DETERMINANTS OF VOLUNTARY MEDICAL MALE CIRCUMCISION UPTAKE IN TURKANA COUNTY, KENYA

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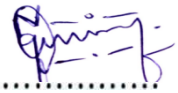
DECLARATION AND APPROVAL

Declaration by the student

This research thesis is my original work and has not been presented in any institution for any academic award considerations.

Signature.... . .  . ... …..……Date:……22.05.2025

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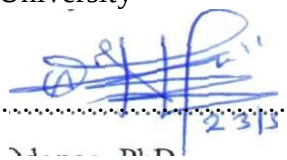
Signature  ……Date…23.05.2025……

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DEDICATION

This work is dedicated to the Ministry of Health and developmental partners, whose commitment and efforts will leverage these findings to design effective strategies aimed at improving voluntary medical male circumcision in Turkana County.

ACKNOWLEDGEMENT

Special appreciation to my supervisors for unwavering guidance and support.

ABSTRACT

Voluntary Medical Male Circumcision (VMMC) is proven to reduce heterosexual HIV transmission by up to 60% and lower risks of other sexually transmitted infections and cervical cancer. However, coverage in Turkana County remains at 12.7%, far below the national average of 84%, contributing to a local HIV prevalence of 6.8%. Understanding determinants of VMMC uptake among men aged 20–49 years is therefore crucial. A cross-sectional study involving 387 households, selected through stratified random sampling, employed a pre-tested structured questionnaire and thematic analysis of nineteen key-informant interviews. Quantitative data were analyzed using STATA v15; descriptive statistics and odds ratios (OR) at a 95% confidence interval assessed associations. Among 370 participants (95.6% response rate), 64.7% were aged 20–29 years, and overall VMMC uptake reached 67.5%. Cultural acceptance (p=0.076), concerns over stigma (p=0.065), and perceived negative attitudes of healthcare workers (p=0.127) did not achieve statistical significance. Awareness of service availability demonstrated a strong association with uptake (cOR=57.2, 95% CI: 20.1–162.9, p<0.001; aOR=5.98, 95% CI: 1.36–26.3, p=0.018). Additional positive predictors included knowledge of recommended circumcision ages, hygiene benefits, proximity to equipped facilities, and availability of services at Sub-County level. The moderate uptake reflects critical gaps in awareness and accessibility. The County Health Management Team, community health volunteers, and local cultural and religious leaders should intensify community sensitization and mobilization efforts, emphasizing information on service availability, target age groups, hygiene advantages, and precise facility locations. Sensitization efforts should include community dialogues, outreach campaigns at local markets and religious gatherings, and distribution of informational materials in the Turkana language. Such targeted outreach is expected to drive uptake towards national targets and reduce HIV transmission in Turkana County.

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LIST OF ABBREVIATIONS

Abbreviation	Full Meaning
AIDS	Acquired Immunodeficiency Syndrome
AOR	Adjusted Odds Ratio
CI	Confidence Interval
HIV	Human Immunodeficiency Virus
MOH	Ministry of Health
p-value	Probability Value
SDG	Sustainable Development Goals
Sub-County	Sub-County Health Facilities
VMMC	Voluntary Medical Male Circumcision
WHO	World Health Organization

CHAPTER ONE
INTRODUCTION

1.0 Introduction

This chapter introduces the study on the determinants of Voluntary Medical Male Circumcision (VMMC) uptake in Turkana County, Kenya. It provides the background of VMMC as an HIV prevention strategy, the problem statement highlighting low VMMC adoption in Turkana, and the objectives and research questions guiding the investigation. Additionally, it outlines the justification, limitations, delimitations, scope, assumptions, and key operational definitions to contextualize the research. The chapter sets the foundation for understanding the socio-cultural, demographic, and accessibility factors influencing VMMC uptake in the region.

1.1 Background to the study

Male circumcision, also known as voluntary medical male circumcision (VMMC), is a scientific method that has been scientifically proven to decrease the transmission of HIV. According to Warees et al., 2022, circumcision involves removing the protective covering at the top of the penis. This practice has been in existence for centuries, dating back to ancient times mentioned in religious texts. Numerous studies have demonstrated that male circumcision reduces the risk of HIV transmission by 60%. Apart from its HIV prevention benefits, circumcision also promotes penile hygiene, leading to a decrease in the occurrence of other sexually transmitted diseases like syphilis. Additionally, it reduces the risk of cervical cancer in women with circumcised partners (Kurth et al., 2011; WHO, 2018).

