* (2019) undertook a systematic review of studies from LMIC to explore the costs and effectiveness of interventions to increase infant vaccination coverage in these countries. The study reviewed both published and unpublished research reports. The researchers evaluated the quality of studies and extracted data on costs and incremental cost-effectiveness ratios to describe the efficiency of each intervention in increasing vaccination coverage (Munk *et al.*, 2019). The findings revealed that interventions implemented to increase vaccination coverage included demand generation, modified delivery approaches, cash incentives and strengthening of health systems. Majority of

the studies indicated positive results in the aftermath of those interventions. The reviewed study attests that interventions do bear results when properly designed and implemented. However, since the study relied on secondary data, it was important to provide empirical data involving actual implementation and evaluation of programmes in the field, which the current study sought to realize in West Pokot County, Kenya.

A study by Church *et al.* (2019) investigated interventions to increase oral vaccination efficacy or immunogenicity. The researchers searched OVID-MEDLINE and Embase for trials published 2017 and carried out a random-effects meta-analysis to produce summary relative risk estimates (Church *et al.*, 2019). From the results of the study, most interventions, such as delaying RVV and reducing OPV, did little to enhance oral vaccine performance. The researcher recommended the need for novel interventions to enhance the effectiveness of oral vaccines. In light of the findings, the current study sought to implement interventions to enhance the uptake and efficiency of vaccines in West Pokot County.

In their study, Jalloh *et al.* (2020) examined best lessons from social mobilization as a strategy to promote child immunization in low and middle-income countries. The first example focused on Sierra Leone's routine immunization programme during the Universal Child Immunization initiative in the late 1980s. The other looked at India's establishment of a social mobilization network in the years of early and mid-2000s to support eradication of polio in high-risk communities, with the researchers highlighting the complexities of social mobilization in a humanitarian emergency during the 2017-2018 diphtheria outbreak among displaced Rohingyas in camps and settlements in Bangladesh (Jalloh *et al.*, 2020).

In Nigeria, Etokidem *et al.* (2021) looked at the potential barriers to and facilitators of civil society organization engagement in improving immunization coverage in Odukpani local government area across River State. This was implementation research that employed qualitative approach. The results revealed that the civil society organizations encountered various barriers in the course of their immunization advocacy, including communication and social mobilization due to male child prevalence, who are then shielded and not taken for immunizations (Etokidem *et al.*,

2021). The above study was undertaken in Nigeria, although it offers insight to the current intervention study undertaken in Kenya.

Another study from Nigeria by Mahachi *et al.* (2022) investigated contributing factors and interventions to overcome immunization service delivery challenges. The study conducted a scoping review to synthesize recent literature on risk factors and interventions for zero and missed dose children in Nigeria. The research identified several papers that were grouped into those on factors only and those on interventions. The study findings reported the most frequently reported factors, influencing childhood vaccination uptake were maternal factors, for example maternal education level and other challenges (Mahachi *et al.*, 2022). The reviewed study was helpful in developing unique interventions targeting mothers as key agents in children's health. However, the current study did not ignore the role of the entire family of the mother, including husbands or fathers and other community members like TBAs in promoting child immunization, and skilled birth care and other service usage in West Pokot County.

A study in Ethiopia done by Demissie *et al.* (2020) sought to establish whether community engagement strategy could increase uptake of routine child immunization and selected perinatal services in North West Ethiopia. The study evaluated the contribution the strategy had on child immunization and other MNCH strategies. The study findings showed that the strategy significantly improved the uptake of child immunization and other MNCH indicators and concluded that this strategy contributed to enhanced immunization performance, and increased utilization of immunization and selected perinatal health services in the study sites (Demissie *et al.*, 2020). This study underlines the fact that interventions do work in changing people's approach to skilled health care, which was one of the assumptions of the current study.

In South Sudan, Jil (2022) investigated immunization status of children aged 12-23 months in Jonglei State. This was a cross-sectional epidemiological study that also sought to identify the factors that contribute to low vaccination coverage in the country. The study found that less than half of the children were fully immunized as per the expanded programme on immunization schedules (Jil, 2022). However, the researcher noted a need to strengthen local community awareness on the benefits of immunization

of the specific age cohort of children. In keeping with Jil's recommendation, the current study sought to implement and evaluate interventions to enhance immunization of children in West Pokot County, Kenya.

In Kenya, a study by Masters *et al.* (2018) examined the socio-economic determinants and disparities in vaccination status of the children among the Somali ethnic group. The study utilized the 2014 KDHS and the proportion of non-vaccinated, under-vaccinated and not-vaccinated children. The study further assessed associations among different factors and vaccination status using multinomial logistics regression, in addition to the effect of Somali ethnicity (Masters *et al.*, 2018). In general, the study found a disproportionately low uptake of vaccination among the Somali ethnic group owing to their demographics. Specifically, it was noted that majority of the group resides in urban areas where vaccination reach is low. On the other hand, the current study sought to determine the effect of traditional birth attendants'-led health education intervention on child immunization in West Pokot County.

Another study in Kenya done by Stoffel *et al.* (2020) sought to establish whether iron deficiency anaemia at the time of vaccination predicts reduced vaccine response and iron supplementation at time of vaccination increases humoral immune response. This was a birth cohort study among Kenyan infants (Stoffel *et al.*, 2020). The results indicated that in Kenya anaemia and iron deficiency during vaccination period reduced the reaction to diphtheria, pertussis and pneumonia vaccines. The study recommended the need for iron supplementation during the period of vaccination. The current study recognized the need to educate mothers in a persuasive way on such health issues as vaccination efficacy. Therefore, the study adopted a TBAs-led health education intervention to promote proper vaccination of infants in West Pokot County, Kenya.

Another Kenyan study by Ochieng *et al.* (2020) investigated whether maternal HIV infection can be a risk factor for delayed or missed infant measles vaccination in Western Kenya. The study assessed the effect of a mother's HIV status on a child's overall uptake of measles vaccine and timeliness. The study used data from a health and demographic surveillance system and longitudinal bio-behavioural survey. The findings of the study did not reveal any association between mother's HIV status and

child's vaccination with the measles vaccine (Ochieng *et al.*, 2020). Therefore, maternal HIV-positive status was not a significant factor in uptake of child vaccination. The current study considered HIV variable only with respect to uptake of EBF and not vaccination.

Pertet *et al.* (2018) in a study in Kenya, examined child immunization uptake with respect to geographic mobility, social demographics or missed opportunities among the Maasai community. This study found no significant association between social demographics and under-vaccination. However, it found a positive association between movement of the whole family, lack of vaccines and location of health facility and under-vaccination. These factors were found to contribute to low vaccination levels on children aged 2 years and below in this community (Pertet *et al.*, 2018). The residents of West Pokot also tend to parallel the lifestyle of the Maasai, characterized by constant movement. Therefore, the demographic features described in the reviewed study were pertinent in developing interventions to be implemented in West Pokot to promote vaccination of children.

Another study by Allan *et al.* (2021) investigated inequities in childhood immunization coverage to be associated with socioeconomic, geographic, maternal, child and place of birth characteristics in Kenya. The study found that children of mothers with no education, born in home settings, of higher birth order and living in poor households had lower rates of immunization (Allan *et al.*, 2021). The current study integrated these demographics in developing, implementing and evaluating interventions to enhance child immunization in the County of West Pokot.

Kipunaa and Lotulya (2022) carried out a study to establish the opinions of stakeholders on community health workers' (CHW/V) impact on child immunization uptake in Pokot South Sub-County of West Pokot County. Findings of this study revealed that majority of the community members knew and recognized the community health workers. However, slightly above a half of them were satisfied with the role played by the community health workers. Furthermore, community health workers/volunteers complained of poor support from the community (Kipunaa & Lotulya, 2022). The fact that community health workers are perceived positively in West Pokot County, inspired

the current study to develop and implement interventions championed by Traditional Birth Attendants. Therefore, the study implemented and assessed suitable interventions to help improve uptake of child immunizations in the County.

2.4.1 Gaps in Immunization Coverage

Among the 194 World Health Organization member states, 126 countries achieved and sustained the 90% immunization target for DTP3, up from 63 in 2000. Many of these countries, especially their national programmes, saw to it that coverage with all vaccines reached and are sustained at the 90% or more target (WHO, 2016). In 1974, the WHO established Expanded Program on Immunization to ensure all children have access to routinely recommended vaccines. Since then, global coverage with vaccines to prevent Tuberculosis, diphtheria, tetanus, pertussis, poliomyelitis and measles has increased from 5% to more than 85% and additional vaccines against hepatitis B, *Hymophilus influenza* type b (Hib), *streptococcus pneumoniae*, rota virus and Rubella have been included in vaccine recommendation introduced in multiple countries (Fieldstain *et al.*, 2016).

With massive global and national investments in vaccination programmes, there have been significant improvements in global childhood vaccination coverage. For example, the proportion of children who received the third dose of diphtheria-tetanus-pertussis vaccine (DTP3) by 12 months of age increased from 5% in 1974 to 86% in 2015 (WHO, 2016).

Several interventions have been put in place to improve the vaccination coverage of children. A study in China by Lichen *et al.* (2014) looked at the effect of mobile phone-based intervention, namely the use of smart phone applications to support village doctors and their effect on coverage of essential childhood vaccination. The study showed that leveraging mobile phone technologies to promote health has increased the reach and speed of uptake of child vaccination. The study was undertaken in China while the current study was done in Kenya. One of the disparities that stand out is that, unlike China, West Pokot County does not have the benefit of increased presence of smart phones.

In Africa, routine childhood immunization has been found to be one of the most successful and cost-effective health interventions that have considerably reduced child morbidity and mortality (Kazi, 2017). However, annually, many children below 1 year of age do not receive basic vaccination as part of EPI, and millions of them die from vaccine-preventable diseases. Reasons for this could be parents or caregivers who do not appreciate or who forget, or ignore the importance of immunization or completing the entire series of vaccines. As a result, there has been a continuation of polio epidemics, large measles outbreaks and high disease burdens of vaccine-preventable diseases in children (Kazi, 2017). These findings underline the importance of interventions to promote uptake of vaccination, which the current study sought to realize.

In Sub-Saharan African countries, where vaccine-preventable diseases are the major contributors to high child mortality and morbidity, vaccine timelines is crucial (Abdou *et al.*, 2017). In Kenya, the government has committed to improve its citizens' health by striving to provide health services that are easily accessible and meet the basic needs of the population. These services are provided at the backdrop of the Kenya Health Policy Framework (KHPF 1994-2010), the 2010 constitution and the Vision 2030 initiative. All these influences the structure in which health services are provided to improve health status of Kenyans. The present study sought to contribute to such efforts.

The 2010 constitution brought with it devolution of governance with 47 counties being tasked with provision and delivery of health care services in their jurisdictions. According to World Health Organization's guideline (2018), children are considered to have received all basic vaccinations, when they have received a vaccination against tuberculosis (BCG), 3 doses each of DPT, HepB, Hib and polio vaccines and vaccines against measles. The Kenyan immunization programme considers a child to be fully immunized if the child has received all basic vaccinations, namely BCG vaccine at birth, three doses of polio vaccine, 3 pentavalent (DTP3, Hb, Hib), also the pneumococcal vaccines given at age 6, 10 and 14 weeks, and measles vaccine given at 9 months of age (National Bureau of Statistics-Kenya and ICF International, 2015).

Mobile health and SMS-based interventions have successfully improved vaccination uptake in children in LMIC. In Kenya, a study has shown that there is a statistically significant effect of mobile phone-based incentives with SMS for improving immunization coverage and timelines in LMIC setup (Kazi, 2017). Another study by Nzioki *et al.* (2017) in Mwingi West Sub-County, showed that community health strategy of using CHWs-led intervention improved immunization uptake in the intervention site. These studies show that interventions do work, hence the efforts made in the current study in West Pokot County.

In West Pokot County, immunization coverage stands at 31%, which is quite low compared to the national coverage of 79% (National Bureau of Statistics-Kenya and ICF International, 2015). This is an indication that much needs to be done to raise the coverage and reduce child morbidity and mortality caused by vaccine-preventable diseases in the County. Not much is documented about interventions carried out to improve vaccination coverage in West Pokot County. Many studies carried out in the County on the subject have included those on issues like utilization of essential immunization services among under five children (Alfred *et al.*, 2014), while other studies looked at factors influencing immunization uptake in the county.

With the high infant mortality of 81 deaths/1000 live births in the County, which could be due to vaccine preventable diseases, a suitable intervention that is context-specific was required to help raise vaccination coverage and therefore reduce these mortalities. TBAs being individuals within the community, well known and accepted by community members, stand a great chance of improving child immunization coverage in the County. This study, therefore, looked at the effect of making use of the available human resource within the rural Pokot community by investigating traditional birth attendants'-led health education intervention in promoting vaccination coverage in West Pokot County, Kenya.

2.5 Conceptual Framework

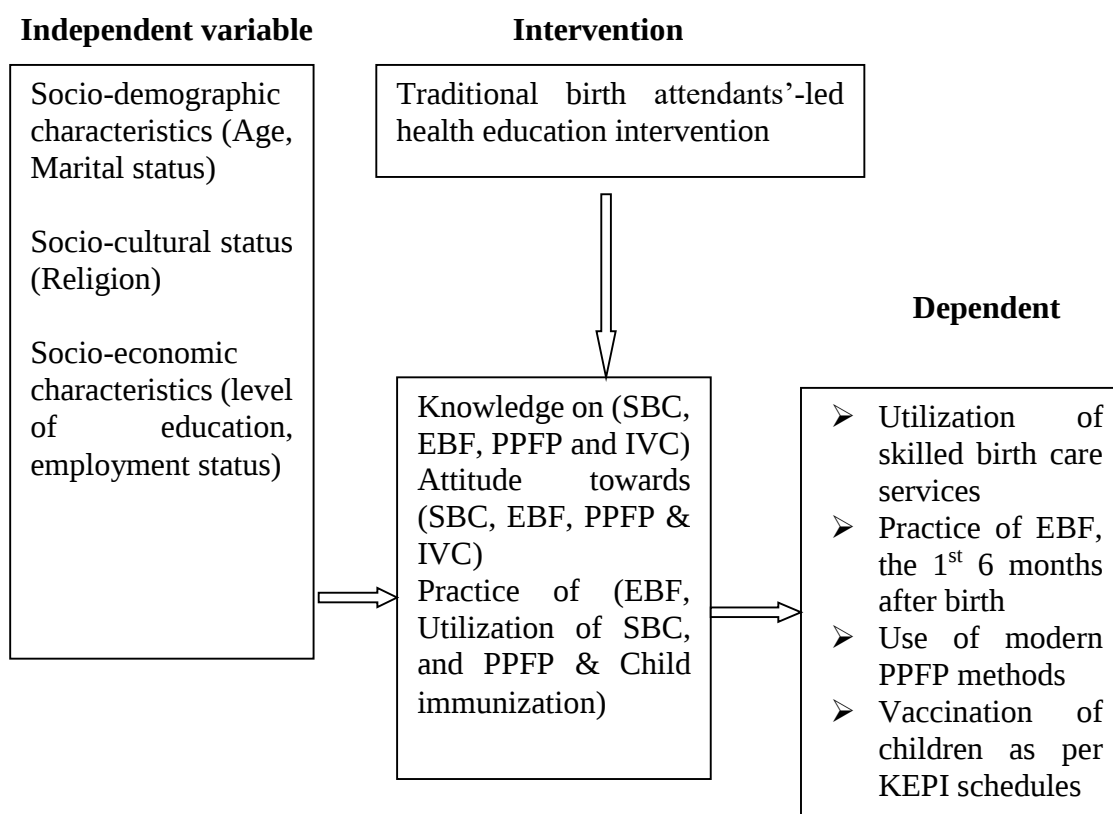


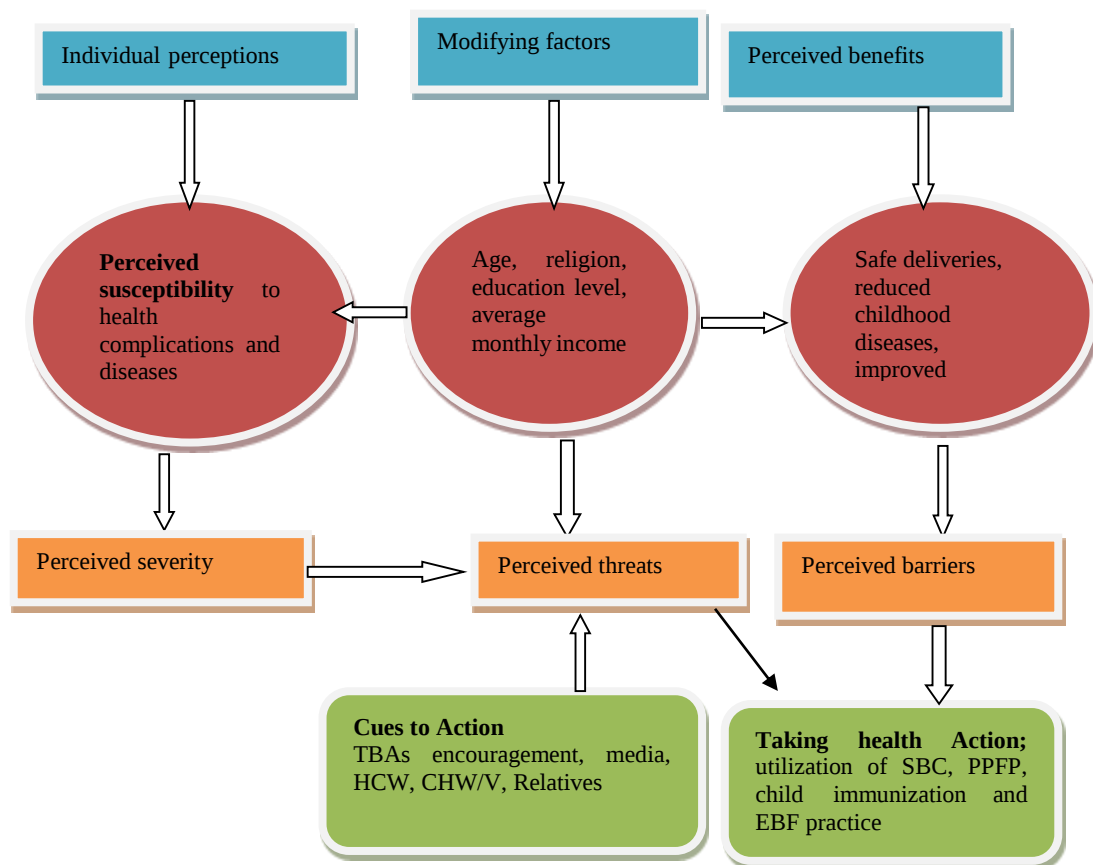
Figure 2. 1: Conceptual Framework

2.6 Theoretical Framework

The study was also guided by health belief model (HBM)

The health belief model is one of the health behaviour models, which is relevant when dealing with health behavior change. The Model states that people's beliefs influence their health-related actions or behaviours. According to the Health Belief Model, readiness to take action is based on the following conditions:

"I am susceptible to this health risk or problem, the threat to my health is serious. I perceive that the benefits of the recommended action outweigh the barriers or costs. I am confident I can carry out the action successfully and cues to action are present to remind me to take action." (Lisa Washburn)



Source: (Washburn, 2020), modification by Author, (2022)

Perceived susceptibility: This refers to a person's belief about their chances of getting a certain condition. For a person to take action, they must believe they are at risk for disease, illness or negative health outcomes. When people believe they are at risk for a disease or a certain negative health condition, they will be more likely to do something to prevent it from happening. In the case of the present study, this is the susceptibility to complications related to childbirth process, possible maternal and neonatal infections, infant health related disease conditions due to early weaning, health problems related to closely spaced pregnancies and the risk of child contracting vaccine preventable diseases.

Perceived severity: This refers to a person's belief about the seriousness or severity of a disease or certain negative health condition. Severity can be based on medical consequences, like death or disability, or personal beliefs about how the condition or disease would affect their life. For the case of this study, mothers, even having been informed of the risks related to home deliveries with help of unskilled birth attendants, may choose to neglect the health risks associated with such practice. The same applies to the situation where mothers choose not to practice EBF for the first 6 months after delivery of a baby and health benefits of exclusive breastfeeding-the first 6 months of life both for the mother and the baby, despite being informed of the health-related risks this will pose to the baby. The same applies to the health risks related to mothers not utilizing PPFP and children not fully vaccinated as per KEPI schedules

Perceived benefits: This refers to a person's opinion of the value or usefulness of a new behavior in lowering the risk of the health problem or disease. To make a change, people must believe that the change will have a positive result. For the case of this study, this refers to health-related benefit as a result of mothers utilizing Skilled Birth Care, practicing Exclusive Breastfeeding, utilizing modern PPFP and taking their children for vaccination as per KEPI schedules.

Perceived barriers: This refers to any obstacles to the behavior changes being considered to decrease risk. In the case of this study, it refers to conditions such as, ignorance to practices like Skilled Birth Care, Exclusive Breastfeeding, child immunization, postpartum use of modern family planning methods, spouse's disagreement for modern PPFP, poverty, long distance to health care facilities and low staffing in the nearby health care facilities

Cues to Action: Cues to action are events, people, or things that trigger people to change behaviour, they could be advice from others to practice or adopt certain behaviour. In this case it includes traditional Birth Attendants and others advising mothers to utilize Skilled Birth Care, practice Exclusive Breastfeeding, utilize modern PPFP methods and take their children for child immunization as per KEPI schedule in West Pokot County.

Self-efficacy: This is a person's confidence and belief in ability to take action or perform a given behaviour. People generally do not try to adopt new behaviours unless they believe they can do them. A person who thinks altering their behaviour is worthwhile (perceived benefit) but is unsure of their ability to make a change is unlikely to attempt behaviour changes. In other words, even if a person believes adopting healthier behaviours will have significant benefits, they are unlikely to change current behaviours if they doubt that the barriers to change can be overcome. Self-efficacy can be increased with encouragement, training and other support. For the case of this study, self-efficacy can be increased with encouragement from, trained health care providers, Traditional Birth Attendants, friends, relatives and other community members.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Study Area

The study was carried out in West Pokot County, one of the 47 counties in Kenya. The County is located in the former Rift Valley Province, precisely in the North Rift region along Kenya's western border with Uganda. It borders the County of Turkana to the north and northeast, County of Trans Nzoia to the south, Elgeyo Marakwet and Baringo Counties to the south east and east, in that order. The County lies in longitudes 34°47' and 35°49' East and Latitude 1° and 2° north.

The County covers an area of about 9,169.4 km² and its headquarters is at Kapenguria town. It comprises four sub-counties, namely West Pokot, Pokot Central, North Pokot and Pokot South (County Government of West Pokot, 2013). According to the 2009 Kenya Housing and Population Census, West Pokot County had a population of 512,690 and has an annual population growth rate of 5.09% (CRA, 2013). Currently, the population of the County is estimated at 613,231 people as per 2013 projections. This population consists of 313,746 males and 317,484 females, giving a sex ratio of 100:101, (County Government of West Pokot, 2013).

West Pokot County is predominantly a pastoral area. This is because there is insufficient rain in most parts of the County to support farming activities. The County has poorly developed infrastructure facilities apart from the Kitale-Lodwar road, which cuts through the County. The study involved two of the five sub-counties/constituencies, namely Pokot South (Kipkomo) and Pokot North Sub-Counties.



Figure 3.1: Map of Kenya, Showing Location of West Pokot County

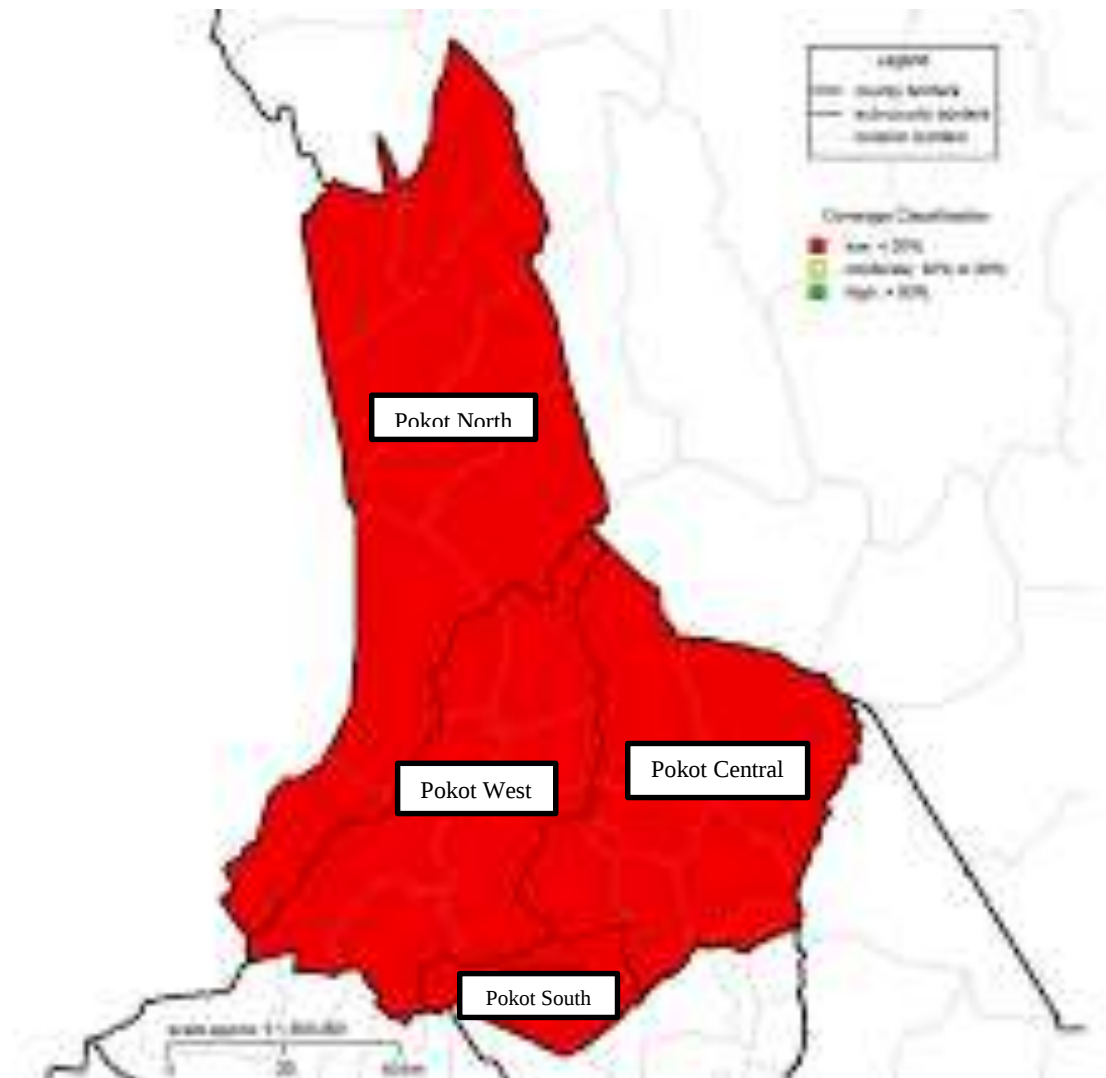


Figure 3.2: Map of West Pokot County, Sub-Counties and Density of Population

Source: (Kenya National Bureau of Statistics, 2010)

3.2 Study Design

This study employed a quasi-experimental design with two non-equivalent groups: an intervention group and a control group. A quasi-experimental design was chosen over a randomized controlled trial because randomization at the individual level was not feasible. TBAs and the expectant mothers who trust them naturally cluster within specific villages, and random assignment would have led to contamination between groups. Additionally, the study aimed to evaluate the intervention under real-world conditions to enhance the generalizability of findings to similar rural settings in Kenya.

The intervention and control groups were selected purposively at the sub-county level. Pokot South Sub-County was designated as the intervention site, where TBAs received training and delivered health education to expectant mothers. Pokot North Sub-County served as the control site, where no TBA-led intervention was implemented, and mothers continued to receive the standard Maternal, New-born, and Child Health (MNCH) services routinely provided by the Ministry of Health. These two sub-counties were chosen because they are geographically separated by considerable distance and difficult terrain, which minimized the risk of cross-contamination between study groups. Baseline data from the Kenya Demographic and Health Survey (2014) indicated that both sub-counties had comparable maternal and child health indicators prior to the intervention.

A baseline survey was conducted at the beginning of the study to assess participants' awareness of and intentions to utilize the four MNCH strategies (SBC, EBF, PPFP, and IVC). Following baseline data collection, the intervention was implemented in Pokot South Sub-County only. TBAs in the intervention site provided health education and advocacy to the expectant mothers assigned to them, following these mothers from pregnancy to delivery, and until their children were over the age of nine months old. Mothers in the control site received the usual standard care without any structured TBA-led health education. An end-line survey was then conducted after the children had reached the age above nine months, to assess actual utilization of the four MNCH strategies. Any baseline differences in socio-demographic characteristics between the two groups were statistically controlled for, during analysis using binary logistic regression. The total duration of the study from baseline recruitment to end-line data collection was approximately 15 to 18 months per mother-infant pair.

3.3 Intervention

3.3.1 Curriculum Development

The training curriculum for Traditional Birth Attendants (TBAs) in the intervention arm, was adapted from the Government of Kenya's Ministry of Health, Community Health Worker (CHW) Curriculum, 2013 version, specifically focusing on modules related to maternal, new-born, and child health promotion. These modules covered the

four key strategies of interest: Skilled Birth Care (SBC), Exclusive Breastfeeding (EBF), Postpartum Family Planning (PPFP), and Infant Vaccination Coverage (IVC). The decision to use the CHW curriculum as a foundation was deliberate and methodologically sound. At the time of intervention development between 2018 and 2019, Kenya had no formal, Ministry of Health-approved training curriculum specifically designed for Traditional Birth Attendants. The CHW curriculum represented the most authoritative, evidence-informed, and locally relevant national standard for community-level maternal and child health education. Adapting this existing framework ensured that the intervention content aligned with national health policies and guidelines, thereby enhancing the potential for future scale-up and policy integration if the intervention proved effective.

No single universal TBA training curriculum exists worldwide. The World Health Organization recommends that training programmes for traditional birth attendants be context-specific, culturally appropriate, and aligned with each country's national health strategies. Therefore, using Kenya's own nationally approved CHW curriculum as a base—rather than importing an externally developed "global" curriculum—is entirely consistent with WHO recommendations. This approach prioritizes local ownership, cultural relevance, and practical feasibility, all of which are essential for a quasi-experimental study, testing an intervention intended for real-world application in rural Kenya.

The customization process involved modifying the original CHW curriculum to suit the specific roles, literacy levels, and cultural context of TBAs in West Pokot County. This was done in consultation with two public health educators from JKUAT and one community health officer from West Pokot County. Several key adaptations were made. First, all training materials were translated into Kiswahili and simplified into oral formats supplemented with illustrations, since most TBAs had low literacy levels and written exercises were replaced with role plays and group discussions. Second, the scope of practice was deliberately narrowed: TBAs were explicitly not trained to conduct deliveries or provide any clinical care. Unlike CHWs, who may perform some basic clinical tasks, the TBAs in this study were limited exclusively to health education, referral, and accompaniment to health facilities. Third, culturally relevant examples and

case scenarios drawn directly from Pokot community life were incorporated; for instance, messages on child spacing were framed around enabling a mother to adequately care for both her children and her livestock. Fourth, strong emphasis was placed on referral pathways and recognition of danger signs, with TBAs instructed to refer all deliveries to health facilities rather than conducting any home deliveries. Fifth, all clinical procedures such as taking vital signs, wound care, and medication distribution were removed from the curriculum, as these fell outside the intended role of TBAs in this study.

To ensure content validity and appropriateness, the adapted curriculum was reviewed by a panel of experts consisting of two university-based public health specialists (who also served as supervisors for this thesis), one senior nurse-midwife from Kapenguria County Hospital, and one community health extension officer working in Pokot South Sub-County. Their feedback was incorporated to refine the curriculum further. Finally, a one-day pilot training session was conducted with five TBAs from a non-participating village in West Pokot County, none of whom were part of the main study sample. Based on observations and feedback from this pilot, minor adjustments were made to session timing and the clarity of illustrative materials. This rigorous process of adaptation and validation ensured that the curriculum was both scientifically accurate and culturally feasible for implementation in the study setting.

3.3.2 Recruitment of TBAs

Recruitment of Traditional Birth Attendants for the intervention arm was carried out with the assistance of administrative community and village leaders (chiefs and assistant chiefs) and community health workers or volunteers (CHWs/CHVs) in Pokot South Sub-County (the intervention site). These local leaders were asked to identify women who were actively practicing as traditional birth attendants within their communities, meaning they had assisted in at least five deliveries in the preceding 12 months prior to recruitment. This threshold was chosen to ensure that recruited TBAs had sufficient recent, active experience to be credible and influential among expectant mothers. No formal certification or licensure was required, as none exists for TBAs in Kenya.

Regarding basic education, the study did not mandate any minimum formal schooling level. This decision was made because the majority of older women serving as TBAs in West Pokot County have little or no formal education; requiring literacy would have excluded the very individuals whom the community trusts and utilizes. Instead, the study relied on the training curriculum described in section 3.3.1, which was deliberately adapted for low-literacy learners using oral instruction, pictorial job aids, Kiswahili translation, and role plays. During recruitment, each potential TBA was informally assessed by the research team for her ability to communicate clearly in Kiswahili or the local Pokot language, since health messages needed to be conveyed to expectant mothers. All TBAs who met the experience criterion and were willing to participate were enrolled, regardless of formal education.

In addition to experience and communication ability, eligible TBAs were required to be female (as is universal in this context), reside within the village unit where they would be assigned to work, and provide voluntary written or thumb-printed consent to participate. TBAs were excluded if they reported plans to leave the area within the study period (approximately 15 months per mother-infant pair) or if they were known to have been formally banned by the local community for unsafe practices. A total of 24 TBAs were recruited in the intervention site, with an average of 12 years of active delivery experience. Only three of the 24 TBAs had any formal schooling (two had incomplete primary education; one had completed primary school). The recruitment process continued until all expectant mothers in the intervention sample (n=204 at baseline) had been assigned to a TBA, with each TBA supporting approximately 8 to 10 mothers, depending on her availability and the geographic dispersion of households.

To ensure consistency, all recruited TBAs were then subjected to the same 40-hour training programme (described in section 3.3.3) before any health education activities began. No TBA was excluded after recruitment based on low training performance; instead, additional coaching and repetition were provided during the three-monthly support supervision visits to reinforce key messages. This approach recognized that practical, repeated guidance is more effective in low-literacy settings than one-time testing or exclusion.

3.3.3 Training of TBAs

Traditional Birth Attendants in the intervention site were given health education on Maternal New-born and Child Health promotion strategies/ practices in a one-week period of eight hours each day training (Appendix IV). The training was non-residential and at a central site in Kipkomo within Pokot South Sub-County. The training in the intervention group was done to sensitize Traditional Birth Attendants on the said Maternal New-born and Child health promotion strategies/ practices with the aim of improving their understanding and capacity to advocate for the same.

3.3.4 Formation of Village Units

Village units, which are the smallest administrative community units, were designated in the intervention and control study areas to enable support follow-up and observation purposes. These were the units from where the Traditional Birth Attendants operated within the intervention group.

3.3.5 Assignment of Traditional Birth Attendants to Village Units

For the intervention arm, the recruited Traditional Birth Attendants were assigned to the village units where they carried out the health promotion and education activities on the Maternal New-born and Child Health strategies, which included Skilled Birth Care, Exclusive Breastfeeding, Postpartum Family Planning and Infant Vaccination Coverage. These are their areas of residence.

3.3.6 Recruitment of Research Participants (Expectant Mothers in both Intervention and Control Sites)

Expectant mothers were recruited into the study with assistance from traditional birth attendants and community health volunteers in the intervention site, and from community health volunteers alone in the control site. Recruitment continued until the required sample size of 204 expectant mothers per group was achieved. To be eligible, mothers had to be self-reported pregnant, aged 15 to 49 years, and residing permanently in the selected sub-county. Those with chronic illnesses (such as hypertension, diabetes, HIV/AIDS, or tuberculosis) or those unwilling to provide informed consent were

excluded. In the intervention site, each recruited mother was assigned to a TBA known to her within her village unit. Mothers in the control site received standard Ministry of Health care with no TBA-led health education. All participants provided written or thumb-printed consent before enrolment.

3.3.7 Implementation of the Intervention: Traditional Birth Attendants provide Maternal, New-Born and Child Health Advocacy Services in the Intervention Site

In the intervention site, recruited expectant mothers received health education on the four maternal, new-born, and child health (MNCH) promotion strategies—Skilled Birth Care (SBC), Exclusive Breastfeeding (EBF), Postpartum Family Planning (PPFP), and Infant Vaccination Coverage (IVC)—delivered by their assigned Traditional Birth Attendants. The TBAs provided this education during routine home visits and community interactions, reinforcing key messages repeatedly throughout pregnancy and the postpartum period. Beyond education, TBAs actively followed up with each mother to ensure she delivered in a health facility under skilled care, practiced exclusive breastfeeding for the first six months, adopted a modern postpartum family planning method, and took her child for all immunizations according to the Kenya Expanded Programme on Immunization (KEPI) schedule, which includes BCG and polio at birth; polio, pentavalent, and pneumococcal vaccines at 6, 10, and 14 weeks; and measles vaccine at nine months.

TBAs continued to support each mother until her child had completed the full immunization schedule, after which the mother-child pair was considered to have completed the study. In the control site, mothers received the usual standard MNCH services provided by the Ministry of Health, with no TBA-led health education or follow-up. At the end of the intervention period, an end-line survey using a structured questionnaire and verification from the mother-child health booklet (purple book) assessed actual uptake of SBC, EBF, PPFP, and IVC in both groups.

3.4 Target Population

The target population for this study comprised all women of child-bearing age (15 to 49 years) residing in West Pokot County. According to records available at Kapenguria

County Hospital, the County has four sub-counties: West Pokot, North Pokot, Central Pokot, and Pokot South. The distribution of women in the target age group across these sub-counties was as follows: West Pokot Sub-County (16,666), North Pokot Sub-County (13,371), Central Pokot Sub-County (10,213), and Pokot South Sub-County (10,788). This gave a total target population of approximately 51,038 women of reproductive age in the County. From this population, the study drew its sample of expectant mothers from two sub-counties: Pokot South (intervention site) and North Pokot (control site).

3.5 Eligibility Criteria

Expectant mothers were eligible to participate in the study if they were self-reported pregnant, aged between 15 and 49 years, and resided permanently in either Pokot South Sub-County (intervention site) or North Pokot Sub-County (control site). Eligible mothers had no known underlying chronic health conditions such as hypertension, diabetes, heart disease, cancer, HIV/AIDS, or tuberculosis, as these could complicate pregnancy outcomes independently of the intervention. Mothers were excluded if they were unwilling to participate in the study for any reason or if they planned to relocate outside the study area before completing the follow-up period, which was approximately 15 months from enrolment to the child's final immunization. All eligible mothers provided voluntary informed consent, either in writing or by thumb print, before being enrolled into the study.

3.6 Sampling procedures

Two sub-counties were purposively selected for the study: Pokot South Sub-County served as the intervention site, while North Pokot Sub-County served as the control site. This purposive selection was based on the need to minimize contamination between the two groups, as the sub-counties are geographically separated with limited interaction between residents. Both sub-counties have similar demographic, socioeconomic, and cultural characteristics, making them comparable for the quasi-experimental design.

Traditional Birth Attendants in the intervention site were identified using a snowball sampling method. Village leaders and community health volunteers first identified an initial TBA, who then assisted in identifying other TBAs practicing within the same community. This process continued until no new TBAs were named. Recruited TBAs and community health volunteers then helped identify expectant mothers who met the eligibility criteria, forming the sampling frame. Using this approach, a total of 408 expectant mothers (204 in the intervention site and 204 in the control site) were enrolled into the study at baseline. The sampling frame in each sub-county consisted of all eligible expectant mothers residing within the selected villages, drawn from the estimated populations of 10,788 women of child-bearing age in Pokot South and 13,371 in North Pokot Sub-County.

3.6.1 Sampling Frame

The sampling frame included all expectant mothers residing in Pokot North (control arm) and Pokot South Sub-Counties-Kipkomo (intervention arm). The estimated population of women of child-bearing age in these Sub-Counties was 13,371 and 10,788, respectively.

3.6.2 Sample Size

The sample size was calculated using equation for comparative epidemiologic studies (Charan & Biswas, 2013).

$$n = \frac{2(Z_{\alpha/2} + Z_{\beta})^2 P(1 - P)}{(P1 + P2)^2}$$

Where:

n = Sample size per group

$Z_{\alpha/2}$ = Statistical constant = 1.96

Z_{β} = Power of the study = 80% = 0.84

P = Pooled prevalence $(P1 + P2/2) = 0.42 + 0.27/2 = 0.345$

P1=Prevalence in intervention group = 0.42

P2 = Prevalence in control group) = 0.27, the current SBC prevalence (KDHS, 2014)

The researcher expected the intervention to raise the uptake of skilled birth care by 15%

$$n = \frac{2(1.96 + 0.84)^2 \cdot 0.435(1-0.34)}{(0.42-0.27)^2} = 157.479 \approx 157 \text{ per group}$$

To account for potential loss to follow-up (attrition) over the study period of approximately 15 months (from pregnancy enrolment to child's final immunization at 9 months plus post-vaccination follow-up), an attrition rate of 15% was applied. This rate was chosen based on a review of similar community-based longitudinal studies of maternal and child health conducted in rural Kenya and other sub-Saharan African settings. For example, studies by Tomedi *et al.* (2015) in rural Kenya and Fotso *et al.* (2020) in Sierra Leone reported attrition rates between 12% and 18% for mother-child pairs followed for 12 to 18 months. The 15% rate used in this study is therefore conservative and empirically grounded, rather than arbitrary.

Applying 15% attrition: $157 \times 0.15 = 23.55 \approx 24$ additional participants per group. Thus, the adjusted sample size per group was $157 + 24 = 181$ participants.

However, the study team opted for a more conservative target of 204 participants per group to provide an additional buffer against unexpected losses due to the remote terrain, seasonal migration of pastoralist families, and potential difficulty in tracking participants. This final sample size also ensured adequate power for subgroup analyses. The total sample size at baseline was therefore 408 expectant mothers (204 in the intervention group and 204 in the control group).

n = expectant mothers per group (Total n=204)

Total sample size = 408 participants

3.7 Study Variables

3.7.1 Independent Variables

The independent variables were the socio-demographic, socio-cultural and socio-economic characteristics of the research participants.

3.7.2 Dependent Variables

The dependent variables were: uptake of SBC, practice of EBF for the first 6 months of an infant's life, uptake of modern post-partum family planning, and infant vaccination coverage as per KEPI schedules.

3.7.3 The intervention

This was the Traditional birth attendants'-led health education intervention, on the maternal, new born and child health care which they facilitated through advocacy for utilization of Skilled Birth Care, practice of Exclusive Breastfeeding, the use of modern Postpartum Family Planning and child immunization in the intervention group of the study.

3.7.4 Control variables

3.8 Data Collection

3.8.1 Data Collection Tools

Data was collected using structured researcher-administered questionnaires. The interviews took place either at the homesteads of the research participants or health care facilities (at the participants' convenience). End-line data was verified using mother and baby clinic booklet (purple book), to verify on the utilization and practice of the Maternal, new-born and child health promotion practices (SBC, PPFP, IVC and EBF).

3.8.2 Data Collection Procedures

The researcher first got approval from Moi University and Moi teaching and referral hospital's IREC and NACOSTI. Permission was also got from West Pokot County commissioner through the county education and health departments to carry out the study. A pre-intervention survey was then done which mainly involved recruitment of study participants in both control (Pokot North sub-County) and intervention site (Pokot south sub-County) of West Pokot County. This was done after each participant consented to voluntarily participate in the study. Research participants in the intervention site were assigned to TBAs usually known to them and who resided within their community health units or villages. The TBAs, while working with the research participants provided them health education on MNCH promotion practices/strategies as explained in section 3.3.7.

At the endline, after the children of the study participants were above one year of age, that is, when they had completed measles vaccine, data was collected using structured researcher-administered questionnaires. This was to confirm whether the study participants followed through with their earlier intentions on the various selected MNCH practices.

3.9 Study Reliability

To test the reliability of the research study tools, piloting was carried out in Pokot West Sub-County. The piloted data was subjected to Cronbach's alpha statistical test with a coefficient correlation (r) of more than 0.7. In this study, it was 0.75, hence it was considered reliable (as per Sigh, 2013). Redundant questions were discarded or refined as appropriate as proposed by Tavakol and Dennick (2011). The updated questionnaire after the pilot test was then used in the main study.

3.10 Study Validity

Validity refers to the extent to which an instrument measures what it purports to measure (Sekaran & Bougie, 2019). To ensure content validity, the questionnaire items were developed based on extensive literature review and the conceptual framework of

the study. Items were drawn from validated instruments used in previous studies on relevant previous studies (Munyasia & Waithaka, 2024; Ngware, 2025; Soirmi, 2024). Content validity was also assessed by seeking expert reviews from university supervisors and research specialists who evaluated whether the questionnaire items adequately covered all dimensions of the constructs. Their feedbacks were incorporated to improve the instrument.

Face validity was established through expert reviews. The questionnaire was submitted to supervisors and research experts in the field of community health. The instrument was also externally reviewed by an independent research ethics committee (Moi University/MTRH's IREC). Their feedbacks were incorporated to refine the instrument, ensuring that questions were clear, relevant, and appropriately worded. Construct validity was assessed through factor analysis during data analysis to confirm that the items load onto the expected constructs as per the conceptual framework.