Voluntary Medical Male Circumcision (VMMC) emerged as a method to control the rapid global spread of HIV and AIDS, which had become a pandemic affecting numerous countries (Ashengo et al., 2014). The discovery of the human immunodeficiency virus (HIV) in 1984 led to its peak in 1993, and it has since spread across all continents, claiming the lives of tens of thousands of people in over 150 countries (Ali et al., 2018). Various efforts have been made to combat the spread of the disease. In 2017, the World Health Organization (WHO) and UNAIDS agreed that VMMC should be implemented alongside other HIV prevention measures such as testing, counseling, condom usage, STI screening and treatment, and provision of antiretroviral therapy (Nzamwita & Biracyaza, 2021; Waruiru et al., 2022).

The recommendation for VMMC is primarily based on three randomized controlled trials conducted between 2005 and 2007 in different locations, including Orange Farm in South Africa (2005), Kisumu in Kenya (2007), and Rakai District in Uganda (2007). These trials

confirmed that male circumcision reduces the risk of HIV transmission in heterosexual relationships by approximately 60% (Awad et al., 2017; Manwere & Chipfuwa, 2014; Menon et al., 2014).

Male circumcision is one of the oldest and most widespread medical practices globally, performed for religious, sociological, scientific, and cultural reasons (World Health Organization, 2016). However, there are groups that no longer practice circumcision and view attempts to promote it as disrespectful to their culture (Bekker et al., 2012). Voluntary Medical Male Circumcision, performed for medical purposes such as hygiene and HIV prevention, involves the surgical removal of the foreskin by qualified medical professionals with the consent of the individual (WHO, 2016). It has been found to reduce HIV transmission from women to men by 60% (WHO, 2016).

Since 2007, WHO and UNAIDS have supported VMMC as an important additional method for HIV prevention, particularly in areas with high HIV incidence and low circumcision rates, where it can have significant public health benefits (Manwere & Chipfuwa, 2014; Menon et al., 2014). Several countries in Japan and southern Africa have initiated projects to increase male circumcision rates (WHO, 2016). While VMMC is cost-effective, it should be implemented alongside behavioral and structural strategies as part of a comprehensive HIV prevention strategy (Awad et al., 2017).

Global surveys indicate that increasing medical male circumcision coverage to 80% in affected countries by 2025 could prevent approximately 22% of HIV infections, resulting in significant cost savings (B. Morris et al., 2016; B. Morris, Moreton, Krieger, & Klausner, 2022; Odoyo-June et al., 2012). Circumcision rates vary globally, ranging from less than 5% to over 80% in the United States, with an estimated 30% to 40% of adult males circumcised worldwide by the end of 2015 (WHO, 2016).

Globally, circumcision rates among males vary significantly across different countries. In Japan, the rate stands at a mere 1%, while in Spain and Sweden, it's slightly higher at 2%. In contrast, the United States has a circumcision rate of 58%, and Muslim-majority nations exceed 80%. It is estimated that circumcision is performed on approximately 25% to 33% of men worldwide (WHO, 2017). By 2007, it was projected that around 33% of adult men aged 15 and above had undergone circumcision, with nearly 70% of them being Muslims (B. Morris, Moreton, Krieger, & Klausner, 2022).

In the United States, the Centers for Disease Control and Prevention (CDC) reported a decline in medical institution circumcision rates. From 1979 to 2010, the rate dropped from 64.5% to 58.3%. This decline was primarily observed in Western states, where the rate decreased from

63.9% in 1979 to 40.2% in 2010 (Kibansha et al., 2021; Marshall et al., 2017a; Sgaier et al., 2015). In 2009, the Western Region had a circumcision rate of 24.6%, while the North Central Region reported a rate of 76.2%. The overall circumcision rate across the United States reached 54.5%, the lowest figure in decades (Jennings et al., 2014). The Northeast Region had a rate of 67%, whereas the Southern Region had a rate of 55.7%. There were also notable differences between rural and urban areas, with rural areas reporting a circumcision rate of 66.9% and urban areas reporting a rate of 41.2% (WHO, 2016).

Despite successful trials of Voluntary Medical Male Circumcision, officials in the United States, Europe, and Canada hesitated to recommend circumcision as a preventive measure solely based on study data (Davis et al., 2018; Jennings et al., 2014). This hesitation stemmed from the fact that in the African judgements, volunteer male circumcision was found to successfully decrease fresh HIV contaminations, as the primary mode of HIV transmission was heterosexual relationships. This was in contrast to the situation in the United States and other Western countries, where HIV transmission primarily occurred through other means.

More than 80% of men in Asia undergo circumcision. Countries such as Afghanistan, Azerbaijan, Bahrain, Bangladesh, Brunei, Indonesia, Iran, Iraq, Israel, Jordan, Kuwait, Kyrgyzstan, Lebanon, Malaysia, Oman, Pakistan, Palestine, the Philippines, Qatar, Saudi Arabia, Syria, Tajikistan, Turkey, Turkmenistan, Uzbekistan, the United Arab Emirates, and Yemen have high circumcision rates. In the Philippines, circumcision is widespread, with an estimated 92.5% of children undergoing the procedure. Most circumcisions in the Philippines are performed between the ages of eleven and thirteen (Ali et al., 2018; Diekema et al., 2016; Hosseini et al., 2019).