3.11 Data Analysis and Management

Duly filled questionnaires from the study were coded and data entry was done in Epi-data version 3.1 (EpiData Association, 2000-2018) and exported to SPSS version 24 for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the socio-demographic characteristics of the participants and the baseline and end-line outcomes. The data analysis plan was organized according to the four specific objectives of the study.

3.11.1 Analysis for Specific Objective 1: Effect of TBA-Led Intervention on Utilization of Skilled Birth Care (SBC)

Categorical data on the place of delivery (health facility vs. non-health facility), attendance of antenatal care (yes/no), possession of a birth plan (yes/no), and reasons for choice of delivery place. Frequencies and percentages were computed to summarize the proportion of mothers in the intervention and control groups who delivered in a health facility, attended ANC, and had a birth plan. These were presented in tables and figures with 95% confidence intervals for the proportions.

On Inferential statistics, a Pearson's chi-square test of independence was used to determine whether there was a statistically significant difference in the proportion of mothers utilizing skilled birth care between the intervention and control groups. This test was appropriate because both the independent variable (group: intervention vs. control) and the dependent variable (SBC utilization: yes/no) are categorical variables. The chi-square test compares observed frequencies with expected frequencies under the null hypothesis of no association.

Binary logistic regression was then used to estimate the likelihood (odds) of SBC utilization associated with being in the intervention group compared to the control group. Unadjusted odds ratios (UOR) were first calculated. Subsequently, multiple logistic regression was performed to adjust for potential confounding variables, including maternal age, education level, religion, employment status, household income, and husband's education. This method was appropriate because the outcome variable (SBC utilization) is binary (health facility delivery = 1, home or other delivery = 0), and logistic regression allows for the estimation of odds ratios while controlling for multiple covariates simultaneously. The effect size was reported as odds ratios with 95% confidence intervals. A p-value of less than 0.05 was considered statistically significant.

3.11.2 Analysis for Specific Objective 2: Effect of TBA-Led Intervention on Practice of Exclusive Breastfeeding (EBF)

Categorical data on whether the mother practiced exclusive breastfeeding for the first six months (yes/no), timing of breastfeeding initiation (within one hour, after one hour, after 24 hours), and reasons for introducing other feeds before six months. Frequencies and percentages were calculated to summarize the proportion of mothers in the intervention and control groups who practiced EBF for six months, initiated breastfeeding within one hour of birth, and avoided pre-lacteal feeds. These proportions were presented with 95% confidence intervals. Pearson's chi-square test was used to compare the proportion of mothers practicing EBF between the intervention and control groups. This test was appropriate because both variables are categorical.

Binary logistic regression was employed to estimate the odds of practicing EBF associated with the intervention. Unadjusted odds ratios were calculated first, followed by multiple logistic regression to control for potential confounders including maternal education, parity, employment status, and household income. Logistic regression was appropriate because the outcome variable (EBF practice: yes/no) is binary. Odds ratios with 95% confidence intervals were reported. The large expected effect size (as suggested by baseline data showing very low EBF rates in the county) justified the use of logistic regression, which can handle large odds ratios effectively.

3.11.3 Analysis for Specific Objective 3: Effect of TBA-Led Intervention on Use of Modern Postpartum Family Planning (PPFP)

Categorical data on whether the mother was using a modern family planning method during the postpartum period (yes/no), type of method used (injection, implant, IUD, pills, condom, traditional method), timing of initiation (within six weeks postpartum or after six weeks), and barriers to use (husband disapproval, fear of side effects, cultural beliefs, etc.). Frequencies and percentages were computed to summarize the proportion of mothers using modern PPFP methods in the intervention and control groups. The distribution of specific contraceptive methods was also described using frequencies and percentages. Pearson's chi-square test was used to determine whether there was a statistically significant difference in the proportion of mothers using modern PPFP between the intervention and control groups. The chi-square test was appropriate for comparing two categorical variables.

Binary logistic regression was then performed to estimate the odds of modern PPFP use associated with the intervention. Unadjusted odds ratios were calculated, followed by multiple logistic regression to adjust for covariates including maternal age, number of living children, education level, and husband's approval of family planning. Logistic regression was appropriate because the outcome (PPFP use: yes/no) is binary and because the study aimed to estimate the strength of association while controlling for confounders. Odds ratios with 95% confidence intervals were reported.

3.11.4 Analysis for Specific Objective 4: Effect of TBA-Led Intervention on Infant Vaccination Coverage (IVC)

Categorical data on whether the child was fully immunized according to the Kenya Expanded Programme on Immunization (KEPI) schedule (yes/no), as well as immunization status at each specific time point (birth, 6 weeks, 10 weeks, 14 weeks, 9 months). Data were verified using the mother-child health booklet (purple book). Frequencies and percentages were calculated to summarize the proportion of children fully immunized in the intervention and control groups. Coverage at each immunization time point was also described separately. These proportions were presented with 95% confidence intervals. Pearson's chi-square test was used to compare the proportion of fully immunized children between the intervention and control groups. This test was appropriate for comparing categorical outcomes between two independent groups.

Binary logistic regression was employed to estimate the odds of full immunization associated with the intervention. Unadjusted odds ratios were calculated first. Multiple logistic regression was then performed to adjust for potential confounding variables including maternal education, religion, household income, and place of delivery. Logistic regression was appropriate because the outcome variable (full immunization: yes/no) is binary. Odds ratios with 95% confidence intervals were reported. Additionally, given that the outcome could also be analyzed as a count of vaccines received, the study also considered whether the proportional odds assumption would hold for ordinal logistic regression; however, the binary outcome (fully immunized vs. not fully immunized) was deemed more clinically meaningful for policy recommendations.

3.11.5 Overall Model Summary

To determine the overall effect of the TBA-led health education intervention on all four MNCH outcomes combined, a binary logistic regression model was fitted with the intervention group as the independent variable and the four MNCH strategies (SBC, EBF, PPFP, IVC) entered as predictors. The model summary, including the Cox and Snell R-squared and Nagelkerke R-squared values, was reported to describe the proportion of variance in the outcomes explained by the intervention. An R-squared

value of 0.552, for example, indicates that the intervention explained 55.2% of the variance in the combined outcomes, holding socio-demographic characteristics constant. This overall model was appropriate for summarizing the cumulative effect of the intervention across all four dependent variables.

3.11.6 Management of Missing Data

Missing data were handled by case-wise deletion for the chi-square analyses, as missingness was minimal (less than 5% for all key variables). For the logistic regression analyses, cases with missing data on any variable included in the model were excluded from that specific analysis. The number of missing cases was reported for each analysis. Binary logistic regression was used to estimate the likelihood of use of Maternal, New-born and Child Health promotion strategies (SBC, EBF, modern PPFP and IVC) between the intervention and control groups. The effect size was determined by use of odds ratios at 95% significance interval.

3.12 Dissemination of Study Findings

The findings of this study have been disseminated through multiple channels to ensure they reach both academic and non-academic audiences. For the scientific community, the results were published in peer-reviewed journals, with at least two publications focusing on the effect of TBA-led health education on skilled birth care and exclusive breastfeeding, respectively.

For policy and practice audiences, a summary report will be submitted to the West Pokot County Department of Health to inform local maternal and child health programming. Additionally, the findings will be shared with the Ministry of Health at the national level to contribute to ongoing policy discussions regarding the role of traditional birth attendants in Kenya's health system. Finally, the researcher will hold community feedback meetings in both the intervention and control sites to present the study results to the participating communities and traditional birth attendants, ensuring that those who contributed to the research benefit from the findings.

3.13 Ethical Considerations

To safeguard confidentiality, authorisation from the West Pokot County's ministry of health and ministry of education [Appendix IX] was sought before the researcher proceeded to the field for data collection. Recruitment of research participants was on voluntary basis. They were required to sign consent forms and those not able to do so were requested to give oral consent (Appendix III). As for those participants in the control site and other parts of the County other than the intervention site, they were not exposed to any health risk, since they were receiving the standard health care offered by the Ministry of Health as in the usual circumstances.

Participants were allowed to quit the study at any moment they so wished. In addition, the consent forms were kept under lock and key cabinet. The information collected was kept in a safe place (key and lock cabinet) only accessible by the researcher. No names of the respondents were mentioned or written anywhere on the data collection instrument.

For the Traditional Birth Attendants' change of role in the intervention site, the researcher advised community members during community gatherings, like the chief's barazas, to treat them as usual and even more with the new role of becoming promoters for the Maternal New-born and Child Health strategies. Above that, community members were to continue working with TBAs and giving them special compensation with whatever goods they had been giving such as goats, chicken, sugar and others.

Permission to carry out the study was sought from and given by the County Commissioner of West Pokot County through the Departments of Education and Health. The research proposal for this study was reviewed and approved by Moi University/Moi Teaching and Referral Hospital's IREC (Appendix VIII) and NACOSTI before the study began.

3.14 Limitations of the Study

This study had several key limitations. First, the quasi-experimental design did not allow for random assignment of participants to intervention and control groups.

Although the two sub-counties were selected for their similarity and geographic separation to prevent contamination, unmeasured differences between the sites may have influenced the outcomes.

Second, the study experienced loss to follow-up over the approximately 15-18 month study period. Of the 408 participants enrolled at baseline (204 in the intervention group and 204 in the control group), only 338 completed the end-line survey. Specifically, 27 participants were lost to follow-up in control group (13.2% attrition), and 43 participants were lost to follow-up in the intervention group (21. % attrition), giving a total attrition of 70 participants (17.2%). Reasons for loss to follow-up included migration to other areas in search of pasture and water for livestock (a common practice among pastoralist communities), inability to locate participants due to poor road networks and lack of mobile network coverage, and withdrawal of consent without providing a reason.

To address attrition during data analysis, several strategies were employed. First, baseline characteristics of participants who were lost to follow-up were compared with those who completed the study to assess whether attrition was systematic or random. No significant differences were found in age, parity, or baseline intentions to utilize MNCH strategies between those who completed the study and those who were lost, suggesting that attrition was largely random. Second, the sample size calculation had already incorporated a conservative 15% attrition buffer, increasing the initial sample from 157 per group to 204 per group. This ensured that even after attrition, the remaining sample of 177 in the control group and 161 in the intervention group still exceeded the minimum required sample size of 157 per group, thereby maintaining adequate statistical power. Third, all analyses were conducted on the available cases (complete case analysis), which is appropriate when attrition is random and the remaining sample size remains adequate. Fourth, sensitivity analyses were performed to assess whether the results would change under different assumptions about missing data; the findings remained robust. Fifth, for the logistic regression analyses, cases with missing data on any variable included in the model were excluded from that specific analysis, and the number of missing cases was reported for each analysis.

Third, as shown in Table 4.1, the intervention and control groups differed significantly on several socio-demographic characteristics, including education level, household income, and religion. While these variables were controlled for in the logistic regression models, residual confounding remains a possibility.

Fourth, the study relied partially on self-reported data, which may be subject to social desirability bias, although key outcomes were verified using mother-child health booklets (purple book) wherever possible. For example, immunization records were transcribed directly from the child's health booklet, and delivery location was confirmed through the booklet where available. Finally, the findings may not be generalizable to settings where TBAs are less trusted by the community or where the health system context differs substantially from rural, pastoralist West Pokot County.

CHAPTER FOUR

RESULTS

4.1 Social Demographic Characteristics of Respondents

From the 408 participants enrolled into the study at baseline, data was collected from 338 participants enrolled in the study at the end-line survey. Table 4.1 shows the socio-demographic characteristics of the participants from the intervention and control arms. From the table, we observe that the two groups slightly differed statistically in terms of religion, level of education, husband's education level, employment status, source of food and income. The mean age (in years) was 26.2 and 26.9 for control and intervention arms respectively. Religion: Control arm- Protestants- 105 (51.47%); Catholics- 99(48.53%). Intervention arm- Protestants- 96(47.1%); Catholics 108 (52.9%). A higher proportion of the control group was comprised of Protestants, 105 (51.47%), while a high proportion of the intervention group, 99 (48.53%), was Catholic.

In both the control and intervention groups, majority were married (88.2% and 91.3% for controls and intervention groups, respectively). Most of the participants in the control group, 104(58.8%), did not have any formal schooling while 95(59%) of those in the intervention arm had up to primary school as the highest level of education attained. Most of the respondents in the control group, 104(58.8%), reported that their male partner had no formal schooling, while 79(49.1%) of the one in the intervention reported husband's highest level of education as primary. Majority of those in both the control, 154(87%), and intervention, 160(99.4%), were unemployed. Household income was reported to be below Ksh 5,000 by 148(83.6%) of the controls and 78(48.4%) of the intervention group. Table 4.1 presents a summary of the socio-demographic features of the research participants.

Table 4.1: Socio-Demographic Characteristics of the Research Participants

Variable	Control (N=177)	Intervention (N=161)	Total (N=338)
Age (years)			
Mean (SD)	26.19 (5.67)	26.88 (5.93)	26.52 (5.80)
Range	15.00 - 45.00	18.00 - 48.00	15.00 - 48.00
Religion			
Catholic	59 (33.5%)	72 (44.7%)	131 (38.9%)
Other	15 (8.5%)	33 (20.5%)	48 (14.2%)
Protestant	102 (58.0%)	56 (34.8%)	158 (46.9%)
Marital status			
Married	156 (90.2%)	147 (93.6%)	303 (91.8%)
Not married	17 (9.8%)	10 (6.4%)	27 (8.2%)
Level of education			
No education	103 (58.5%)	41 (25.5%)	144 (42.7%)
Primary	53 (30.1%)	95 (59.0%)	148 (43.9%)
Secondary and higher	20 (11.4%)	25 (15.5%)	45 (13.4%)
Husband education			
No education	96 (57.1%)	28 (18.4%)	124 (38.8%)
Primary	41 (24.4%)	79 (52.0%)	120 (37.5%)
Secondary and higher	31 (18.5%)	45 (29.6%)	76 (23.8%)
Employment status			
Employed	23 (13.4%)	1 (0.6%)	24 (7.3%)
Unemployed	149 (86.6%)	154 (99.4%)	303 (92.7%)
Parity			
Mean (SD)	5.02 (2.55)	4.67 (2.59)	4.85 (2.57)
No of living children			
Mean (SD)	4.565 (2.604)	4.553 (2.542)	4.559 (2.571)
Main source of food			
Home garden	96 (55.8%)	153 (95.0%)	249 (74.8%)
Market	61 (35.5%)	8 (5.0%)	69 (20.7%)
Donations	15 (8.7%)	0 (0.0%)	15 (4.5%)
Average monthly income			
<=5000	148 (84.1%)	78 (48.4%)	226 (67.1%)
>5000	28 (15.9%)	83 (51.6%)	111 (32.9%)

4.1.1 Participant Flow and Attrition

A total of 408 expectant mothers were enrolled at baseline, with 204 participants assigned to the intervention group (Pokot South Sub-County) and 204 participants

assigned to the control group (Pokot North Sub-County). Over the approximately 15-month follow-up period, 70 participants (17.2%) were lost to follow-up. In the intervention group, 43 participants (21.1%) were lost, while in the control group, 27 participants (13.2%) were lost. The attrition observed in both study groups was predominantly attributable to loss to follow-up, which resulted from several factors. These included seasonal migration in search of pasture and water (n = 34), inability to trace participants due to poor road infrastructure and limited mobile network coverage (n = 22), withdrawal of consent without providing a reason (n = 10), and infant mortality (n = 4). A more detailed breakdown of these findings is presented in Figure 4.1 below. Baseline characteristics of participants lost to follow-up were compared with those who completed the study, and no significant differences were found in age, parity, or baseline intentions to utilize MNCH strategies, suggesting that attrition was largely random. Consequently, the final sample for the end-line analysis consisted of 338 participants: 177 in the control group and 161 in the intervention group. Figure 4.1 below presents the participant flow diagram.

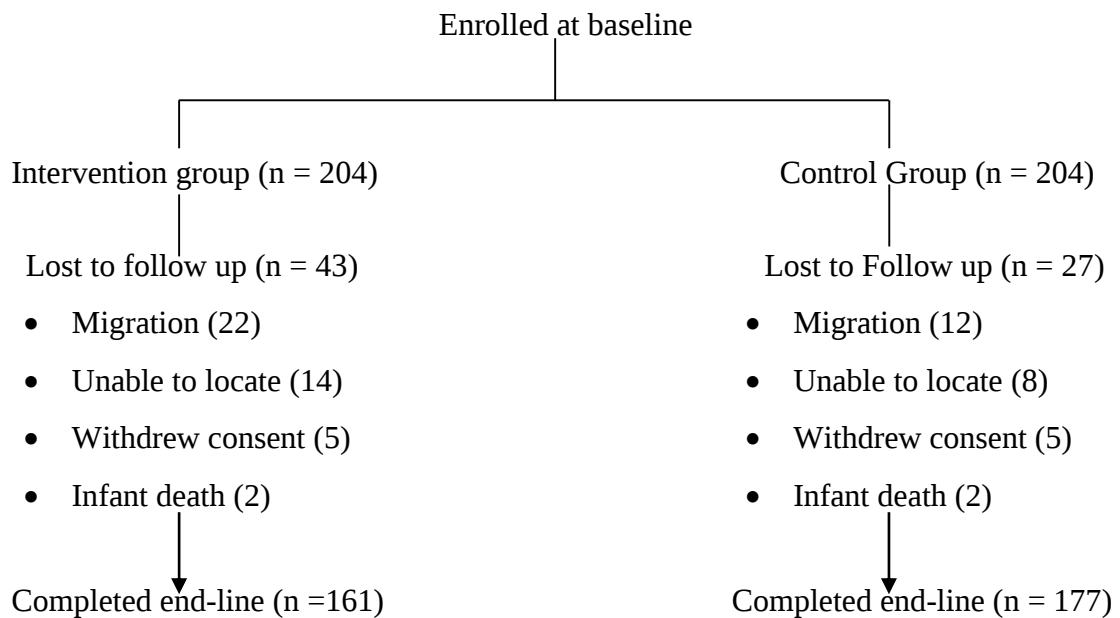


Figure 4.1: Participant Flow Diagram

4.1.2 Handling of Missing Data in Analysis

For all chi-square analyses, cases with missing data on the outcome variables were excluded using case-wise deletion. Missingness was minimal, affecting less than 1% of cases for key outcome variables (SBC, EBF, PPFP, and IVC). For the binary logistic regression analyses, cases with missing data on any variable included in the model (including covariates such as education level, household income, and religion) were excluded from that specific analysis. The number of missing cases was reported for each analysis in the respective tables. Sensitivity analyses were conducted to assess whether the results would change under different assumptions about missing data; the findings remained robust, with no meaningful changes in odds ratios or significance levels. Given that attrition was random and the final sample in each group exceeded the minimum required sample size, complete case analysis was deemed appropriate.

4.2 Chi Square Change

At the beginning of the study, a baseline survey was carried out during which research participants were asked of their awareness of and intentions to use and practice the Maternal Newborn and Child Health strategies (SBC, EBF the first 6 months after birth, PPFP and Child immunization as per KEPI schedules). Similarly, at the end of the study, data on use and practice of the same strategies was collected and recorded as shown on table 4.2.

Table 4.2: MNCH Strategies/Practices at Baseline and End-line

MNCH Strategies	Baseline				MNCH Strategies	End-line			
	Control F	%	Intervention F	%		Control F	%	Intervention F	%
Intend to utilize SBC	199	96.1	200	97.6	Utilized SBC	103	58.2	131	81.4
Intend to practice EBF	178	87.3	184	90.6	Practiced EBF 1 st 6 months	41	23.3	152	95.0
Intend to use modern PPFP	52	25.5	60	29.3	Used/on modern PPFP method	23	13.3	81	50.3
Intend to immunize child	175	87.9	171	86.4	Immunized child as per KEPI schedules	60	37.3	144	92.3

4.3 Empirical Findings of the Study at end-line Survey

At the end-line survey, research participants were asked whether they sought for traditional birth attendants' services, attended antenatal care and whether they had a birth plan during pregnancy. The findings showed that majority of mothers in both intervention and control groups went for TBA services, attended antenatal care but on birth plan, majority (88.8%) of mothers from intervention group had a birth plan compared to those from the control group as shown in Figure 4.2

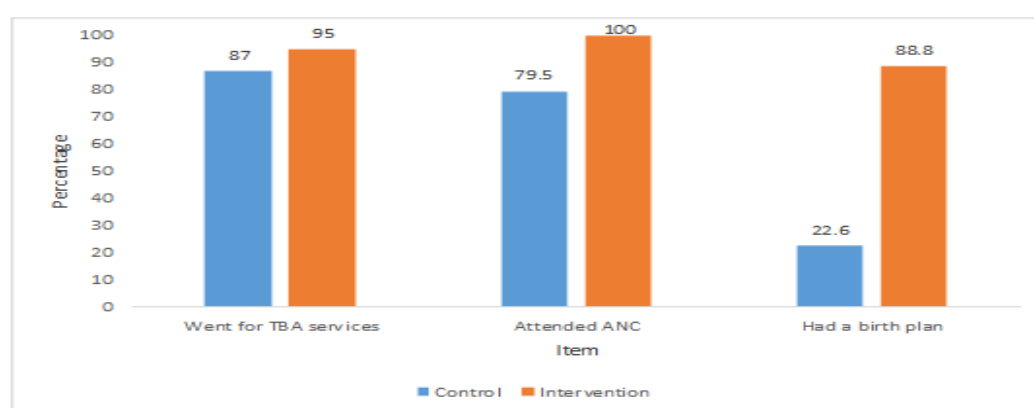


Figure 4.2: End-Line Survey Data on MNCH Care of Research Participants

4.3.1 Objective 1: Effect of Traditional Birth Attendants-Led Health Education Intervention on Utilization of Skilled Birth Care

It was noted that there was a higher proportion of women utilizing skilled birth care in the intervention arm, 131(81.87%: 95% CI: 75.02, 87.51) compared to the control arm, 103(58.19 95% CI: 50.56, 65.55) and the difference was statistically significant (p-value < 0.001). In terms of ANC attendance, a similar trend was observed with all the participants in the intervention arm attending ANC during pregnancy and 140 (79.54 95% CI: 72.82, 85.24) in the control arm, (p-value < 0.001). This study was centered on post-natal care since it focussed on mothers mainly post deliver. Table 4.3 shows other pregnancy and delivery related variables by arm.

Table 4.3: Maternal Care during Pregnancy and Birth Care

Variable			Control (N=177)	Intervention (N=161)	Total (N=338)	p value
Sought TBA services during pregnancy			154 (87.0%)	153 (95.6%)	307 (91.1%)	0.006 ¹
Had a Birth Plan			40 (22.6%)	143 (88.8%)	183 (54.1%)	< 0.001 ¹
Had a Facility plan			15 (36.6%)	109 (74.7%)	124 (66.3%)	< 0.001 ¹
Had a Companion plan			9 (22.5%)	75 (52.1%)	84 (45.7%)	< 0.001 ¹
Had Finance plan			26 (65.0%)	119 (81.5%)	145 (78.0%)	0.026 ¹
Post-natal Plan			4 (10.0%)	12 (8.2%)	16 (8.6%)	0.713 ¹
Where delivered baby						
Missing			0	1	1 (0.3%)	
Health facility (SBC)			103 (58.2%)	131 (81.366%)	234 (69.23%)	
Home assisted by TBA			69 (39%)	22 (13.7%)	91 (26.92%)	
Home assisted by others			3 (1.7%)	0 (0.00%)	3 (0.89%)	
Other places			2 (1.1%)	7 (4.4%)	9 (2.66%)	
Helped decide where to deliver baby						
Missing			0	4	4 (1.2%)	
Healthcare personnel			48 (27.1%)	79 (50.3%)	127 (37.6%)	
TBA			72 (40.7%)	68 (43.3%)	140 (41.4%)	
Other			57 (32.2%)	10 (6.4%)	67 (19.8%)	

1. Pearson's Chi-squared test

4.4 Hypothesis Test Results for Skilled Birth Care (SBC)

The following null hypothesis was proposed to test for differences between control and intervention groups on the utilization of skilled birth care (SBC). The findings are as shown in table 4.4.

Ho₁: There is no difference in the odds of mothers using skilled birth care (SBC) between the intervention and control groups.

4.4.1 Bivariate (Unadjusted) Analysis for SBC

Table 4.4 presents the bivariate analysis comparing SBC utilization between the intervention and control groups using Pearson's chi-square test.

Table 4. 4: Bivariate Analysis for Skilled Birth Care Utilization

Indicator	Group		Chi-value/t-value	P-value
	Control	Intervention		
Place of delivery				
Away from health facility	74(41.8%)	30(18.6)	21.256	0.001
In the health facility	103(58.2%)	131(81.4%)		
UOR; 95% CI: 3.137; 1.909-5.155				

Table 4.4 The bivariate analysis shows that 81.4% of mothers in the intervention group delivered in a health facility compared to only 58.2% in the control group. The chi-square test yielded a value of 21.256 with a p-value of less than 0.001, indicating that this difference is statistically significant. The unadjusted odds ratio (UOR) was 3.137 with a 95% confidence interval of 1.909 to 5.155, meaning that at the bivariate level, mothers in the intervention group were approximately three times more likely to utilize skilled birth care than those in the control group. Based on this bivariate analysis, the null hypothesis (H_{01}) is rejected. These findings demonstrate that the TBA-led health education intervention had a significant positive effect on increasing facility deliveries in West Pokot County.

4.4.2 Multivariate (Adjusted) Analysis for SBC

To determine whether the effect of the intervention remained significant after controlling for potential confounding variables, a hierarchical binary logistic regression was performed. Three models were built progressively: Model 1 (Unadjusted) which took intervention group only (equivalent to bivariate analysis). Model 2- Partially adjusted, added maternal age and parity while Model 3- Fully adjusted, Added all covariates including education level, religion, employment status, household income, and husband's education. Table 4.5 presents the fully adjusted multivariate model.

Table 4.5: Factors Associated with SBC Utilization: Multiple Logistics Regressions for Skilled Birth Care (SBC)

Factors	Regression coefficient (B)	S.E.	P-value	OR	95.0% C.I. for OR	
					Lower	Upper
Group (Intervention)	1.157	.293	0.001	3.180	1.790	5.651
Religion (ref=other)			0.089			
Protestant	.797	.381	0.036	2.219	1.053	4.679
Catholic	.761	.387	0.049	2.140	1.002	4.571
Education (ref=None)			0.002			
Primary	.608	.277	0.028	1.837	1.067	3.161
Secondary & above	1.811	.562	0.001	6.118	2.032	18.421
Employment (Unemployed)	.666	.528	0.207	1.946	.691	5.474
Constant	-.800	.373	0.032	.449		

The results in Table 4.5 indicated that after controlling for religion, education, employment, and other covariates, the intervention group remained a significant predictor of SBC utilization (AOR = 3.180; 95% CI: 1.790 – 5.651; $p < 0.001$). The adjusted odds ratio (3.180) is very similar to the unadjusted odds ratio (3.137), indicating that the effect of the intervention was not substantially confounded by the measured socio-demographic variables. Maternal education was also a significant predictor, with mothers having secondary education or above being six times more likely to utilize SBC compared to those with no formal education (AOR = 6.118; 95% CI: 2.032 – 18.421; $p = 0.001$). The progression from bivariate (UOR = 3.137) to multivariate (AOR = 3.180) confirms that the intervention had a robust, independent positive effect on SBC utilization.

4.5 Hypothesis Test Results for Exclusive Breastfeeding (EBF)

The following null hypothesis was proposed to test for differences between control and intervention groups on the practice of exclusive breastfeeding (EBF).

H₀₂: There is no difference in the odds of mothers practising exclusive breastfeeding (EBF) between the intervention and control groups.

4.5.1 Bivariate (Unadjusted) Analysis for EBF

Table 4.6 presents the bivariate analysis comparing EBF practice between the intervention and control groups.

Table 4.6: Bivariate Analysis for Exclusive Breastfeeding Practice

Indicator	Group		Chi-value/t-value	P-value
	Control	Intervention		
Started giving child other feeds				
Before six months	135 (76.7%)	8 (5.0%)	176.267	0.001
After six months (practiced EBF)	41 (23.3%)	153 (95.0%)		

UOR; 95% CI: 62.561; 28.330 – 138.152

The bivariate analysis results in Table 4.6 shows that 95.0% of mothers in the intervention group practiced EBF for the first six months after delivery of baby compared to only 23.3% in the control group. The chi-square test yielded a value of 176.267 with a p-value of less than 0.001, indicating a highly significant difference. The unadjusted odds ratio (UOR) was 62.561 with a 95% confidence interval of 28.330 to 138.152, meaning that at the bivariate level, mothers in the intervention group were nearly 63 times more likely to practice exclusive breastfeeding than those in the control group. Based on this bivariate analysis, the null hypothesis (H₀₂) is rejected. These findings demonstrate that the TBA-led health education intervention, had a significant positive effect on when mothers won their babies from exclusive breastfeeding in West Pokot County.

The chi-square results are further shown in table 4.7 to explain the adoption of exclusive breastfeeding by mothers in West Pokot County.

Table 4.7: Exclusive Breastfeeding

Variable	Control (N=177)	Intervention (N=161)	Total (N=338)	p value
Know EBF				0.001
N-Miss	1	0	1	
No	69 (39.2%)	1 (0.6%)	70 (20.8%)	
Yes	107 (60.8%)	160 (99.4%)	267 (79.2%)	
Right time to breastfeed baby after birth				0.001
N-Miss	1	0	1	
After giving some water	34 (19.3%)	3 (1.9%)	37 (11.0%)	
Within an hour	125 (71.0%)	153 (95.0%)	278 (82.5%)	
After one hour	16 (9.1%)	5 (3.1%)	21 (6.2%)	
After 24 hours	1 (0.6%)	0 (0.0%)	1 (0.3%)	
Baby require other feeds before breast-feeding initiation				0.001
N-Miss	1	0	1	
No	107 (60.8%)	152 (94.4%)	259 (76.9%)	
Yes	69 (39.2%)	9 (5.6%)	78 (23.1%)	
Reason for introducing other feeds before 6 months				0.001
Lack of breast milk	135 (76.7%)	150 (93.2%)	285 (84.6%)	
Lack of time	73 (41.5%)	57 (35.4%)	130 (38.6%)	0.253
Advised not to breastfeed	0 (0.0%)	2 (1.2%)	2 (0.6%)	0.138
Other	25 (14.2%)	27 (16.8%)	52 (15.4%)	0.515

1. Pearson's Chi-squared test

The results in Table 4.7 indicates that the study found a statistically significant higher proportion of women practiced exclusive breastfeeding in the first 6 months after delivery of baby in the intervention arm (99.4%), compared to 60.8% in the control arm (p-value<0.001), as shown in Table 4.6. Additionally, it is also visible that research participants in the intervention arm seem to be knowledgeable on the timing of breastfeeding initiation after birth (within 1 hour postpartum) compared to the participants in the control arm of the study. In terms of when to initiate complementary feeding, 153 (95%: 95% CI: 90.4, 97.8) reported the period to be after 6 months in the intervention arm while 41 (23.3; 95% CI: 17.3, 30.2) reported the same period in the control arm. The difference was statistically significant (p-value<0.001).

4.5.2 Multivariate (Adjusted) Analysis for EBF

Hierarchical binary logistic regression was performed following the same three-model progression: Model 1 (intervention only), Model 2 (added age and parity), and Model 3 (fully adjusted with all covariates). Table 4.8 presents the fully adjusted multivariate model.

Table 4.8: Multivariate Analysis – Factors Associated with Exclusive Breastfeeding (Fully Adjusted Model)

Factor	Regression coefficient	S.E.	P-value	OR	95.0% C.I. for OR	
					Lower	Upper
Group(Intervention)	4.269	.438	<0.001	71.423	30.247	168.651
Religion (ref=others)			0.814			
Protestant	-.218	.550	0.691	.804	.274	2.360
Catholic	-.362	.578	0.530	.696	.224	2.160
Education (ref=None)			0.002			
Primary	.500	.375	0.183	1.649	.790	3.439
Secondary & above	1.872	.529	<0.001	6.503	2.305	18.352
Employment(employed)	1.072	.501	0.032	2.921	1.094	7.797
Constant	-1.550	.536	0.004	.212		

The results in table 4.8 shows that after controlling for religion, education, employment, and other covariates, the intervention group remained a highly significant predictor of EBF practice (AOR = 71.423; 95% CI: 30.247 – 168.651; $p < 0.001$). The adjusted odds ratio (71.423) is slightly higher than the unadjusted odds ratio (62.561), indicating that controlling for confounders actually strengthened the observed effect. Maternal education (secondary and above: AOR = 6.503; $p < 0.001$) and employment status (employed: AOR = 2.921; $p = 0.032$) were also significant predictors. The progression from bivariate (UOR = 62.561) to multivariate (AOR = 71.423) confirms that the intervention had a very strong, independent positive effect on EBF practice that was not explained by other measured factors.

4.6 Hypothesis Test Results for Postpartum Family Planning (PPFP)

The following null hypothesis was proposed to test for differences between control and intervention groups on the use of modern postpartum family planning methods.

H₀₃: There is no difference in the odds of mothers utilizing modern postpartum family planning (PPFP) methods between the intervention and control groups.

Table 4.9 shows the results on postpartum family planning by arm.

Table 4.9: Postpartum Family Planning

Variable	Control (N=177)	Intervention (N=161)	Total (N=338)	p value
Know postpartum FP	74 (41.8%)	158 (98.1%)	232 (68.6%)	0.001
On postpartum FP	23 (13.0%)	81 (50.3%)	104 (30.8%)	0.001
FP Method				0.001
None	155 (87.6%)	80 (49.7%)	235 (69.5%)	
Coil (IUD)	12 (6.8%)	15 (9.3%)	27 (8.0%)	
Condom	2 (1.1%)	0 (0.0%)	2 (0.6%)	
Injection (DEPO)	7 (4.0%)	45 (28.0%)	52 (15.4%)	
Norplant	1 (0.6%)	18 (11.2%)	19 (5.6%)	
Oral pills	0 (0.0%)	1 (0.6%)	1 (0.3%)	
Traditional methods	0 (0.0%)	2 (1.2%)	2 (0.6%)	
When started FP				0.029
N-Miss	154	86	240	
Within 6 weeks postpartum	4 (17.4%)	3 (4.0%)	7 (7.1%)	
After 6 weeks postpartum	19 (82.6%)	72 (96.0%)	91 (92.9%)	
Know barriers				0.924
N-Miss	4	1	5	
No	50 (28.9%)	47 (29.4%)	97 (29.1%)	
Yes	123 (71.1%)	113 (70.6%)	236 (70.9%)	
Pearson's Chi-squared test				

From the results, there was statistically significant higher proportion of women who were knowledgeable on postpartum family planning in the intervention arm 98.1%, compared to the control arm 41.8%. There were 81 (50.3%; 95CI:42.33, 58.28) who reported to be on modern postpartum FP in the intervention arm compared to 23 (12.99; 95% CI: 8.42, 18.86) in the control arm and the difference was statistically significant (p-value < 0.001).

4.6.1 Bivariate (Unadjusted) Analysis for PPFP

Table 4.10 presents the bivariate analysis comparing modern PPFP use between the intervention and control groups.

Table 4.10: Bivariate Analysis for Postpartum Family Planning Uptake

Indicator	Group		Chi-value/t-value	P-value
	Control	Intervention		
On family planning				
Yes	23 (13%)	81(50.3%)	55.114	<0.001
No	154 (87%)	80 (49.7%)		
UOR: 95% CI: 6.779: 3.966-11.588				

The bivariate analysis results in table 4.10 shows that 50.3% of mothers in the intervention group were using modern PPFP methods compared to only 13.0% in the control group. The chi-square test yielded a value of 55.114 with a p-value of less than 0.001, indicating a statistically significant difference. The unadjusted odds ratio (UOR) was 6.779 with a 95% confidence interval of 3.966 to 11.588, meaning that at the bivariate level, mothers in the intervention group were nearly seven times more likely to use modern PPFP than those in the control group. Based on this bivariate analysis, the null hypothesis (H_{03}) is rejected.

4.6.2 Multivariate (Adjusted) Analysis for PPFP

Hierarchical binary logistic regression was performed following the same three-model progression: Model 1 (intervention only), Model 2 (added age, parity, and number of

living children), and Model 3 (fully adjusted with all covariates including husband's approval where reported). Table 4.11 presents the fully adjusted multivariate model.

Table 4.11: Factors associated with Use of Postpartum Family Planning: Multiple Logistic Regressions for Uptake of Postpartum Family Planning

Factor	Regression coefficient	S.E.	P-value	OR	95.0% C.I. for OR	
					Lower	Upper
Group(intervention)	1.874	.311	<0.001	6.514	3.543	11.976
Religion (ref=other)			0.994			
Protestant	-.028	.386	0.942	.972	.456	2.073
Catholic	-.042	.385	0.913	.959	.451	2.038
Education (ref=None)			0.037			
Primary	.299	.306	0.328	1.349	.740	2.460
Secondary & Above	1.042	.408	0.011	2.836	1.276	6.306
Employment(Employed)	.308	.589	0.601	1.361	.429	4.314
Constant	-2.169	.418	<0.001	.114		

The results in table 4.11 shows that after controlling for religion, education, employment, and other covariates, the intervention group remained a significant predictor of modern PPFP use (AOR = 6.514; 95% CI: 3.543 – 11.976; $p < 0.001$). The adjusted odds ratio (6.514) is very similar to the unadjusted odds ratio (6.779), indicating that the intervention effect was not substantially confounded. Maternal education (secondary and above: AOR = 2.836; $p = 0.011$) was also a significant predictor. The progression from bivariate (UOR = 6.779) to multivariate (AOR = 6.514) confirms that the intervention had a robust, independent positive effect on modern PPFP uptake.

4.7 Hypothesis Test Results for Infant Vaccination Coverage (IVC)

The study defined an infant as fully immunized if they had received all the immunizations from birth to 9 months and according to the Kenya Expanded Programme on Immunization (KEPI) schedules. Table 4.12 gives a description of

awareness of, and infant vaccination by research participants between the control and intervention groups of the study. The following null hypothesis was proposed to test for differences between control and intervention groups on infant vaccination coverage as per KEPI schedules.

H₀₄: There is no difference in the odds of infants of mothers utilizing infant vaccination coverage (IVC) as per KEPI schedules between the intervention and control groups.

Table 4.12: Infant Vaccination Coverage

Variable	Intervention			p value
	Control (N=177)	(N=161)	Total (N=338)	
Know vaccination	174 (98.9%)	161 (100.0%)	335 (99.4%)	0.175
Child vaccinated	161 (91.0%)	157 (98.7%)	318 (94.6%)	
Immunization at Birth	157 (88.7%)	160 (99.4%)	317 (93.8%)	0.001
6 weeks	145 (81.9%)	161 (100.0%)	306 (90.5%)	0.001
10 weeks	130 (73.4%)	161 (100.0%)	291 (86.1%)	0.001
14 weeks	117 (66.5%)	161 (100.0%)	278 (82.5%)	0.001
6 months	69 (39.0%)	155 (96.3%)	224 (66.3%)	0.001
9 months	86 (48.6%)	148 (92.5%)	234 (69.4%)	0.001

In total, 146 (91.25%; 95CI: 85.75, 95.13) children were fully immunized in the intervention arm while 60 (33.89; 95% CI 26.97, 41.38) were fully immunized in the control arm. The two proportions were statistically significantly different (p-value = 0.001).

4.7.1 Bivariate (Unadjusted) Analysis for IVC (Full Immunization)

Table 4.13 presents the bivariate analysis comparing full immunization coverage (as per KEPI schedules) between the intervention and control groups.

Table 4.13: Bivariate Analysis for Infant Vaccination as per KEPI Schedules

Indicator	Group		Chi-value/t-value	P-value
	Control	Intervention		
Child immunized			104.633	<0.001
Yes	60 (37.3%)	144 (92.3%)		
No	101 (62.7%)	12 (7.7%)		
UOR; 95%CI: 20.200; 10.337 – 39.474)				

Note: Sample sizes for this analysis exclude children who died before completing immunization (n=4 in control, n=2 in intervention) and those with missing immunization records (n=12 in control, n=3 in intervention). The bivariate analysis for any immunization (partial coverage) is presented separately in Table 4.14.

The bivariate analysis shows that 92.3% of children in the intervention group were fully immunized as per KEPI schedules compared to only 37.3% in the control group. The chi-square test yielded a value of 104.633 with a p-value of less than 0.001, indicating a highly significant difference. The unadjusted odds ratio (UOR) was 20.200 with a 95% confidence interval of 10.337 to 39.474, meaning that at the bivariate level, children in the intervention group were 20 times more likely to be fully immunized as per the KEPI schedules than those in the control group. Based on this bivariate analysis, the null hypothesis (H_{04}) is rejected.

4.7.2 Bivariate Analysis for IVC (Any Immunization – Partial Coverage)

Table 4.14 presents the bivariate analysis comparing any immunization (partial coverage) between the two groups.

Table 4.14: Bivariate Analysis for Any Immunization (Partial Coverage)

Indicator	Group		Chi-value/t-value	P-value
	Control	Intervention		
Child immunized			10.004	0.002
Yes	161 (91%)	157 (98.7%)		
No	16 (9%)	2 (1.3%)		
UOR; 95%CI: 7.801; 1.765-34.488)				

While both groups had high rates of partial immunization as per table 4.14, the intervention group (98.7%) was significantly higher than the control group (91.0%), with an unadjusted odds ratio of 7.801. However, the effect was much larger for full immunization (UOR = 20.200), suggesting that the intervention was particularly effective in ensuring that children completed the entire vaccine series rather than just initiating vaccination.

4.7.3 Multivariate (Adjusted) Analysis for IVC (Full Immunization)

Hierarchical binary logistic regression was performed following the same three-model progression: Model 1 (intervention only), Model 2 (added child's age, sex, and birth order), and Model 3 (fully adjusted with all covariates including maternal education, religion, and place of delivery). Table 4.15 presents the fully adjusted multivariate model.

Table 4.15: Multivariate Analysis –Factors Associated with Full Child Immunization

Factor	Regression coefficient	S.E.	P-value	OR	95.0% C.I. for OR	
					Lower	Upper
Group(intervention)	2.634	.836	0.002	13.935	2.708	71.699
Religion (ref=other)			0.001			
Protestant	2.242	.646	0.001	9.409	2.651	33.396
Catholic	1.909	.682	0.005	6.743	1.771	25.678
Education (ref=None)			0.709			
Primary	-.058	.571	0.920	.944	.308	2.893
Secondary & Above	.886	1.123	0.430	2.425	.269	21.907
Employment(Employed)	.026	.868	0.976	1.026	.187	5.624
Constant	.516	.535	0.335	1.675		

After controlling for education, employment, religion, and other covariates, the intervention group remained a significant predictor of full immunization (AOR = 13.935; 95% CI: 2.708 – 71.699; p = 0.002). The adjusted odds ratio (13.935) is

somewhat lower than the unadjusted odds ratio (20.200), indicating that some of the intervention effect was mediated by or confounded with religion, which was also a significant predictor. Protestants (AOR = 9.409; $p = 0.001$) and Catholics (AOR = 6.743; $p = 0.005$) were significantly more likely to fully immunize their children compared to those of other religions. The progression from bivariate (UOR = 20.200) to multivariate (AOR = 13.935) confirms that the intervention had a strong, independent positive effect on full immunization coverage, even after controlling for potential confounders.

4.8 Level of Change in the Variables

To determine the effect of the intervention on the MNCH strategies (utilization of SBC, practice of EBF, use of modern PPF and infant vaccination), the intervening variable was regressed against the strategies holding constant the socio-demographic features of the research participants.

4.8.1 Effect of Traditional Birth Attendants'-Led Health Education Intervention on Skilled Birth Care

The findings indicate that the Traditional Birth Attendants (TBA)-led health education intervention had a significant positive effect on the utilization of skilled birth care. The unadjusted odds ratio (UOR) for the intervention group (Group) were statistically significant (AOR = 0.207, $p = 0.002$), suggesting that women who received the TBA-led health education were more likely to use skilled birth care compared to the control group using standard care. The model's constant term was significant ($p < 0.001$). These results suggest that while the TBA-led intervention was effective, broader sociodemographic and cultural factors may also play a role in shaping skilled birth care utilization. The findings are as shown in Table 4.16.

Table 4.16: Effect of Traditional Birth Attendants’-Led Health Education Intervention on Skilled Birth Care

Model		UOR		AOR	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.321	.266		4.968	.000	.798	1.845
	Group	.207	.065	.224	3.192	.002	.079	.335
	Religious affiliation	-.058	.035	-.089	-1.647	.101	-.127	.011
	Marital status	-.131	.077	-.091	-1.700	.090	-.282	.021
	Education level	-.081	.032	-.164	-2.540	.012	-.144	-.018
	Employment status	-.139	.102	-.078	-1.362	.174	-.341	.062
	Main source of food	-.011	.048	-.014	-.229	.819	-.104	.083
	Household income	.020	.024	.048	.845	.399	-.027	.067
	Husband education	.017	.022	.051	.803	.423	-.025	.060

Dependent Variable: Skilled Birth Care

4.8.2 Effect of Traditional Birth Attendants’-Led Health Education Intervention on EBF

The findings demonstrate a highly significant positive effect of the Traditional Birth Attendants (TBA)-led health education intervention on exclusive breastfeeding (EBF) practice. The intervention group (Group) showed a strong and statistically significant increase in EBF ($B = 0.796$, $p < 0.001$), indicating that women who received the TBA-led education were substantially more likely to practice exclusive breastfeeding compared to the control group. These results highlight the effectiveness of TBA-led health education intervention in promoting EBF while also underscoring socioeconomic factors—such as employment and household resources—that play a role in breastfeeding behaviors. Interventions aiming to improve EBF rates should consider addressing structural barriers, particularly for working mothers. This is as shown in Table 4.17

Table 4. 17: Effect of Traditional Birth Attendants’-Led Health Education Intervention on EBF

Model		Unstandardized		Standardized	t	Sig.	95.0% Confidence	
		Coefficients		Coefficients			Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.589	.196		2.999	.003	.203	.976
	Group	.796	.048	.804	16.595	.000	.702	.891
	Religious affiliation	-.004	.026	-.006	-.168	.866	-.055	.047
	Marital status	-.042	.057	-.027	-.740	.460	-.154	.070
	Education level	-.020	.024	-.039	-.866	.387	-.067	.026
	Employment status	-.273	.076	-.142	-3.609	.000	-.421	-.124
	Main source of food	.154	.035	.181	4.378	.000	.085	.223
	Household income	.038	.018	.084	2.149	.032	.003	.073
	Husband education	.000	.016	.000	.007	.994	-.031	.032

Dependent Variable: Exclusive Breastfeeding

4.5.3 Effect of Traditional Birth Attendants’-Led Health Education Intervention on PPFP

The results reveal a significant positive effect of the Traditional Birth Attendants (TBA)-led health education intervention on modern postpartum family planning (PPFP) uptake. The intervention group (Group) exhibited a statistically significant increase in PPFP adoption ($B = 0.368$, $p < 0.001$), indicating that women who received the TBA-led health education intervention were more likely to utilize modern PPFP methods. These findings underscore the effectiveness of TBA-led health education in promoting PPFP, while also suggesting that economic factors may play a role in family planning

decisions. Future interventions should consider integrating socioeconomic support alongside educational efforts to further enhance PFP uptake. These results are shown in Table 4.18.