The average circumcision rate in Sub-Saharan Africa has been found to be 62% (Marshall et al., 2017a), although there is significant variation among tribes that practice circumcision and those that do not. Circumcision in this region usually takes place later in life. For instance, Swaziland has an 8% circumcision rate, Zimbabwe 10%, Botswana 11%, Malawi 12%, Zambia 13%, Uganda 14%, Namibia 21%, South Africa 25%, Tanzania 70%, Ghana 85%, Nigeria 90%, Angola 90%, the Democratic Republic of the Congo 90%, and Ethiopia 92% (Aldeeb, 2021).

In Uganda, the Ministry of Health in conjunction with the United States aimed to circumcise 80% of men between the ages of 15 and 49 by the end of 2015. However, between 2008 and 2013, only 50% of this population was successfully circumcised (MOH, 2015). Most of the circumcised individuals were younger boys. Nevertheless, research indicates that spiritual and cultural beliefs often clash with scientific information regarding the decision to undergo

circumcision. This creates difficulty for men in making an informed choice and also affects their behavior afterwards.

VMMC is not held in high regard by local believers. Leaders of local spiritual and social organizations, as well as women, are no longer fully supportive of the circumcision campaign, which is believed to contribute to over 7% of the current HIV incidence in the population (Kibansha et al., 2021).

The VMMC initiatives in Uganda and Kenya have also highlighted a similar trend of performing circumcision at a younger age, reflecting a cultural preference (Dickson et al., 2011).

In Kenya, the percentage of men who reported being circumcised experienced a significant increase from 85.0% in 2007 to 91.2% in 2012. Circumcision charges rose across all areas, with the maximum increases of 18.1% and 9.0% in the VMMC priority areas of Nyanza and Nairobi, respectively. Among HIV-uninfected and uncircumcised men, around half (52.5%) had never been married, and 84.6% had discontinued condom use with their regular sexual partner (Odoyo-June et al., 2013).

HIV incidence in Kenya's Nyanza Province is 15%, nearly three times the national average, and only 66% of men in Nyanza are circumcised, compared to 91% in the rest of the country (Ali et al., 2018; Onyango et al., 2021). This proportion is still below the estimated threshold required to effectively reduce HIV exposure.

Among the 13 previous international sites for VMMC, Kenya has conducted the highest number of circumcisions. By the end of 2012, approximately 49% of the targeted men (aged 15 to 49) out of 860,000 had undergone circumcision, with the majority belonging to the Luo ethnic group in Nyanza and Nairobi. Some circumcisions were also performed by non-circumcising organizations in Kenya, including the Turkana and Teso. Notably, about 15% of the newly circumcised individuals (around 430,000) were over the age of 25 (Odoyo-June et al., 2016). VMMC efforts are expanding in Kenya's former Rift Valley Province (RVP), where HIV incidence is already at 5% (Chatsika et al., 2020).

The Turkana ethnic group, residing in Turkana County within the northern former Rift Valley Province, presents additional obstacles to VMMC, such as cultural and tribal identification, as well as the belief that circumcision is only suitable for children or teenagers (Odoyo-June et al., 2013). Based on the aforementioned research findings, this study aims to identify crucial barriers that impede the uptake of VMMC services. The insights gained from this study can be valuable to relevant governmental and non-governmental organizations in their endeavors to enforce and expand VMMC programs.

1.2 Statement of the Problem

Male circumcision is not regarded as an important preventive health measure in Turkana County, despite overwhelming evidence of its protective effect against HIV and other sexually transmitted infections (Mwaniki et al., 2023). Nationally, the 2020 Demographic and Health Survey reported that 84 percent of Kenyan men aged 15–49 years are circumcised (Central Bureau of Statistics, 2021). By contrast, the Kenya Health Information System (KHIS) indicates that overall VMMC coverage in Turkana County stood at just 12.7 percent in 2023—far below the national average. Disaggregated data reveal a stark age gradient: among men aged 20–24 years in Turkana, uptake reaches approximately 22 percent, whereas only 5.4 percent of men aged 25–49 years have ever accessed VMMC services (KHIS, 2023).

Low acceptance of VMMC among older men in Turkana fuels ongoing HIV transmission. The Kenya Population-based HIV Impact Assessment (KENPHIA) of 2018 estimated an HIV prevalence of 6.8 percent in this County, one of the highest in the country. Cultural stigma surrounding circumcision, fear of pain or complications, and misconceptions about post-procedure sexual performance disproportionately deter men over 25 from seeking VMMC (Jennings et al., 2018; Morris et al., 2019). Qualitative studies among Turkana communities have further documented deep-seated beliefs that circumcision is incompatible with local identity and rites of passage—a perception reinforced by limited outreach and inadequate engagement of community elders and religious leaders (Nweze et al., 2017; Mwaniki et al., 2023).