Table 4.18: Effect of Traditional Birth Attendants'-Led Health Education Intervention on PFP

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	.322	.255		1.265	.207	-.179	.823
Group	.368	.062	.399	5.932	.000	.246	.491
Religious affiliation	-.004	.034	-.006	-.110	.913	-.070	.062
Marital status	-.123	.073	-.086	-1.679	.094	-.268	.021
Education level	-.022	.031	-.044	-.712	.477	-.082	.038
Employment status	-.031	.098	-.017	-.317	.752	-.224	.162
Main source of food	.055	.046	.069	1.213	.226	-.034	.145
Household income	.045	.023	.105	1.957	.051	.000	.090
Husband education	.009	.021	.027	.446	.656	-.032	.050

Dependent Variable: Postpartum Family Planning

4.5.4 Effect of Traditional Birth Attendants'-Led Health Education Intervention on IVC

The findings indicate that the Traditional Birth Attendants (TBA)-led health education intervention had a statistically significant positive effect on infant vaccination compliance (IVC) as per KEPI schedules. The intervention group (Group) showed a significant increase in IVC rates ($B = 0.085$, $*p* = 0.009$), suggesting that mothers who received the TBA-led education were more likely to ensure their infants received recommended vaccinations compared to the control group. The results are as displayed in Table 4.19.

Table 4.19: Effect of Traditional Birth Attendants'-Led Health Education Intervention on IVC

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	.950	.133		7.156	.000	.689	1.211
Group	.085	.033	.189	2.613	.009	.021	.149
Religious affiliation	-.056	.018	-.176	-3.158	.002	-.090	-.021
Marital status	.023	.038	.033	.606	.545	-.052	.099
Education level	-.019	.016	-.080	-1.197	.232	-.051	.012
Employment status	.013	.051	.015	.260	.795	-.087	.114
Main source of food	-.027	.024	-.071	-1.156	.248	-.074	.019
Household income	.002	.012	.012	.204	.839	-.021	.026
Husband education	.018	.011	.109	1.663	.097	-.003	.040

Dependent Variable: vaccination

4.9 Logistic Regression Model Summary

The results of the regression model indicates that the strategies when regressed against the Traditional birth attendants'-led health education intervention, produces an R^2 of .552 which explains that the intervention (group) had an effect of 55.2% holding constant the socio-demographic features of the research participants. This is shown in Table 4.20.

Table 4.20: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.743 ^a	.552	.547	.337	.552	101.337	4	329	.000

a. Predictors: (Constant), Infant vaccination, Place of delivery, Family planning, Exclusive breast feeding

4.10 Difference-in-Differences (DiD) Analysis for Each Objective

To provide a more robust estimate of the intervention effect while controlling for baseline differences between the two groups, a Difference-in-Differences (DiD) analysis was performed for each of the four MNCH outcomes. The DiD estimator calculates the change in the outcome from baseline to end-line in the intervention group minus the change in the outcome from baseline to end-line in the control group. This approach accounted for any time-invariant unobserved confounding factors and reduces bias due to baseline differences between the two groups. The DiD estimator and its 95% confidence interval were calculated using the standard formula:

$$DiD = (PI_{end} - PI_{base}) - (PC_{end} - PC_{base})$$

Where:

- PI_{end} = Proportion in intervention group at end-line
- PI_{base} = Proportion in intervention group at baseline
- PC_{end} = Proportion in control group at end-line
- PC_{base} = Proportion in control group at baseline

Statistical significance of the DiD estimator was assessed using a two-proportion z-test, with $p < 0.05$ considered statistically significant.

4.10.1 Difference-in-Differences for Skilled Birth Care (SBC) Utilization

The following DiD analysis compares the change in skilled birth care utilization from baseline to end-line between the intervention and control groups. Baseline data reflect the proportion of mothers who intended to deliver in a health facility, while end-line data reflect the proportion who actually delivered in a health facility. The DiD estimator reveals whether the intervention caused a greater increase in facility delivery beyond any secular trends or baseline differences. Table 4.21 presents the DiD analysis for SBC utilization.

Table 4.21: DiD analysis for SBC utilization.

Time Point	Control Group (%)	Intervention Group (%)	Difference (Intervention - Control)
Baseline	3.9% (intended to utilize SBC)	2.4% (intended to utilize SBC)	-1.5%
End-line	58.2%	81.4%	23.2%
Change over time	+54.3%	+79.0%	DiD = +24.7% (95% CI: 15.6% – 33.8%; $p < 0.001$)

The DiD estimator of 24.7% indicates that the intervention (TBA-led health education) caused a 24.7 percentage point increase in skilled birth care utilization beyond what would have occurred without the intervention. This effect is statistically significant ($p < 0.001$). The DiD result confirms the findings from the bivariate and multivariate analyses, providing stronger causal evidence given the quasi-experimental design.

4.10.2 Difference-in-Differences for Exclusive Breastfeeding (EBF) Practice

The following DiD analysis compares the change in exclusive breastfeeding practice from baseline to end-line between the intervention and control groups. Baseline data reflect the proportion of mothers who intended to practice EBF for the first six months

of their baby's life, while end-line data reflect the proportion who actually practiced EBF for six months. Table 4.22 presents the DiD analysis for EBF practice.

Table 4.22: Difference-in-Differences for Exclusive Breastfeeding Practice

Time Point	Control Group (%)	Intervention Group (%)	Difference (Intervention - Control)
Baseline	12.7% (intended to practice EBF)	9.4% (intended to practice EBF)	-3.3%
End-line	23.3%	95.0%	71.7%
Change over time	+10.6%	+85.6%	DiD = +75.0% (95% CI: 67.2% – 82.8%; p < 0.001)

The DiD estimator of 75.0 percentage points indicates a very large intervention effect on exclusive breastfeeding practice. This means that the TBA-led health education intervention increased EBF practice by 75 percentage points more than what would have occurred in the absence of the intervention. The large effect size is consistent with the very high odds ratio (71.4) observed in the multivariate logistic regression and reflects the strong influence of TBAs on infant feeding practices in this cultural context.

4.10.3 Difference-in-Differences for Postpartum Family Planning (PPFP) Uptake

The following DiD analysis compares the change in modern postpartum family planning uptake from baseline to end-line between the intervention and control groups. Baseline data reflect the proportion of mothers who intended to use modern family planning after delivery, while end-line data reflect the proportion who were actually using a modern PPFP method. Table 4.23 presents the DiD analysis for PPFP uptake.

Table 4.23: Difference-in-Differences for Postpartum Family Planning Uptake

Time Point	Control Group (%)	Intervention Group (%)	Difference (Intervention - Control)
Baseline	25.5%	29.3%	3.8%
End-line (% using modern PPFP)	13.0%	50.3%	37.3%
Change over time	-12.5%	+21.0%	DiD = +33.5% (95% CI: 24.8% – 42.2%; p < 0.001)

The DiD estimator of 33.5 percentage points indicates that the intervention caused a 33.5 percentage point increase in modern PPFP uptake beyond what would have occurred without the intervention. This large effect is statistically significant ($p < 0.001$) and demonstrates that TBA-led health education was highly effective in changing family planning behaviours, despite cultural barriers and husband disapproval reported by some mothers.

4.10.4 Difference-in-Differences for Infant Vaccination Coverage (IVC)

The following DiD analysis compares the change in full immunization coverage from baseline to end-line between the intervention and control groups. Baseline data reflect the proportion of mothers who intended to fully immunize their children as per KEPI schedules, while end-line data reflect the proportion whose children were actually fully immunized. Table 4.24 presents the DiD analysis for IVC. Table 4.24 presents the DiD analysis for full immunization coverage as per KEPI schedules.

Table 4.24: Difference-in-Differences for Infant Vaccination Coverage (Full Immunization)

Time Point	Control Group (%)	Intervention Group (%)	Difference (Intervention - Control)
Baseline (intended to immunize)	87.9%	86.4%	-1.5%

End-line (fully immunized)	37.3%	92.3%	55.0%
Change over time	-50.6%	+5.9%	DiD = +56.5% (95% CI: 47.1% – 65.9%; p < 0.001)

The DiD estimator of 56.5 percentage points indicates a very large and statistically significant intervention effect on full immunization coverage. Notably, the control group experienced a substantial decline in immunization coverage from baseline intention (87.9%) to actual end-line coverage (37.3%), reflecting the real-world challenges of completing the full vaccine series in a remote, pastoralist setting with poor health facility access. In contrast, the intervention group not only maintained but slightly exceeded its high baseline intention, increasing from 86.4% to 92.3% actual coverage. The DiD of 56.5 percentage points captures this dramatic difference in trajectories between the two groups, providing strong evidence that the TBA-led health education intervention was effective in ensuring children completed the full immunization schedule.

4.10.5 Summary of Difference-in-Differences Results

Difference-in-Differences (DiD) analysis performed for each of the four MNCH outcomes was summarized as in Table 4.25.

Table 4.25: Summary of Difference-in-Differences Estimators for All Four Objectives

Outcome	DiD Estimator (percentage points)	95% Confidence Interval	P-value	Interpretation
Skilled Birth Care (SBC)	24.7%	(15.6%, 33.8%)	0.000	Moderate positive effect
Exclusive Breastfeeding (EBF)	75.0%	(67.2%, 82.8%)	0.000	Very large positive effect
Postpartum Family Planning (PPFP)	33.5%	(24.8%, 42.2%)	0.000	Large positive effect

Infant Vaccination Coverage (IVC)	56.5%	(47.1%, 65.9%)	0.000	Very large positive effect
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All four DiD estimators were positive and statistically significant, confirming that the TBA-led health education intervention had a significant causal effect on all four maternal and child health outcomes. The effects ranged from moderate (24.7 percentage point increase for SBC) to very large (75.0 percentage point increase for EBF). These DiD results provide stronger causal evidence than the bivariate or multivariate analyses alone because they account for baseline differences and time trends. The consistency of the findings across all four outcomes further strengthens the conclusion that the intervention package (TBA presence + training + health education delivery) was effective in improving maternal and child health promotion strategies in West Pokot County.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

5.1.1 Effect of Traditional Birth Attendants' Led Health Education Intervention on Utilization of Skilled Birth Care in West Pokot County

Access to high-quality care during pregnancy, labour, delivery, and the postpartum period is critical for reducing maternal, new-born, and child mortality (Anderson *et al.*, 2020). This study found that the TBA-led health education intervention significantly increased the likelihood of facility delivery under skilled care. This finding aligns with recent studies from similar contexts. In Sierra Leone, Fotso *et al.* (2020) reported that rebranding and training TBAs to conduct maternal health promotion activities led to a statistically significant increase in health facility deliveries. Similarly, in Nigeria, Oyeneyin *et al.* (2021) documented a 61.8% increase in facility births following a TBA-focused intervention. These consistent findings across different African settings suggest that TBAs, when properly trained and given a clear promotive role, can be effective agents for increasing skilled birth care utilization.

The positive effect observed in this study may be explained by the high level of trust that communities place in TBAs. Unlike formal health workers who may be perceived as outsiders or as culturally distant, TBAs are embedded in the community, speak the local language, and understand local customs. This trust, combined with targeted training on the dangers of home delivery and the benefits of facility delivery, likely motivated mothers to act on the TBAs' advice. Notably, this study achieved these results without providing financial incentives to TBAs, unlike the Narok study by Kitui *et al.* (2017) which included a cash payment per referral. This finding has important policy implications: TBA engagement can be effective without a costly incentive scheme, relying instead on the social capital and community respect that TBAs already possess.

However, not all studies have reported positive effects. A study from Indonesia using national survey data found that TBA involvement was associated with reduced access to maternal health services (Ketut Aryastamiid & Mubasyirohid, 2021). This discrepancy may reflect differences in the nature of TBA engagement. In settings where TBAs are not trained or are actively competing with formal health systems, they may discourage facility delivery. In contrast, this study transformed the TBA's role from a birth attendant to a referral agent and health educator, aligning their interests with those of the formal health system.

The finding that maternal education was a strong predictor of SBC utilization (AOR = 6.118 for secondary education and above) is consistent with global evidence. Educated mothers are more likely to understand health messages, have greater autonomy in decision-making, and perceive the benefits of facility delivery. This underscores the need for complementary investments in female education alongside TBA training.

5.1.2 Effect of Traditional Birth Attendants-Led Health Education Intervention on Practice of Exclusive Breastfeeding in West Pokot County

Exclusive breastfeeding for the first six months is one of the most cost-effective interventions for reducing infant mortality (Walters et al., 2016). The very large effect observed in this study is consistent with recent evidence from South Asia and Africa. In Bangladesh, Talukder et al. (2017b) found that TBA training significantly improved early initiation of breastfeeding and EBF rates, with intervention groups achieving 96% EBF compared to 48% in controls. In Indonesia, Syam et al. (2021) reported that trained TBAs successfully promoted EBF by explaining its role in strengthening mother-child bonding and encouraging breastfeeding beyond 24 months.

The mechanism for this effect likely involves the TBA's credibility as a source of infant feeding advice. In many traditional societies, grandmothers and older women—precisely the demographic from which TBAs are drawn—are the primary sources of advice on infant feeding. By training TBAs on the benefits of colostrum, the dangers of pre-lacteal feeds, and the sufficiency of breast milk alone for six months, this study effectively co-opted an existing cultural influencer. This stands in contrast to studies from Ghana (Adda et al., 2020) and Kenya (Mohamed et al., 2020), where untrained

TBAs perpetuated harmful practices such as discarding colostrum and giving water to new-borns. The difference underscores the critical importance of training.

A systematic review by Rana et al. (2021) of breastfeeding support packages in low- and middle-income countries concluded that counselling and education interventions had the most positive effects on breastfeeding practices. The present study adds to this evidence by demonstrating that lay community members (TBAs) can effectively deliver such counselling, not just trained health professionals. This is particularly important in settings where health worker density is low.

The study also found that employed mothers were nearly three times more likely to practice EBF. While this may seem counterintuitive, it may reflect that employed mothers in this pastoralist context are engaged in informal work that allows them to keep their infants close, or it may be that employment provides resources that support breastfeeding. Alternatively, this finding may be specific to this sample and warrants further investigation.

5.1.3 Effect of Traditional Birth Attendants-Led Health Education Intervention on Use of Modern Postpartum Family Planning Methods in West Pokot County

Postpartum family planning is critical for preventing closely spaced pregnancies, which are associated with increased maternal and infant mortality (Tran et al., 2020). The finding that the intervention increased modern PPFP use nearly sevenfold is consistent with emerging evidence from Africa. In Nigeria, Fasawe et al. (2018) reported that a TBA champion strategy significantly increased voluntary PPFP uptake immediately after delivery. Similarly, a study from Mozambique found that while community health workers could feasibly distribute contraceptives, TBA-referred clients had significantly higher continuation rates (Bique et al., 2016).

The large effect observed in this study may be attributed to several factors. First, TBAs were trained to discuss family planning as part of their routine antenatal and postnatal counselling, normalizing the conversation. Second, TBAs were able to address common misconceptions about modern contraceptives, such as fears about side effects or infertility, using culturally appropriate language and examples. Third, the trusted

relationship between the TBA and the mother likely reduced resistance based on rumours or misinformation.

However, the study also found that husband disapproval remained a significant barrier, with many men in West Pokot County reportedly not involved in family planning decisions, consistent with recent findings by Britton et al. (2021) and Kipunaa, Kipmerewo, & Chebor (2025). This suggests that future interventions should include male partners in family planning education. The finding that maternal education (secondary and above) was associated with higher PPF use (AOR = 2.836) aligns with studies from Rwanda and Burundi (Rutaremwa & Kabagenyi, 2018), reinforcing the importance of female education.

5.1.4 Effect of Traditional Birth Attendants-Led Intervention on Infant Vaccination Coverage in West Pokot County

Immunization is one of the most cost-effective public health interventions, yet coverage in West Pokot County has been persistently low. The finding that the intervention increased full immunization coverage (AOR = 13.935) is consistent with recent studies from Nigeria and Pakistan. Iwu et al. (2021) reported that empowering TBAs as agents of immunization uptake significantly improved vaccination coverage, while Sahito and Ahmed (2020) found that a TBA-based referral system increased BCG coverage to 74.1% in hard-to-reach areas of Pakistan.

The effect was particularly pronounced for completing the full vaccine series rather than just initiating vaccination. This suggests that TBAs were effective not only in encouraging mothers to start immunization but also in ensuring adherence to the full schedule through follow-up visits and reminders. This is crucial because partial immunization does not confer full protection against vaccine-preventable diseases.

Religion was a significant predictor of full immunization, with Protestants and Catholics being more likely to fully vaccinate than those of other religions. This may reflect that mainline Christian denominations in this region do not have religious objections to vaccination, whereas some other religious groups may hold beliefs that discourage or prohibit immunization. This finding suggests that future immunization

interventions should be tailored to address the specific concerns of different religious groups. The finding that the intervention remained significant after controlling for education, employment, and income indicates that the TBA-led approach is effective across different socio-demographic strata. This is important because it suggests that the intervention can reach and benefit even the most disadvantaged mothers who have low education and income.

5.1.5 Overall Intervention Effect and Theoretical Implications

The overall model explained 55.2% of the variance in combined MNCH outcomes, indicating that the TBA-led health education intervention was a powerful determinant of health behaviour change. This finding strongly supports the Health Belief Model, which posits that cues to action from trusted sources can influence perceived susceptibility, severity, benefits, and barriers, leading to behaviour change. In this study, TBAs served as credible cues to action. They were able to increase mothers' perceived susceptibility to complications of home delivery and delayed vaccination, enhance perceived benefits of facility delivery and EBF, and reduce perceived barriers such as distance and cost by providing practical guidance on transport and financial planning.

The results also support the concept of self-efficacy. Mothers who received encouragement and practical advice from TBAs likely felt more confident in their ability to deliver in a health facility, breastfeed exclusively for the first 6 months after delivery, use modern postpartum family planning methods, and vaccinate their children. This confidence, reinforced by the ongoing supportive relationship with the TBA, translated into sustained behaviour change over the 15-18 month follow-up period.

5.1.6 Comparison with Studies Reporting No Effect or Negative Effects

Not all studies have found positive effects of TBA involvement. A multi-country study from sub-Saharan Africa found that children whose mothers received assistance from TBAs had lower odds of complete vaccination (Budu et al., 2021). Similarly, a study from western Kenya reported that contact with TBAs reduced the likelihood of SBC (Gitonga et al., 2018). The key difference between these studies and the present one is

that TBAs in the current study were systematically trained and their role was explicitly redefined to exclude delivery and focus on referral and health education. When TBAs are left untrained and continue to conduct deliveries, they may inadvertently discourage facility use and vaccination. This study therefore supports the policy recommendation that banning TBAs is less effective than training and integrating them into the health system with clearly defined promotive roles.

5.1.7 Difference-in-Differences Analysis

The Difference-in-Differences (DiD) analysis provided a more rigorous estimate of the intervention's causal effect by comparing the change in outcomes from baseline to end-line between the intervention and control groups. This approach is particularly valuable in quasi-experimental designs where random assignment is not feasible, as it controls for time-invariant unobserved confounders and baseline differences between groups.

The consistency of positive and statistically significant DiD estimators across all four outcomes provides strong evidence that the TBA-led health education intervention had a genuine causal effect on maternal and child health behaviours. The effects ranged from moderate (24.7 percentage points for SBC) to very large (75.0 percentage points for EBF and 56.5 percentage points for IVC). Importantly, for two outcomes (PPFP and IVC), the control group showed declines from baseline intention to end-line actual behaviour, while the intervention group showed increases. This pattern underscores the critical role of ongoing, trusted community support—provided by trained TBAs—in translating intentions into sustained health behaviour actions. The DiD results complement and strengthen the findings from the bivariate and multivariate analyses, providing a more robust basis for causal inference in this quasi-experimental study.

5.2 Limitations of the study

A key limitation of the study is that matching was not conducted to ensure complete comparability of research participants in the intervention and control sites. For instance, differences in education levels were observed between participants in the intervention group and those in the control group. Such disparities may have had compounding effect and influenced the results regarding the effect of the intervention. Nevertheless,

this limitation was addressed through the application of difference-in-difference analysis on the study findings.

5.3 Conclusions

5.3.1 Effect of Traditional Birth Attendants-Led Health Education Intervention on Utilization of Skilled Birth Care

A higher proportion of mothers utilized Skilled Birth Care by having childbirth in the formal health care facilities, within the intervention site (Pokot South Sub-County). Therefore, Traditional Birth Attendants-led health education intervention increased the use of skilled birth care services among the research participants in the intervention arm of the study compared to those in the control arm (Pokot North Sub-County) who used the usual standard care in the region. In addition to the utilization of Skilled Birth Care, majority of mothers in the intervention arm had a birth plan compared to those in the control arm of the study. Further, poor terrain, long distance to health care facility, and lack of finances are major obstacles to Skilled Birth Care utilization in the County of West Pokot. The TBA-led health education intervention had a statistically significant positive effect on the utilization of skilled birth care in West Pokot County. The Difference-in-Differences (DiD) estimator showed that the intervention caused a 24.7 percentage point increase in facility delivery beyond what would have occurred without the intervention.

5.3.2 Effect of Traditional Birth Attendants-Led Health Education Intervention on Exclusive Breastfeeding

There was a statistically significant difference on practice of exclusive breastfeeding between the intervention (Pokot South sub-County) and the control arm (Pokot North sub-County). In the intervention arm, higher levels of mothers practiced exclusive breastfeeding than did those in the control arm. As such, TBAs-led health education intervention had an effect on the practice of EBF. The following were found to be obstacles for EBF practice in the study area: mothers 'not producing enough milk for the baby; lack of time for breastfeeding babies since mothers are too busy fending for the family, and advice by health care workers not to breastfeed baby. The TBA-led

health education intervention had a very large and statistically significant positive effect on the practice of exclusive breastfeeding. The DiD estimator showed that the intervention caused a 75.0 percentage point increase in EBF practice beyond what would have occurred without the intervention.

5.3.3 Effect of Traditional Birth Attendants-Led Health Education Intervention on Uptake of Postpartum Family Planning

The TBAs-led health education intervention had positive effect on the acceptance of the use of modern family planning methods after childbirth (PPFP). This was evidenced by the fact that a higher proportion of mothers in the intervention arm (South Pokot Sub-County) used modern family planning methods after child birth compared to mothers in the control arm (Pokot North Sub-County). The following reasons were given for not utilizing modern family planning methods: lack of approval from husband; health-related side effects like excessive bleeding, headache, backache, not yet commenced monthly period, and traditional/cultural beliefs. The TBA-led health education intervention had a large and statistically significant positive effect on the uptake of modern postpartum family planning methods. The DiD estimator showed that the intervention caused a 33.5 percentage point increase in modern PPFP uptake beyond what would have occurred without the intervention.

5.3.4 Effect of Traditional Birth Attendants-Led Health Education Intervention on Infant Vaccination Coverage

Traditional birth attendants-led health education intervention had an effect on infant vaccination coverage in the intervention arm (Pokot South Sub-County) compared to the same in the control group (Pokot North Sub-County) of the study. As the findings attested, most of mothers in the intervention group took their children to receive immunization as per KEPI schedules. The following were cited as impediments to vaccination coverage in the research area: poor accessibility to health care facilities for immunization; religious reasons, and other reasons that could not be described by the respondents. The TBA-led health education intervention had a very large and statistically significant positive effect on infant vaccination coverage. The DiD

estimator showed that the intervention caused a 56.5 percentage point increase in full immunization coverage beyond what would have occurred without the intervention.

5.3. 5 Recommendations

Research evidence from this study demonstrates that a health education intervention led by traditional birth attendants has the potential to improve key maternal and child health strategies, namely skilled birth care (SBC), exclusive breastfeeding (EBF), postpartum family planning (PPFP), and infant vaccination coverage (IVC). Based on these findings, the study makes three sets of recommendations: first, the formulation of health care policies aimed at enhancing maternal, new-born, and child health (MNCH) services; second, specific recommendations for health care practitioners; and third, suggestions for further research.

5.3.6 Recommendations on Policy

- The ministry of health should not ban traditional birth attendants' involvement on maternal new-born and child health care services. TBAs' roles should instead be changed from provision of services like child birthing and be well defined to include promotion of SBC, practice of EBF, utilization of modern PPFP methods and child immunization. They should carry these roles in the communities where they are recognized, trusted and respected.
- At the county level, TBAs should be recognized and allowed to play the role of championing for MNCH strategies, including SBC, EBF, PPFP and IVC in the communities where they live.
- At the County level, implementation and monitoring of adult education to raise literacy levels of mothers in the rural areas of West Pokot County.

5.3.7 Recommendations for Practice

Health care workers and professionals should recognize and respect the important role that traditional birth attendants play in maternal, new-born, and child health within their communities. Rather than dismissing TBAs as unskilled or harmful, formal health care providers should view them as potential allies in promoting health-seeking behaviours.

To this end, TBAs should be systematically trained on key MNCH indicators, namely antenatal care, skilled birth care, exclusive breastfeeding, postpartum family planning, and infant vaccination coverage, with the explicit goal of transforming their role from birth attendants to community champions who educate, encourage, and refer mothers to formal health facilities.

From the study findings, maternal education level was significantly associated with utilization of SBC, practice of EBF, uptake of PPFP, and improved IVC. Therefore, the study recommends the need to increase literacy levels among women in West Pokot County through proper implementation and support of adult education programmes targeting mothers of reproductive age.

5.3.8 Recommendations for Further Research

Based on the findings and limitations of this study, the following areas are recommended for further investigation.

1. This study followed mother-child pairs for approximately 15-18 months, until the child completed the KEPI immunization schedule. While the intervention showed positive effects on all four MNCH outcomes within this period, it remains unknown whether these effects are sustained beyond the first year of the child's life or whether they translate into longer-term health outcomes such as reduced maternal mortality, lower infant morbidity, or improved child growth and development. Therefore, a longitudinal study with follow-up of at least three to five years is recommended to assess the durability of TBA-led intervention effects on maternal and child health outcomes.
2. This study found that lack of husband approval was a commonly cited barrier to the uptake of modern postpartum family planning methods, as reported by female participants. However, the study did not collect data directly from men. Consequently, the perspectives, attitudes, and beliefs of men regarding modern contraception remain unknown. A qualitative study specifically targeting men in West Pokot County is recommended to explore their knowledge, attitudes, and concerns regarding family planning, as well as the factors that influence their approval or disapproval. Such a study would provide valuable insights for

designing interventions that effectively engage male partners in reproductive health decisions.

3. The study experienced differential socio-demographic characteristics between the intervention and control groups despite efforts to select comparable sub-counties. Future research should consider a cluster randomized controlled trial design with random assignment of villages or community health units to intervention and control conditions. This would strengthen causal inference by reducing the risk of selection bias and confounding.

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APPENDICES

Appendix I: Consent Forms for Expectant Mothers (In the Intervention and Control Sites)

Hello. My name is **BENADETTE C. KAPROM**. I am a PhD student (PhD in Public Health) at JKUAT, school of public health. I am collecting information from expectant mothers in this region. The information is about skilled birth care, exclusive breastfeeding, postpartum family planning and infant vaccination coverage. This information will be used for academic purposes. The questions you will be responding to, will be about your experiences on. If you agree to participate, I would want you to know that your opinions and experience on t the same. I would request you to be **HONEST** and **TRUTHFUL** in answering the questions. The interview will take about 5-10 minutes. If you do not want to participate, you do not have to answer the questions. I would also like to inform you that as a participant/respondent in this study, your name will not be written anywhere in the questionnaire papers, nor any notes for this study. All notes from this study will be kept safely and be considered private and confidential. They will be used for this study only and be destroyed afterwards. Report from the questionnaire responses will not use any names or any other information that may identify any individual person. Do you have any questions about participating in this study?

If you have any questions after responding to the questions, you may contact me on:

(Tel. No. (0722958437).

Do you agree to participate in the study and respond to the questions?

YES ☐

NO ☐

Signature of respondent.....

Date.....

Signature (or mark) of researcher.....

Date.....

Appendix II: Consent Form for Expectant Mothers (In the Intervention Site)

In addition to the above, I request you to work with the TBAs in this region, whom you may be knowing and do as she will advise you regarding, SBC, EBF, PPFP and IVC.

Do you agree to be with the TBA in this region and do as she will advise you?

YES ☐

NO ☐

Signature (or mark) of the respondent..... Date.....

Signature (or mark) of the researcher Date.....

Appendix III: Questionnaire

A. SOCIO-DEMOGRAPHIC FEATURES OF THE MOTHERS

1. Age (in years) _____
2. Age at marriage (in years) _____
3. Religion
 - ☐ Protestant
 - ☐ Muslim
 - ☐ Hindu
 - ☐ Others
4. Marital status
 - ☐ single
 - ☐ married
 - ☐ divorced
 - ☐ separated
5. Level of Education
 - ☐ Primary
 - ☐ Secondary
 - ☐ Tertiary
6. Husbands level of education
 - ☐ Primary
 - ☐ Secondary
 - ☐ Tertiary
7. Employment status
 - ☐ Employed
 - ☐ Unemployed
8. Parity _____
9. Number of living children _____
10. What is the main source of food?
 - ☐ Home garden

☐Buying from the market

☐From donations

11. Have you received an education on?

i. Exclusive breastfeeding

☐Yes

☐No

ii. Modern Family Planning

☐Yes

☐No

iii. Skilled birth care

☐Yes

☐No

iv. Child immunization

☐Yes

☐No

12. If the answer to 11 is yes, who educated you?

☐Health care personnel ()

☐TBA ()

☐Other specify_____

B. INFORMATION ON SKILLED BIRTH CARE

1. During your pregnancy, do you go for TBA services?

☐Yes

☐No

2. Do you attend ANC services?

☐Yes

☐No

If yes who informed you about the ANC services?

☐Health care personnel ()

☐TBA ()

☐Other specify_____

3. Have you heard about birth plan?

☐Yes

☐No

If yes who informed you about birth plan:

☐Health care personnel ()

☐TBA ()

☐Other specify_____

4. Where are you planning to deliver your baby?

☐Health facility

☐Home with assistance of a SBA

☐Home with assistance by a TBA

☐Home with assistance of others, namely?_____

☐Other place, namely?_____

5. If you are choosing to deliver your baby in a health care facility, who informed you about the importance of delivering in a health facility?

☐Health care personnel ()

☐TBA ()

☐Other namely_____

6. According to you, are there any barriers to skilled birth care?

☐Yes

☐No

If yes, which ones?

A. Problems with accessibility to health facilities, due to;

☐Poor terrain,

☐Long distance from the health facility

☐Financial incapability.

☐Unfriendly health care personnel

C. INFORMATION ON EXCLUSIVE BREAST FEEDING

(a) Questions about knowledge of mothers towards exclusive breast feeding		
Question	Response	Remark
7. Do you know about exclusive breast feeding?	☐ Yes ☐ No	
8. Who informed you about exclusive breast feeding?	☐ Health care personnel ☐ Traditional birth attendant ☐ Others, namely?.....	
9. What is the right time to give breast milk to your baby after delivery?	☐ After giving some water, traditional ☐ Within an hour ☐ After one hour ☐ After 24 hours	
10. Who informed you about the right time to breast feed your baby after birth	☐ health care personnel ☐ Traditional birth attendant ☐ Others, namely?.....	
11. What do you do with the first milk or colostrum?	☐ Should be expressed and discarded ☐ Should be fed to the baby immediately after birth	
12. According to you, what is the right time to start giving the child other feeds, other than breast milk	☐ 3 months or less ☐ 4 months ☐ 5 months ☐ 6 months ☐ 7 months or above	
13. Who informed you about the feeds to be given to a child aged below 6 months?	☐ health care personnel ☐ Traditional birth attendant ☐ Others, namely?.....	
14. What are the foods and/or fluids that should be given to a child under 6 months?	☐ Only breast milk ☐ Breast milk and/or plain water, traditional medicine ☐ Infant formula food or animal milk (cow's, goat's, camel's)? ☐ Others (specify)	
15. Is pre-lacteal feeding needed for an infant before starting breast milk?	☐ Yes ☐ No ☐ I do not know	

16. Is breast milk alone being enough for an infant during the first 6 months of life?	☐ Yes ☐ No ☐ I do not know	
17. Is exclusive breast feeding for the first 6 months used to prevent diarrheal and respiratory diseases for the infant?	☐ Yes ☐ No ☐ I do not know	
18. Who gave you information about question 14-17	☐ health care personnel ☐ Traditional birth attendant ☐ Others, namely?.....	

Respond to the following statements as seems fit to you

b. Questions related to attitude of mothers towards exclusive breast feeding		
Question	Response	Remark
19. Giving breast milk for a new-born immediately within an hour after birth is important?	☐ Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree	
20. Discarding the first milk or colostrum is important before giving breast milk to a new-born?	☐ Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree	
21. Giving a child of three months only breast milk may not be sufficient and a child needs water and other fluids to prevent thirst?	☐ Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree	
22. Starting complementary foods to a child before six months is important?	☐ Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree	

Questionnaire modified from (Alamirew *et al.*, 2017)

D. INFORMATION ON POSTPARTUM FAMILY PLANNING

23. Have you heard about postpartum family planning?

☐Yes

☐No

If yes, who informed you about postpartum family planning?

☐Health care personnel ()

☐TBA ()

☐Other namely_____

24. Can you mention example or some forms of modern family planning methods you know?

25. Are you aware of the benefits of postpartum family planning?

☐Yes

☐No

If yes mention some_____

26. What is your source of information above?

☐Health care personnel ()

☐TBA ()

☐Other namely_____

27. Have you ever used any form of family planning?

☐Yes

☐No

If yes which method/s? _____

28. Are there any barriers to the use of the available modern family planning methods?

☐Yes

☐No

If yes which ones? Mention some_____

Questions related to attitudes of mothers to modern family planning methods

Respond to the following statements as seems fit to you

29. Using a modern family planning method within the first 6 weeks after delivery

☐Strongly agree

☐Agree

☐Disagree

☐Strongly disagree

30. Waiting until a mother resumes her menstruation after delivery

☐Strongly agree

☐Agree

☐Disagree

☐Strongly disagree

31. Using natural/traditional family planning methods, after a mother resumes her menstruation after delivery

☐Strongly agree

☐Agree

☐Disagree

☐Strongly disagree

31. Avoiding the use of modern family planning methods after delivery

☐Strongly agree

☐Agree

☐Disagree

☐Strongly disagree

32. Awareness of side effects of modern family planning methods;

☐Yes

☐No

☐I do not know

33. Awareness of measures taken in case of development of side effects of the modern family planning methods;

☐Yes

☐No

☐I do not know

34. Who is your source of information in 32 and 33 above?

☐Health care personnel ()

☐TBA ()

☐Other namely_____

INFORMATION ON INFANT VACCINATION COVERAGE

Questions on knowledge of IVC

35. Are you aware of child vaccination?

☐ Yes

☐ No

☐ I do not know

36. Do you know the recommended KEPI vaccination schedules?

☐ Yes

☐ No

If yes, state the schedules_____

37. will you take your child for immunization as per KEPI schedule

38. Are you aware of the diseases that children are vaccinated against?

☐ Yes

☐ No

If yes mention them_____

39. Who is your source of information in numbers' 35-37 above

☐ Health care personnel ()

☐ TBA ()

☐ Other namely_____

Questions related to mothers' attitudes towards infant vaccination coverage

Respond to the following statements as seems fit to you

40. Immunization of children as per KEPI schedules is mandatory for a child

☐ Strongly agree

☐ Agree

☐ Disagree

☐ Strongly disagree

41. A child will be protected from immunizable diseases as long as he/she has received some of the vaccines, from one or two visits.

☐ Strongly agree

☐ Agree

☐ Disagree

☐ Strongly disagree

42. According to you what are some of the barriers to complete child vaccination

☐ Problems with accessibility to the services due to, distance to the health care facility, poor terrain, poor means of transport to the health care facility.

☐ Unfriendly health care providers

☐ Traditional beliefs about immunization of children

☐ Religious beliefs about vaccination of children

☐ Others

☐ Don't know

Appendix IV: Curriculum for Traditional Birth Attendants Training

- Objectives**
1. To make traditional birth attendants in West Pokot County become aware of promotion of maternal, new-born and child health.
 2. To sensitize women and the community on the health promotion strategies that promote maternal and child health in West Pokot County.

Purpose/Aim

To increase awareness and use of maternal and child health promotion strategies and improve maternal and child health outcomes in West Pokot County.

Contents

The outline of maternal and child health in West Pokot County -what are maternal and child indicators, how does this affect health and development of individuals in the County; Messages on skilled birth care, Exclusive breast feeding, postpartum family planning and infant immunization coverage, Vitamin A supplementation and Deworming

Mode of delivery: lecture and PBL

Materials to be used: computer (laptop), LC-projector, posters with pictures.

Sources: The tool is modified from The Kenya's MoH CHV training manual 2013

Day 1

The role of Traditional Birth Attendants in maternal, new-born and child health

-Who is a Traditional Birth Attendant- in the Pokot community of West Pokot County?

-Other roles that Traditional Birth Attendants can play in the community to promote maternal and child health in West Pokot County.

Messages on: Health promotion and disease prevention; cleanliness and hygiene

Role plays

Health Promotion

Health promotion is the process of enabling people to increase control over, and to improve their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is therefore seen as a resource for everyday life, and not the objective of living.

Health is a positive concept emphasizing social and personal resources as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond health lifestyles to well-being.

Importance of Health Promotion

Helps communities and individuals realize health and health services are human rights for everyone

- Learn how to live a healthy life and avoid diseases.
- Improve the health status of individuals, families, communities, states, and the nation
- Enhance the quality of life for all people
- Importance of availability and access to quality food throughout the year for improved health
- Reduce premature deaths
- Reduces the costs (both financial and human) that individuals, employers, families and the nation would spend on medical treatment
- To care about their own health and take part in organizing health services and disease control programmes.

Focused Antenatal care (FANC): This is personalized care provided to a pregnant woman which emphasises on the woman's overall health, her preparation for child birth and readiness for complications (emergency preparedness).

Individual Birth Plan (IBPs): These are plans that help a pregnant woman prepare a birth plan, that is, what to do when the time comes. They enable the mother to:

Know When her baby is due, Identify a skilled birth attendant, Identify a health facility for delivery/emergency, Identify the danger signs in pregnancy and delivery and know what to do if they occur, Identify a decision-maker in case of emergency, know how to get money in case of emergency, have a transport plan in case of emergency, Have a birth partner/companion for the birth, Collect the basic supplies for the birth.

Before a woman conceives, Due to the changes that takes place in the body of a woman, some of them may expose the woman to various risk factors as follows:

1. Physical Characteristics leading to risk/danger during the pregnancy:
 - Age: younger than 15 yrs and older than 35 yrs,
 - Height: Shorter than 5ft (1.5m) and
 - Weight: Weight less than 45 kg before pregnancy and overweight
2. Social Characteristics: Poor families, rural place that is far from health facility
3. Problems in a Previous Pregnancy: When women have had a problem in last pregnancy, they are more likely to have the problem again. Such problems include a premature/underweight baby, a previous miscarriage, previous caesarean section, and still birth.

A TBA, should: encourage mothers to do the following:

- ✓ Attend antenatal care as soon as she realizes she is pregnant and make at least four focused ANC visits before delivery.
- ✓ Have her weight monitored during pregnancy: expected weight gain is between 12 Kilograms to 15 Kilograms from the first to the last trimester
- ✓ Ensure that she gets Vitamin A supplementation within 4 weeks after delivering from the health facility
- ✓ Sleep under insecticide treated mosquito nets LLITNs to prevent malaria

- ✓ Identify a birth companion and to have an individualized birth plan
- ✓ Seek skilled care at the time of delivery and afterwards
- ✓ Mother should know danger signs in the newborn
- ✓ Utilize the PMTCT services during ANC as it decreases numbers of HIV infected children/increases child health and survival and prevents HIV transmission
- ✓ Involve fathers/male partners in taking care of the children and reproductive health in the family

Day 2

Messages on: Skilled Birth Care

Skilled birth attendance is the delivery conducted by a trained personnel member (doctor, nurse, midwife, clinical officer) in a safe environment using sterilized equipment/ instruments in a health facility or at home (community midwives).

Dangers of unsafe delivery, for example delivery at home without assistance of a professional: birth injury of both mother and the neonate, infections which may affect both the mother and the new-born, excessive bleeding that may complicate to maternal and new-born deaths. Because of these health problems a pregnant woman should deliver, if possible, in a health facility, with assistance of a skilled health professional.

Care after delivery (post-natal care)

This is the care given to both mother and baby from birth in order to reduce complications and deaths as well as to promote health of the mother and baby. This period starts from delivery up to 42 days after delivery (6 weeks).

CHVs should make three postnatal home visits, within 24 hours (Day 1), after 3 days, and after 7 days, to check on danger signs on mother and newborn, regardless of place of delivery.

Postnatal mothers should attend post-natal care for cervical cancer screening, for family planning, and repeat HIV test.

Care for the new-born

Keep the baby warm

- Keeping the room warm where the baby is (Explain carefully to avoid carbon monoxide poisoning and suffocation from burning wood and paraffin stoves)

- Drying the baby as soon as the baby is born

- Keeping the baby in skin-to-skin contact with the mother (on mother's abdomen or chest) with a sheet or blanket covering them (Kangaroo care).

- Putting the baby to the breast as soon as the cord is cut

- Not bathing the baby on the day of birth. If a bath is unavoidable, the baby should be bathed with warm water and dried and wrapped immediately

- Comfortable warm clothing (Hat, socks, wrapping baby).

Importance of cord care

Cord can be an entry point for germs. The cord should be kept clean and dry. And nothing should be applied on it. It should not be covered by then applies as these may introduce germs

Day 3

Messages on: Exclusive Breastfeeding

Nutrition for Newborn and Childhood

What is Early initiation of Breastfeeding?

This means putting the baby on breastmilk within one hour of birth

What is Exclusive breast feeding: This means giving infant only breastmilk and no other food or drink, not even water whenever the baby wants for the first 6 months with the exception of prescription medicine.

Important Note.

- ✓ Babies should be put to breast within 1 hour of delivery.
- ✓ Babies should only be breastfed (no other foods, not even water) for six months.
- ✓ Exclusive breastfeeding is important because breast milk alone has all that the baby needs to grow during the first six months of life and it also protects the baby against infections.
- ✓ Babies born to HIV mothers should be exclusively breastfed with appropriate ARVs for both mother and baby

Feeding the child after 6 months (complementary feeding)

What is complementary feeding?

This means giving other foods in addition to breast milk. During the period of complementary feeding, a baby gradually becomes used to eating family meals. Complementary feeding is done gradually between 6 to 24 months and involves the introduction of one food at a time. At around the age of 2 years, the baby becomes used to family foods which can entirely replace breast milk, although the child may still breastfeed.

Age	Complementary feeds
6month–1year	Breastfeed +3 meals per day
1year–2years	Breastfeed +3 main meals +2 snacks*per day
2years–5years	3 main meals +2 snacks*+2 cup of milk*per day

Day 4

Messages on: Postpartum Family planning

Child spacing is a practice of waiting between pregnancies. A woman's body needs to rest between pregnancies. After having a baby it's a good idea to wait at least 18 months before getting pregnant again. To maintain the best health for her body and her children

There are variety of contraceptive methods to help prevent an unplanned pregnancy. Some are natural, non-hormonal and hormonal. Each method has strengths and weaknesses as follows			
Method	Description	Strengths	Weaknesses
Intrauterine device IUD	Fitted into a woman's uterus. It irritates the lining of the womb so that a fertilized egg cannot grow	effective One time procedure Sex able to be spontaneous	Requires healthcare provider to insert Does NOT prevent against STIs/HIV Requires removal to become pregnant
Contraceptive implant	Small match stick device inserted under the skin that releases hormones over the years	Effective One-time procedure Sex able to be spontaneous	Requires healthcare provider to insert Does NOT prevent against STIs/HIV Requires removal to be pregnant
Oral contraceptive Pills	Pills that contain hormones. Taken	effective when taken daily	Must remember to take each day

	daily to prevent eggs from growing	Sex able to be spontaneous Can reduce menstrual pain and bleeding	Does NOT prevent against STI and HIV
Injectable contraceptives	Injections of hormones that protect against pregnancy for several months	Very effective Does not require daily use Sex able to be spontaneous	Requires repeat injections May have side effects Does not prevent against STI and HIV
Male condom	A thin latex tube that is rolled over an erect penis before it enters the vagina	Effective if used correctly Provides protection against STIs and HIV	Must use for every sex act Requires partner cooperation
Female condom	A plastic pouch inserted into the vagina before sex	Effective Provides protection against STIs and HIV	Must use for every sex act Requires partner cooperation
Diaphragm	Soft rubber dome stretched flexible ring. It is inserted into the vagina and placed over the cervix before sex	effective if used correctly with spermicides Has no hormonal effects	Must use for every sex act Requires visit to healthcare provider Does NOT protect against STIs or HIV

Natural or non-medical FP methods

Method	Description	Strengths	Weaknesses
Abstinence	Voluntary abstaining from sex	Completely effective Prevents STIs and 11 HIV	Requires commitment
Breast feeding exclusively or Lactational Amenorrhoea Method (LAM)	Mother exclusively breastfeeds her child during the 1 st six months of life. Need to feed frequently during the day and especially at night.	Effective if mother has no monthly bleeding and if used with another method such as a condom	Does NOT protect against STIs/HIV
Fertility awareness or Natural Family Planning (NFP)	Periodic abstinence (7-10 days) during the most fertile time of a woman's menstrual cycle. Requires recording body	Effective if used with another method like condom	Does not protect against STIs/HIV Requires woman to be aware of

	temperature and checking vaginal mucous secretion.		and attentive to her body
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Day 5

Messages on: Infant Vaccination Coverage

Immunization for children

Children should be immunized to prevent immunizable diseases.

Immunization schedules

Date	Vaccinations	Disease/s
At birth	BCG and Birth Polio (up-to 2 weeks)	TB, Polio
6 weeks	OPV1, PENTA1, PCV1,	Diphtheria, Pertussis, Tetanus Pneumonia/ Meningitis/ Otitis Media Bacteraemia
10weeks	OPV2, PENTA2, PCV2,	Diphtheria, Pertussis, Tetanus Pneumonia/Meningitis/ Otitis Media Bacteraemia
14weeks	OPV3, PENTA3, PCV3,	Diphtheria, Pertussis, Tetanus Pneumonia/ Meningitis/ Otitis Media Bacteraemia
9months	Measles/ Yellow Fever	Measles, Yellow Fever

Note: Ensure every child receives required vaccinations by the first birthday

Vitamin A supplementation and deworming

Vitamin A supplementation

Vitamin A is important for a healthy immune system and for growth and development of children. Children with vitamin A deficiency are more likely to suffer from infections such as measles, diarrhoea and malaria than healthy children.

In addition to the vaccination, a child needs to be given Vitamin A from 6 months of age, twice per year until they reach age 5. Vitamin A also helps the body use iron and for good eyesight.

Vitamin A supplementation Schedule	
6 month –11 months	Vitamin A 100,000IU (international unit): blue capsule
12 month –5 years	Vitamin A 200,000IU (international unit): red capsule*

Deworming

Deworming is done to all children above 1 year at 6month intervals up-to 5 years. Dose of deworming (Albendazole):

- ☐ 1 to 2years: 200mg once.
- ☐ Above 2years:400mg once.

Deworming twice a year to maintain appetite, enhance nutrient as simulation and food efficiency in the body.

Day 6: Discussion and Feed back

The TBAs and the Researcher

Day 7. Community mobilization on the need to continue compensating the tba as they help mothers utilize Birth plan, SBC, EBF, PPFP AND IVC.

This will be done on a baraza

Appendix V: NACOSTI Research Permit

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014.

CONDITIONS

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the licensed research project.
7. The Licensee shall submit one hard copy and upload a soft copy of their final report within one year of completion of the research.
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice.

National Commission for Science, Technology and Innovation
P.O. Box 30623 - 00100, Nairobi, Kenya
TEL: 020 400 7000, 0713 788787, 0735 404245
Email: dg@nacosti.go.ke, registry@nacosti.go.ke
Website: www.nacosti.go.ke

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH LICENSE

Serial No.A 26114

CONDITIONS: see back page

Appendix VI: IREC –MTRH/Moi University Letter of Approval

 MU/MTRH-INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC) MOI TEACHING AND REFERRAL HOSPITAL P.O. BOX 3 ELDORET Tel: 334711/2/3 Reference: IREC/2018/323 Approval Number: 0003335	 MOI UNIVERSITY COLLEGE OF HEALTH SCIENCES P.O. BOX 4006 ELDORET 30 th May, 2019
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Benadette C. Kaprom,
Jomo Kenyatta University of Agriculture & Technology,
School of Public Health,
P.O. Box 62000-00200,
NAIROBI-KENYA.

Dear Ms. Kaprom,

RE: FORMAL APPROVAL



The MU/MTRH- Institutional Research and Ethics Committee has reviewed your research proposal titled: -

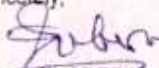
"Effects of Traditional Birth Attendant's Led Health Education Intervention on Selected Maternal and Child Health Indicators in West Pokot County".

Your proposal has been granted a Formal Approval Number: **FAN: IREC 3335** on 30th May, 2019. You are therefore permitted to begin your investigations.

Note that this approval is for 1 year; hence will expire on 29th May, 2020. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date. You will be required to submit progress report(s) on application for continuation, at the end of the study and any other times as may be recommended by the Committee.

Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. You will also be required to seek further clearance from any other regulatory body/authority that may be appropriate and applicable to the conduct of this study.

Sincerely,


DR. S. NYABERA
DEPUTY-CHAIRMAN
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE

cc	CEO	-	MTRH	Dean	-	SOP	Dean	-	SOM
	Principal	-	CHS	Dean	-	SON	Dean	-	SOD

Appendix VII: Research Authorization by County Commissioner Office of West Pokot County


THE PRESIDENCY
MINISTRY OF INTERIOR AND COORDINATION
OF NATIONAL GOVERNMENT

Telegrams: "DISTRICTER"
COUNTY COMMISSIONER
Telephone
Email: ccwestpokot@gmail.com

County Commissioner
West Pokot County,
P.O BOX 1-30600,
KAPENGURIA.

REF: OOP.CC.ADM.15/14 VOL.1/283

20TH AUGUST, 2019

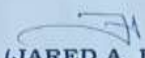
TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION
MS. BENADETTE CHEPKOMOR KAPROM

Reference is made to the Director/CEO, National Commission for Science, Technology and Innovation's letter Ref. No. NACOSTI/P/19/50702/31606 of 25th July, 2019 on the above subject.

This is to inform you that the above named person, who is a student from Jomo Kenyatta University of Agriculture and Technology, has been duly authorized to carry out research on ***"Effect of traditional birth attendants' led health education intervention on selected maternal and child health indicators in West Pokot County - Kenya"*** for the period ending 25th July, 2020.

The purpose of this letter therefore, is to request you to accord her your cooperation, guidance and necessary assistance she may require during her tour of research within West Pokot County as mentioned above.


(JARED A. RATEMO) 0 AUG 2019
FOR: COUNTY COMMISSIONER
WEST POKOT COUNTY KAPENGURIA

CC

COUNTY DIRECTOR OF EDUCATION
WEST POKOT COUNTY

Appendix VIII: First Publication

February 2024

EAST AFRICAN MEDICAL JOURNAL

6731

East African Medical Journal Vol. 101 No. 2 February 2024

EFFECTIVENESS OF TRADITIONAL BIRTH ATTENDANTS'-LED HEALTH EDUCATION INTERVENTION ON EXCLUSIVE BREASTFEEDING IN WEST POKOT COUNTY, KENYA.

Benadette Chepkomor. Kaprom, School of Public Health, College of Health Sciences, Jomo Kenyatta University of Agriculture and Technology, P. O. Box 6200-00200, Nairobi, Kenya, Kenneth Ngure, Associate Professor, School of Public Health, Jomo Kenyatta University of Agriculture and Technology, P. O. Box 6200-00200, Nairobi, Kenya, Doctor Susan Njoki Mambo, Lecturer, Department of Environmental Health and Disease Control, School of Public Health, Jomo Kenyatta University of Agriculture and Technology, P. O. Box 6200-00200, Nairobi, Kenya.

Corresponding author: Benadette Chepkomor. Kaprom, School of Public Health, College of Health Sciences, Jomo Kenyatta University of Agriculture and Technology, P. O. Box 6200-00200, Nairobi, Kenya. Email: bkaprom@gmail.com

EFFECTIVENESS OF TRADITIONAL BIRTH ATTENDANTS'-LED HEALTH EDUCATION INTERVENTION ON EXCLUSIVE BREASTFEEDING IN WEST POKOT COUNTY, KENYA

B. C. Kaprom, K. Ngure and S. Mambo

ABSTRACT

Objective: The aim of this study was to assess effect of traditional birth attendants (TBAs)-led health education intervention on practice of exclusive breastfeeding (EBF) in West Pokot County, Kenya.

Design: Quasi experimental design was used.

Setting: The study was carried out in rural part of West Pokot County.

Research participants: Expectant women aged 15-49 years.

Intervention: Training of TBAs on practice of EBF. TBAs were assigned to expectant mothers to educate them on benefits of EBF and encourage them to practice EBF for the 1st 6 months after delivery.

Outcome measures: Chi-square test was used to determine difference on EBF practices among mothers in intervention and control arms. Binary logistic regression was used to estimate the likelihood of EBF practice during the 1st 6 months of life between intervention and control arms.

Results: From the 338 (177 control arm and 161 intervention arm) study participants at end-line, the mean age (in years) was 26.2±2.7 and 26.9±5.9 for control and intervention arms respectively. Majority 88.2% (control) & 91.3% (intervention) of participants were married. Slightly above average 104(58.757%) from control arm had no formal schooling & 95 (59.006%) from intervention had up to primary level of schooling respectively. Most mothers in intervention 152(95%) practiced EBF compared to 41(23.3%) in control arm ($\chi^2=176.267$, $p<0.001$). Those in the intervention were almost 63 times more likely to practice EBF than those in control; Unadjusted Odds Ratios (UOR; 62.561; 95%CI: 28.330-138.152)

Conclusion: More mothers practiced EBF in intervention arm, than did those in control arm. As such, TBAs-led intervention had positive effect on EBF practice.

INTRODUCTION

Exclusive breastfeeding (EBF) is a practice where an infant is only fed on breast milk without any additional food or drink, not even water (1). Breastfeeding provides ideal feeding for an infant (1), with proven benefits of healthy growth and development (1). On a population basis, EBF for the first 6 months is the optimal way of feeding infants (2) Beyond the 6-month period, infants may receive nutritious complementary foods alongside breastfeeding up to 2 years of age or beyond (3).

Currently(2021) the global EBF rate is 44%, which is still low (4). However, this is a slight improvement from 40% in the previous years (5). Some 23 countries have commendable rates of 60% or more (5), including Kenya, with 61%. Nonetheless, certain parts of Kenya have severely low rates, including West Pokot County, where the rate is 26.4%. (6)

Breastfeeding has cognitive and health benefits for infants (7). Breast milk helps prevent infant diarrhoea and pneumonia in this age group (cite). Besides, mothers who breastfeed have a reduced risk of ovarian and breast cancer (4,5). To enable mothers establish and sustain EBF for the first 6 months, initiation of breastfeeding within the first one hour after delivery is recommended(8). EBF has been found an important determinant in prevention of maternal and child morbidities and mortalities especially in developing countries where more than 30 million deaths of children are due to sub-optimal breastfeeding (9). While breastfeeding is a natural act, it is also a learned behaviour, and mothers and other caregivers require active support to establish

and sustain appropriate breastfeeding practices (10)(cite). Such support includes the WHO and UNICEF backed baby-friendly hospital initiative (BFHI) to strengthen maternity practices to support breastfeeding (4). The BFHI has been implemented in about 16,000 hospitals in 171 countries and it has contributed to improving the establishment of EBF worldwide(11). Lessons from BFHI show that improved maternity services help to increase the initiation of EBF, nevertheless, support throughout the health system is required to help mothers sustain exclusive breastfeeding(12). This means support even from community members like TBAs who play a key role on maternal and child health care, who are recognized, trusted and respected among rural communities, such as those living in the very remote areas(13).

Another maternal support initiative is the Integrated Management of Childhood Illness (IMCI) (14) (cite). This initiative has the basic breastfeeding support skills are part of the 11-day training course, done by first-level health care workers (4). Evaluation of breastfeeding counselling, delivered by health professionals as well as CHPs has shown that this is an effective intervention that can improve EBF rates (4).

The current study borrows from the foregoing approach combining and evaluating support efforts from both community members and health care workers to promote EBF among mothers in remote rural areas of West Pokot County where the rate is about 26.4% (6).

METHODOLOGY

Study design

The study employed quasi experimental design comprising two groups, one of an intervention arm, and the other being control arm. In the intervention arm, mothers were exposed to a TBAs'-led intervention on EBF practice. On the other hand, in control arm, mothers did not receive TBAs-led intervention; instead, they continued receiving the available standard EBF practices information from the local ministry of health services. At the beginning of the study, a survey which involved recruitment of research participants was conducted, and at the end of the intervention; an end-line survey on the practice of EBF for the first six months was done.

Study site

The study was part of a larger study, conducted in West Pokot County (2019 to 2021). According to the 2009 Kenya Housing and Population Census, West Pokot County had a population of 512,690 and was estimated to 777,180 in 2018 (15). West Pokot County is predominantly a pastoral area. The study involved two of the four sub-counties, namely Pokot South (Kipkomo) and Pokot North Sub-Counties.

The study participants were women aged between the age of 15 to 49 years, residing in Pokot North sub-county (control site) and Pokot South Sub- County (intervention site) who were expectant at the time of recruitment. This study used purposive sampling technique when recruiting study participants. This is because of the nature of the study which required that research participants were expectant mothers receiving services from TBAs' during their time of pregnancy. The sample size was calculated using the equation for comparative epidemiological studies(16). The sample size was 161 in the intervention arm and 177 in the control arm of the study.

Data collection

Data which was self-reported by the research participants was collected using semi-structured questionnaires. The interviews took place within the communities in both sites either at the homesteads of the participants, or at health care facilities (at the participants' convenience). In the intervention arm of the study, research participants were recruited with the help of TBAs and community health volunteers (CHVs). In this arm, expectant mothers were given health education on EBF of babies, the 1st 6 months by TBAs who had earlier been trained on EBF practice. In the control arm, expectant mothers with similar characteristics as those in the intervention arm were recruited with the help of CHVs. In this arm, there was no TBA-led intervention on EBF; instead, mothers received MOH's standard care services and child health information as usual. At the end of the study, assessment on the practice of EBF was done, to confirm practice of EBF.

Data analysis

Completed questionnaires from the study were coded and exported to SPSS, Version 24, for analysis. Descriptive statistics were used to summarize data. Chi-square test was used to determine if there is significant difference on the practice of EBF on the proportions of mothers in intervention and control arms of the study. Binary logistic regression was used to estimate the likelihood of practice of EBF between intervention and control arms. The effect size was determined by use of odds ratios at 95% significance interval.

Ethical considerations

Permission was sought from the West Pokot County commissioner's office. Research participants were recruited on voluntary basis and given informed consent forms to affirm their voluntary willingness to participate in the study. To ensure anonymity, research participants were not to write their names

anywhere on the research tools. The protocol of the study was approved by the Moi University and Moi Teaching and Referral Hospital (MTRH)'s independent research

ethics committee (IREC), reference number: IREC/2018/323, Approval Number: 0003335. Clearance was also obtained from NACOSTI permit number; NACOSTI/P/19/50702/31606.

RESULTS

Table 1
Socio-demographic characteristics of research participants

	Baseline			
	Control		Intervention	
Level of Education	F	%	F	%
No formal education	92	45.1	40	19.6
Up to primary level	79	38.7	133	65.2
Secondary and above	33	16.2	31	15.2
Religion				
Protestant	92	45.1	84	41.2
Catholic	86	42.2	82	40.2
Others	32	15.7	38	18.6
Employment				
Employed	82	40.2	87	42.64
Un employed	122	59.8	117	57.4
Main source of food				
Home gardening and animal rearing	188	92.6	189	92.6
Buying food from the market	16	7.8	15	7.4

Key: F; frequency

At end-line, the study found a statistically significant higher proportion of mothers practicing EBF in intervention arm (99.4%), compared to 60.8% in control arm (p-value<0.001), as shown in Table 1. In addition, participants in intervention arm were knowledgeable on timing of when to initiate

breastfeeding after birth (within 1 hour postpartum) compared to those in control arm. In terms of when weaning should be initiated, 153 (95%: 95% CI: 90.4, 97.8) reported it to be after six months in intervention arm while 41 (23.3; 95% CI: 17.3, 30.2) reported the same period in the control arm. The difference was statistically significant (p-value<0.001).

Table 2
The practice of Exclusive Breastfeeding

Variable	Control (N=177)	Intervention (N=161)	Total (N=338)	p value
Know EBF				0.001 ¹
N-Miss	1	0	1	
No	69 (39.2%)	1 (0.6%)	70 (20.8%)	
Yes	107 (60.8%)	160 (99.4%)	267 (79.2%)	
Right time to initiate breastfeeding				0.001 ¹
N-Miss	1	0	1	
After giving some water	34 (19.3%)	3 (1.9%)	37 (11.0%)	
Within an hour	125 (71.0%)	153 (95.0%)	278 (82.5%)	
After one hour	16 (9.1%)	5 (3.1%)	21 (6.2%)	
After 24 hours	1 (0.6%)	0 (0.0%)	1 (0.3%)	
Baby require other feeds before breastfeeding initiation				0.001 ¹
N-Miss	1	0	1	
No	107 (60.8%)	152 (94.4%)	259 (76.9%)	
Yes	69 (39.2%)	9 (5.6%)	78 (23.1%)	

Pearson's Chi-squared test

Key: 1, 0: none response

Table 1 depicts that majority of research participants (99%) from the intervention arm knew about EBF and even the right time to initiate breastfeeding after delivery. In addition, majority of participants (94%) from intervention arm seemed to agree that babies do not need other feeds before initiation of breastfeeding, compared to about 61% of those from the control arm.

Table 3
Bivariate analysis showing an association between practices of EBF and the group

Strategy	Group		Chi-value/t-value	P-value
	Control	Intervention		
Practice of EBF for the 1st 6 months of an infant				
Started giving child other feeds, other than breast milk				
Before six months	135(76.704%)	8(4.969%)	176.267	<0.001
After six months	41(23.295%)	153(95.031%)		

UOR; 95%CI: 62.561; 28.330-138.152)

Table 3 shows higher proportion of mothers in the intervention group (94.409%) reported to introduce other foods to their baby after six months, meaning they practised EBF for the

first 6 months compared to merely 23.164% in the control group ($\chi^2 = 176.267$, $p = 0.001$). Since $p < 0.05$, we therefore conclude that there is a significant difference in the odds of mothers practicing exclusive breastfeeding

(EBF) between the intervention and control groups. Those in the intervention group were almost 63 times more likely to practice exclusive breastfeeding before six months compared to those in the control group (UOR: 62.561; 95% CI: 28.330-138.152).

Table 4

Multivariate analysis showing various factors associated with the practice of Exclusive Breastfeeding

Variable	UOR	95% CI	p-value	AOR	95% CI	p-value
Arm/group						
Control	1			1		
Intervention	62.6	29.9, 149	0.001	67.6	26.2, 203	0.001
Age	0.98	0.95, 1.02	0.400	0.97	0.87, 1.09	0.700
Religion						
Catholic	1			1		
Other	1.90	0.92, 4.12	0.191	1.66	0.46, 6.23	0.400
Protestant	0.62	0.38, 0.99	0.095	1.15	0.52, 2.65	0.700
Education						
No education	1			1		
Primary	3.67	2.27, 6.00	0.012	3.74	0.15, 3.60	0.700
Secondary and higher	7.28	3.30, 17.9	0.001	6.89	0.25, 15.0	0.500
Employment						
Employed	1			1		
Unemployed	1.39	0.60, 3.22	0.400	1.45	0.15, 1.42	0.200
Parity	0.87	0.80, 0.95	0.102	0.88	0.67, 1.16	0.400

1: the odds ratios for the corresponding variable

Table 4 indicates, controlling for religion, employment status, group and education level of the mother were significant predictors of the practice of exclusive breastfeeding ($p = 0.001$; $p = 0.012$ and $p = 0.001$) respectively. Those in the intervention group were 63 times more likely to exclusively breastfeed their babies the first six months compared to those in the control group (OR: 62.601; 95%CI: 29.9-149). The results also show that those with primary level of education are 3 times more likely to practice EBF compared to those without any formal education (OR;95% CI: 3.671; 2.272 – 6.001) while those with secondary and above level of education were almost 7 times more likely to

practice EBF compared to those without any formal education (OR: 7.280; 95% CI: 3.301-17.901)

DISCUSSION

In this study, expectant mothers from two sub-counties of West Pokot County-Kenya were recruited to study their practice of EBF. The intervention arm was given health education on EBF by TBAs, whereas those in the control arm of the study received the standard ministry of health's health care services available in the region. The research participants from both study arms were followed until the delivery of their babies and until the babies were over 6 months of age,

after which evaluation was done to note practice of EBF for the first 6 months of age as required by Kenya's ministry of health. From this study, it was noted that when controlling for factors like religion, employment status, it showed that group and level of education were significant predictors for the practice of EBF. Mothers in the intervention group were 63 times more likely to practice EBF compared to those in the control arm of the study (OR: 62.601; 95% CI: 29.9-149). This proves the difference between mothers who received health education from TBAs on EBF of babies for the first six months. These findings were similar to those from India, which found that using TBAs to train mothers on EBF led to increase in early initiation of breastfeeding, high rates of EBF practices and avoidance of pre-lacteal feeding (11). In addition, they found that trained TBAs were likelier than untrained TBAs to advise mothers on good diet and immediate feeding of colostrum to the new-born (17). In the current study, mothers from the intervention site were advised by TBAs to breastfeed their babies within one hour after delivery and continue to exclusively breastfeed their babies for 6 months. Another study also urges mothers to prolong breastfeeding beyond 24 months of the children's age arguing that this would change babies into caring children later in their lives (18). The study goes further to attest the powers of TBA in encouraging mothers to build a positive attitude towards EBF for optimal baby nutrition.

Findings of this study also showed that TBAs promoted early initiation of breastfeeding, as it depicted that majority of mothers (95%) in the intervention arm initiated breastfeeding within one hour after delivery of baby as compared to those in the control arm (71%), though not statistically significant. These findings were inconsistent with those of a

study carried out in Kassena-Nankana Municipality, Ghana. In the Ghanaian study, mothers' intentions to exclusively breastfeed their babies were hampered by some cultural practices promoted by TBAs and other community members including mother-in-laws (19). Such practices include giving of herbal concoctions before initiating breastfeeding and breast milk purification rites. Moreover, it was revealed that TBAs tended to discourage EBF among the mothers (19). Nevertheless, it is unclear if the TBAs in the Ghanaian study were trained on health benefits of EBF and EBF. In contrast, the findings of the current study showed involvement and training of TBAs significantly increased the practice of EBF and EBF in the intervention site. Therefore, training TBAs on the importance and health benefits of EBF can result in many mothers choosing to early initiate breastfeeding and exclusively breastfeed their children for the first 6 months of age.

Similar to observations made in the current study, where TBAs-led-health education intervention improved practice of EBF, a study in Sierra Leone(20), and those from a Bangladesh study also found that a change in practice of EBF was quite significant in the intervention arm ($P<0.05$) where TBAs carried out health promotion activities to promote EBF and EBF for 6 months (21). It further established that involvement of TBAs markedly improved EBF (20). As demonstrated in the current study, TBAs-led health education intervention can significantly improve the practice of EBF in many African rural set-ups like West Pokot County. However, the findings of this study were inconsistent with those of a study by Mohamed and friends in Wajir, Kenya, which revealed that mothers have a positive attitude towards EBF for the first 6 months (22). Despite

these positive attitudes, mothers reported to be discouraged by cultural barriers propagated by family and community members, including TBAs who held the belief that breast milk alone is not enough for the baby during the first 6 months, and that the baby must be given water because they cannot do without it (22). The reasons for such negative advice could be TBAs' ignorance on the health benefits of the practice of EBF.

In the current study, it was therefore deemed important to train traditional birth attendants on the practice of Exclusive Breastfeeding and health benefits it confers to the baby and mother. These TBAs were subsequently directed to educate the mothers in the intervention arm of the study about the practice of exclusive breastfeeding, and even the right time to initiate breastfeeding after the birth of a child, and the health benefits of the practice of EBF for the mother and the child. Previous studies have also shown that apart from baby-friendly hospital initiative (BFHI), there is also baby-friendly community initiatives (BFCI), which has proven to promote practice of EBF(23). This is so because home-based personalized care works since significant stakeholders, such as the baby's father, in-laws and other community members like TBAs work together in the implementation of these initiatives. These are suggestions that concur with the findings of the current study.

CONCLUSION

Traditional birth attendants'-led health education intervention has a positive effect on the practice of exclusive breastfeeding, since majority of mothers in the intervention group exclusively breastfed their infants for the first 6 months after delivery. The study therefore recommends that Traditional Birth Attendants, be recognized especially in rural

set-ups and be allowed to play the role of championing for maternal and child health care practices such as exclusive breastfeeding within communities where they live, are recognized and respected by the members. At the County level, County government should ensure implementation and monitoring of adult education, to increase literacy levels of mothers in the rural areas of West Pokot County, since the study findings has showed that EBF practice is also increased with increase in level of education of mothers.

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Appendix IX: Second Publication

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Original Research Article

Effect of traditional birth attendants-led health education intervention on utilization of skilled birth care in West Pokot County, Kenya

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ABSTRACT

Background: Globally, between 2000 and 2017, maternal mortality ratio declined by 38%, with global lifetime risk of maternal death falling from 1 in 73 to 1 in 180, respectively. In West Pokot County, Kenya, over half of deliveries are managed by traditional birth attendants. The study investigated the effect of TBAs-led intervention on utilization of skilled birth care in this County.

Methods: The study employed a prospective experimental design. In the intervention arm, TBAs were recruited and trained on SBC. They were assigned expectant mothers and followed until they delivered their babies. Chi-square test was used to determine the relationship between variables. Binary logistic regression was used to compare utilization of SBC between the intervention and control sites.

Results: Majority of mothers (95%) in the intervention arm of the study went for TBAs' services, and 79.5% of those in the control did the same. Most mothers in the intervention (81.4%) delivered in health care facility compared to 58.2% in the control ($\chi^2=21.256, p<0.001$). There was a significant difference in the odds of mothers utilizing SBC between intervention and control groups. Those in the intervention group were almost 3 times more likely to utilize SBC than those in the control group (UOR; 95% CI: 3.137; 1.909-5.155).

Conclusions: TBAs-led intervention increased utilization of SBC among mothers in the intervention compared to those in the control arm who utilized available ministry of health's standard care.

Keywords: Traditional birth attendants, Skilled birth care, Traditional birth attendants-led intervention, Maternal and child health

INTRODUCTION

The world health organization (WHO) vision, moving beyond 2015, which envisions a world where every pregnant woman and new-born receives quality care throughout pregnancy, childbirth and the postnatal period,

is in alignment with two complementary global action agenda conceptualized by WHO and partners in 2013-2014 strategies, namely towards ending preventable maternal mortality (EPMM) and every new-born action plan (ENAP). This strategy is articulated at a critical time when the global community is developing the new global strategy for women's, children's and adolescent's health

(2016-2030) for the post-2015 sustainable development goal (SDG) era.¹ Over 70% of maternal deaths occur because of complications related to pregnancy and childbirth. Effective care to prevent and manage complications during this critical period is likely to have a significant impact in reducing maternal deaths, stillbirths and early neonatal deaths.¹

WHO recommends skilled birth care with the help of a skilled birth attendant as one of the critical strategies, among other interventions, to reducing maternal and neonatal/child morbidities and mortalities in both high income and low-income countries.² Globally, several studies have been carried out with regards to interventions involving traditional birth attendants (TBAs) to improve utilization of skilled birth care. For instance, the study findings of Jiang and colleagues in China support the utilization of skilled birth care during childbirth. Based on their findings, the authors proposed an institution-based childbirth policy for rural areas, which became a cornerstone of a new national safe motherhood policy in China.³ In this policy, the role of traditional birth attendants, was transformed. TBAs were directed to discontinue home delivery and advocate for health institution-based childbirth as well as assist with maternal health care as village maternal health workers (VMHW). Therefore, China successfully integrated TBAs into the health system in rural regions with the goal of universal access to skilled birth care. As a result of this, China was able to achieve the millennium development goal (MDG) 5a, so that, by 2015, the country recorded a maternal mortality ratio (MMR) of 23/100,000 live births.³ The present study draws insight from the reviewed work to find ways to ensure West Pokot County realizes the aspirations of reducing maternal mortality through the adoption of skilled birth services.

In Kenya, maternal mortality ratio stood at 362/100,000 live births and West Pokot County 565/100,000 live births,⁴ and infant mortality ratio of 37.1 deaths/1000 and 81 deaths/1000 live births in West Pokot County, respectively.⁴ Similarly, in Kenya, SBC usage stands at 89.0%, whereas in West Pokot County, SBC use as a health promotion strategy stands at 55.0%.⁵ The high maternal and child mortalities in West Pokot County may be due to poor utilization of skilled birth care. Studies have shown that high-quality obstetric delivery in a health facility reduces maternal and perinatal morbidity and mortality.⁶ Kenya has made notable progress in improving maternal and child health outcomes. Despite this progress, the country could not achieve the MDG for maternal and child health by 2015. This shows that a lot still needs to be done by the government to address demand/supply barriers in the delivery of essential services, like maternal and child health care services, to realize the goals of Vision 2030 and the aspirations of the 2010 constitution. In addition to this, the bill of rights articulates the right to health, including reproductive health.⁷ There is therefore need for innovative intervention to help improve the utilization of SBC,

which may help reduce the maternal and child morbidities and mortalities in West Pokot County. A study reports that pregnant women in the rural areas of most developing countries have a lot of trust in TBAs.⁷ Since most mothers seem to prefer TBAs in this region of Kenya, the study found it important to establish if TBAs could help improve SBC usage in this county.

METHODS

The study was conducted in West Pokot County in Kenya. It involved two of the four sub-counties, namely Pokot South (Kipkomo) and Pokot North Sub-Counties. These sub-counties were purposively selected because of their environmental similarities in the county. The two sub-counties were assigned to being intervention site (Pokot south sub-county) and control site (Pokot north sub-county) by use of simple random sampling procedure. The study population were women of child-bearing age (15-49 years) residing in the County. The study was quasi experimental study with two groups: one being the intervention and one control group. The study was carried out between August 2019 and April 2021. At the beginning of the study, we recruited 204 self-reported expectant women who become the research participants from both study arms respectively. In the intervention group, mothers were exposed to a TBA-led health education intervention on utilization of skilled birth care as one of the maternal new born and child health (MNCH) health promotion practice. In the control group, mothers continued to receive the Ministry of Health's current standard care and information on MNCH care with no TBAs-led health education intervention.

In the intervention site TBAs followed the recruited expectant mothers to ensure they delivered through SBC. In the control site, expectant mothers were allowed to receive the usual available standard maternal and child health care and services in the region. At the end of the study, a survey was carried out in both the study arms to note where mothers delivered their babies. The self-reported data was collected with the use of semi-structured questionnaires and verified using mother and child health booklet (purple book), to confirm their utilization of SBC.

Data was collected using semi-structured questionnaires. The interviews took place either at the homesteads of the research participants or local health care facilities within the community where research participants resided. End-line data was verified using mother and baby clinic booklet (purple book), to verify on utilization of SBC. Completed questionnaires from the study were coded and transferred to SPSS Version 24 for analysis. Descriptive statistics were used to summarize these data. Chi-square test was used to determine any significant difference on proportions of utilization of SBC among mothers in the intervention and those in the control groups. To control for any possible confounders, we conducted a multiple logistics regression for factors influencing utilization of

skilled birth care, and to estimate the likelihood of utilization of SBC between the intervention and control sites. The effect size was determined by use of odds ratios (OR) at 95% significance interval. Permission to carry out the study was given by the West Pokot County commissioner's office. Respondents were recruited on voluntary basis and given informed consent forms to affirm their voluntary participation in the study. To ensure anonymity, respondents were advised not to write

their names on the research tools. Study was approved by Moi University and Moi Teaching and Referral Hospital (MTRH)'s independent research ethics committee (IREC).

RESULTS

Socio-demographic characteristics of research participant at baseline are shown in (Table 1).

Table 1: Socio-demographic characteristics of research participants at baseline.

Parameters	Baseline		Intervention	
	Control	%	N	%
Level of education				
No education	90	44.1	60	29.4
Primary level education	84	41.2	108	52.9
Secondary and above	30	14.7	36	17.6
Religion				
Protestant	90	44.1	84	41.2
Catholic	86	42.2	80	39.2
Others	28	13.7	40	19.6
Employment				
Employed	79	39.7	82	40.2
Unemployed	125	61.3	122	59.8
Main source of food				
Home gardening and animal rearing	190	93.1	192	94.1
Buying food from the market	14	6.9	12	5.9

Table 2: Skilled birth care.

Variables	Control (N=177)	Intervention (N=161)	Total (N=338)	P value
Sought TBA services during pregnancy	154 (87.0)	153 (95.6)	307 (91.1)	0.006
Where delivered baby				
Missing	0	1 (0.3)	1 (0.3)	-
Health facility	103 (58.2)	131 (81.37)	234 (69.23)	
Home assisted by TBA	69 (39)	22 (13.7)	91 (26.92)	
Home assisted by others	3 (1.7)	0 (0.00)	3 (0.89)	
Other places	2 (1.1)	7 (4.4)	9 (2.66)	
Helped decide where to deliver				
Missing	0	4 (1.2)	4 (1.2)	-
Healthcare personnel	48 (27.1)	79 (50.3)	127 (37.6)	
TBA	72 (40.7)	68 (43.3)	140 (41.4)	
Other	57 (32.2)	10 (6.4)	67 (19.8)	

The study examined the effect of traditional birth attendants-led health education intervention on utilization of skilled birth care in West Pokot County. At the beginning of the study, expectant mothers (research participants) were asked where they plan to deliver their babies. The responses were: 96.1% and 97.6% in the control and intervention arms desired to deliver their babies in a hospital and utilize skilled birth care services respectively. At the end-line of the study, it was observed that there was a higher proportion of women utilizing skilled birth care in the intervention arm, 131 (81.87%: 95% CI: 75.02, 87.51), compared to those in the control arm, 103 (58.1995% CI: 50.56, 65.55), as shown in table

2 and the difference was statistically significant ($p < 0.001$). In terms of ANC attendance, a similar trend was observed with all the participants in the intervention arm attending ANC during pregnancy and 140 (79.54 95% CI: 72.82, 85.24) in the control arm ($p < 0.001$). Table 1 shows other pregnancy and delivery related variables by arm.

The (Table 1) shows that majority of research participants (81.37%) from the intervention arm delivered their babies at a health care facility compared to 58.2% from the control arm of the study and the difference was statistically significant. Majority of the mothers in the

intervention group (81.4%) reported to have delivered in the health facility, meaning they utilized SBC. In contrast, only 58.2% in the control group ($\chi^2=21.256$, $p<0.001$ delivered their babies in a health care facility). Since

$p<0.05$, we therefore reject the null hypothesis and conclude that there is a significant difference in the odds of mothers utilizing skilled birth care (SBC) between the intervention and control groups.

Table 3: Differences in utilization of skilled birth care between control and intervention groups.

Indicators	Groups		Chi-squared value/t value	P value
	Control	Intervention		
Place of delivery				
Away from health care facility	74 (41.8)	30 (18.6)	21.256	<0.001
In the health care facility	103 (58.2)	131 (81.4)		

UOR: 95%CI: 3.137; 1.909-5.155

Table 4: Factors influencing utilization of SBC: multiple logistics regressions for skilled birth care.

Variables	UOR	95% CI	P value	AOR	95% CI	P value
Arm						
Control	1	-	-	1	-	-
Case	3.25	1.98, 5.42	<0.001	5.60	2.67, 12.4	<0.001
Age	0.96	0.92, 1.00	0.028	1.02	0.94, 1.11	0.700
Religion						
Catholic	1	-	-	1	-	-
Other	0.56	0.28, 1.12	0.10	0.34	0.15, 0.80	0.014
Protestant	0.83	0.49, 1.38	0.500	0.97	0.53, 1.78	>0.900
Education						
No education	1	-	-	1	-	-
Primary	2.66	1.61, 4.44	<0.001	3.89	1.35, 11.7	0.013
Secondary and higher	8.20	3.11, 28.3	<0.001	9.04	2.03, 47.9	0.006
Husband education						
No education	1	-	-	1	-	-
Primary	1.87	1.10, 3.20	0.022	0.30	0.10, 0.84	0.023
Secondary and higher	3.31	1.71, 6.72	<0.001	0.32	0.08, 1.23	0.100
Employment						
Employed	1	-	-	1	-	-
Unemployed	0.75	0.27, 1.86	0.600	0.35	0.10, 1.03	0.066
Parity	0.83	0.75, 0.91	<0.001	0.85	0.70, 1.03	0.100
Income						
≤5000	1	-	-	1	-	-
>5000	1.43	0.86, 2.40	0.200	0.60	0.29, 1.22	0.200

Those in the intervention group were almost 3 times more likely to utilize skilled birth care (SBC) than those in the control group (UOR; 95% CI: 3.137; 1.909-5.155). The (Table 3) presents the findings for the multiple logistics regression. Controlling for religion and employment status, group and education level of the mother were significant predictors of utilization of skilled birth care ($p<0.001$ and $p=0.002$, respectively). Those in the intervention group were 3 times more likely to utilize skilled birth care compared to those in the control group (OR; 95% CI: 3.180; 1.79-5.65). Those with secondary and a above level of education were 6 times more likely to utilize skilled birth care compared to those without any formal education (OR; 95% CI: 6.118; 2.032-18.421).

DISCUSSION

Access to high quality care during pregnancy, labour, delivery, and post-partum period has been shown to

promote positive maternal and neonatal outcomes and very critical to reducing maternal and neonatal mortality.⁸ This need can be addressed by an increase in access to institutional deliveries under the care of a skilled birth attendant.⁹ Access to skilled birth care has been a challenge in developing countries, especially in rural areas of Kenya. This has led to initiation of free maternity policies in public health facilities, yet it is not well documented if this has led to a significant increase in utilization of skilled birth care in these regions¹⁰ and significant reduction on maternal and neonatal morbidities and mortalities.¹¹ The study sought to find out the effect of TBAs-led health education intervention on utilization of skilled birth care (SBC) in West Pokot County, where the prevalence was as low as 27%.⁴ This was a prospective-experimental study comprising intervention and control groups. In the intervention group, TBAs were trained on maternal and child health care and tasked to give health education to expectant mothers on

skilled birthing in a formal health facility, refer them and even accompany them to deliver their babies in these facilities. The findings of the study showed that a majority of mothers in the intervention group (81.1%) delivered their babies in health facility under skilled birth care, with only 13.8% having delivered at home with the help of traditional birth attendants, and 4.4% at other places. This was in comparison to skilled delivery on the control arm of the study where about 58.2% delivered in a health care facility, and assisted by health care providers.

These study findings revealed that mothers in the intervention group were more likely to deliver at a health care facility and utilize skilled birth care services, compared to those in the control arm of the study. This deduction could be proof that more mothers from the intervention site were referred to these health care facilities by the traditional birth attendants, and therefore implied that traditional birth attendants-led health education intervention has a positive effect on and can promote utilization of skilled birth care in rural set-ups. The low level of utilization of skilled birth care in the control arm of the study could be explained by lack of the current intervention in the control arm of the study since mothers in this group utilized the standard available ministry of health's services in the area. These findings were comparable to those of previous works. For example, a case study in rural Guatemala that examined how a training programme on programming implementation, curriculum development, sustainable methodology and how educational partnership with the current national health care system could transform the role of TBAs from cultural practitioners to unique health care providers. In the study, the traditional birth attendants were trained on prenatal clinical skills and, six months post training, there was a significant increase of referrals for skilled maternal and child health services after TBAs were tasked to refer mothers for skilled birth services.¹² TBAs in the Guatemalan study, however, were allowed to perform normal deliveries in the rural areas and referred mothers with signs of complications, which was not the case in the current study where TBAs were only tasked to educate mothers on SBC, encourage and even accompany them to go for skilled hospital delivery services.

The same findings are also consistent with those of studies in Timor-Leste, in Sub-Saharan Africa and in Sierra Leone.¹³⁻¹⁵ In these three studies, traditional birth attendants were trained and rebranded to conduct maternal health promotion-related activities and refer expectant mothers to health facilities for deliveries. This intervention had a significant impact on health facility delivery and 4 or more antenatal care (ANC) visits, especially in the intervention arm where health promotion activities in addition to (business activities) were carried out.¹³⁻¹⁵ Nevertheless, in the current study, there were no business activities for the TBAs in the intervention site. They only provided the mothers with health education messages and ensure they sought skilled birth care in the

nearby health care facilities. Other studies with similar findings were those undertaken in Nigeria-Ondo State-Agbebiye programme.¹⁶ In this Nigerian study, the intervention to improve skilled birth care involving TBAs led to 61.8 percent increase in facility births from 33,077 in 2013 to 53,531 in 2016 and therefore attesting to the positive effect TBAs' involvement has on SBC usage.

In South Sudan, a study analysed the changing role of TBAs in Tirol West-South.¹⁷ In the study, TBAs were directed by the government to refer expectant mothers for hospital delivery since 2014. The study found that after the government directive, many TBAs referred mothers to hospitals for skilled birth care though some deliveries still took place at home. Alaro's study was affirmed in the current study where there TBAs had a positive effect on uptake of skilled birth care. The South Sudan further found factors that facilitated TBAs referral role to include acceptance of the new role of TBAs by the community members, the expectant mothers and the TBAs themselves.¹⁷ These findings were also noted in the current study where TBAs-led health education intervention was implemented, and showed majority of the mothers (about 81%) in the intervention site going for SBC, as opposed to mothers in the control site where slightly above a half of the study participants (58%) went for SBC services. This attested to the fact that engaging TBAs in maternal and child health care, by utilizing them to refer mothers for skilled deliveries in health care facilities and not home deliveries, could increase uptake of skilled birth care in rural set-ups. Indeed, in the current study, TBAs were recognized, trusted and highly accepted by the community members to offer services like child birthing. Therefore, TBAs also became strong agents of educating mothers on the benefits of SBC.

Studies from low-middle-income countries (LMIC) on TBAs and birth outcomes show that about 22% of pregnant women still prefer to deliver their babies at home with the help of a TBA Garces et al. further note that while WHO and other international organizations have focused efforts to reduce maternal mortalities on the availability of skilled birth attendance, they have done so without involvement of TBAs who are believed to offer birthing services at home.¹⁸ The study recommended that as countries move towards utilization of skilled birth attendance and care, policy makers need to make the best use of TBAs as they plan for their replacement with skilled birth attendants.

Garces et al. also suggest that TBAs could still be allowed to accompany expectant mothers to health care institutions for delivery, which a role is included as part of the activities carried out by TBAs in the intervention site of the current study. The findings of the current study, along with the previous works cited above, confirm the positive role TBAs play in increasing referrals of mothers for skilled birth care. They suggest that TBAs play an important role in maternity in rural and remote areas of low and middle-income countries to improve

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maternal and child health. However, findings of the current study were inconsistent with those of a study in Western Kenya, which reported out-dated practices among TBAs with regard to maternal and child health services, although they had high rates of referrals of mothers with obstetric complications.¹⁹ Similarly, Gitonga et al. examined efforts aimed at improving skilled birthing, focusing on the determinants and role of maternal and neonatal health intervention programmes in Migori County.²⁰ The findings revealed the programme improved skilled birth attendance, but having contact with TBAs reduced the likelihood of SBC, which was inconsistent with the findings of the current study. The other reason for the reduced likelihood of uptake of skilled birth care in the Migori study could be due to the fact that TBAs were not trained on the significance of SBC services. In the current study, however, TBAs were inducted on the benefits of SBC services.

The services of traditional birth attendants, though temporarily indispensable, are regarded as merely stopgap measures until they could be replaced by professionals.²¹ They add that the WHO, UNICEF and UNFPA neither value nor perceive traditional birth attendants' skills necessary. Graham and Davis-Floyd further aver that these health-related organizations' attitude suggests a lack of understanding of the holism of TBAs' roles as culturally and socially specific to their contexts. They also contend that such devaluation of traditional birth attendants has led to loss of their own self confidence and loss of confidence by those who used to value and utilize their services. These scholars propose the need for a model of collaboration to be developed in conjunction with TBAs and the conventional medical staff, in what they call a "partnership paradigm", characterised by mutual respect and accommodation between the formally opposed formal medical practitioners and traditional birth attendants. The current study concurs with the above assertion that TBAs are not fully understood or recognized. Current study findings also support the need for partnership between the conventional medical practitioners and the TBAs in their respective communities.

Limitations

The study was not without limitations. Being a community-based study, it was impossible to control individuals' movements from and to the two study sites, this included movements of traditional birth attendants. This could have brought about contamination or some effect of the practice of maternal and child health practices especially in the control site. However, this possibility was overcome by the distance between the intervention site (Pokot South sub-County) and control site (Pokot North sub-County). This was further enhanced by the location of West Pokot sub-County (another sub-County) in-between the two study sites. Presence of another sub-County separating the two study sites made leakage of the intervention to the control site difficult.

CONCLUSION

A higher proportion of mothers utilized SBC by having childbirth in the health facility in the intervention site (Pokot South Sub-County). Therefore, TBAs-led intervention increased utilization of skilled birth care among mothers in the intervention group compared to mothers in the control arm (Pokot North Sub-County) who utilized standard care. In addition to SBC, majority of the mothers in the intervention arm had a birth plan compared to those in the control arm of the study. Further, poor terrain, long distance to health care facility, and lack of finances are major obstacles to SBC utilization in West Pokot County.

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