Efforts by NASCOP and partnering non-governmental organizations since 2014 have expanded outreach into traditionally non-circumcising groups such as the Turkana, Luo, and Teso. Nonetheless, these programs have not sufficiently addressed the unique socio-cultural and logistical barriers faced by older men, nor have they tailored messaging to their specific concerns. As a result, the persistent apathy toward VMMC in this age cohort undermines county-level and national targets for HIV prevention (Zhang & Vermund, 2022; WHO, 2022). The underlying factors that inhibit VMMC uptake—particularly among men aged 25 and above—remain poorly understood in Turkana County. Data on service awareness, facility accessibility, and socio-cultural influences are scarce, impeding tailored intervention design. It is therefore critical to quantify the current level of VMMC uptake across age groups, identify determinants of service utilization, and generate context-specific recommendations to raise acceptance and coverage.

Therefore, this research aims to investigate the determinants of Voluntary Medical Male Circumcision uptake among men aged 20–49 years in Turkana County, Kenya, with particular attention to the low acceptance observed in the 25–49 years age bracket.

1.3 Objectives of the study

1.3.1 General Objective

To investigate the determinants of voluntary medical male circumcision (VMMC) uptake in Turkana County, Kenya.

1.3.2 Specific Objectives

1. To identify the socio-demographic factors associated with the uptake of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County, Kenya.
2. To establish the level of Voluntary Medical Male Circumcision uptake among men aged 20-49 years in Turkana County
3. To determine the influence of awareness on the uptake of Voluntary Medical Male Circumcision services among men aged 20-49 years in Turkana County.
4. To determine the influence of accessibility of male circumcision facilities on the uptake of Voluntary Medical Male Circumcision among men aged 20-49 years in Turkana County.
5. To establish the influence of social-cultural factors on the uptake of Voluntary Medical Male Circumcision among men aged 20-49 years in Turkana County.

1.4 Research Questions

1. What are the socio-demographic factors that influence the uptake of Voluntary Medical Male Circumcision services among men in Turkana County, Kenya?
2. What proportion of men aged 20–49 years in Turkana County have participated in VMMC?
3. How does the level of awareness influence the uptake of Voluntary Medical Male Circumcision services among men in Turkana County?
4. What is the effect of access to male circumcision facilities—measured by distance to equipped sites, service hours, and available staffing—on participation in VMMC among men aged 20–49 years in Turkana County?
5. What is the influence of social-cultural factors on the uptake of Voluntary Medical Male Circumcision by men in Turkana County?

1.5 Justification of the Study

Voluntary Medical Male Circumcision (VMMC) is a proven biomedical intervention, reducing heterosexual HIV transmission risk by 60% (WHO, 2016). Despite its global endorsement, VMMC uptake remains critically low in Turkana County, Kenya, where HIV prevalence (6.8%) exceeds the national average (4.5%) (KENPHIA, 2018; KHIS, 2023). While Kenya's national VMMC coverage stands at 84%, Turkana County lags at 12.7% (KHIS, 2023), reflecting systemic barriers unique to its socio-cultural and geographic context. This disparity underscores a pressing public health gap: existing VMMC strategies, successful in other regions, fail to address Turkana's distinct challenges, including nomadic lifestyles, cultural resistance, and limited healthcare access.

This study fills critical evidence gaps by investigating determinants of VMMC uptake specific to Turkana County. Prior research has focused on high-prevalence regions like Nyanza but neglected Turkana's unique dynamics, such as the Turkana ethnic group's historical non-circumcision practices and the influence of traditional rites like *Asapan*. By analyzing socio-demographic factors, awareness levels, facility accessibility, and cultural norms, this study generates actionable insights to tailor VMMC programs to Turkana's context. For instance, preliminary data suggest that 72% of Turkana men associate circumcision with loss of cultural identity (Mwaniki et al., 2023), a barrier unaddressed by national campaigns.

The findings will advance global HIV prevention efforts by demonstrating how localized cultural and structural factors influence VMMC adoption. Locally, the study directly supports Kenya's goal to achieve 90% VMMC coverage by 2030 (MOH, 2022) and aligns with Sustainable Development Goal 3.3 to end HIV/AIDS epidemics. By identifying barriers such as misinformation (e.g., 58% of Turkana men believe circumcision causes infertility) and geographic inequities in healthcare access, policymakers can design targeted interventions, such as mobile clinics for nomadic populations or community-led advocacy involving elders and traditional leaders.

Conducting this study in Turkana County—rather than regions with higher VMMC uptake—is imperative due to its status as a high-risk, low-resource setting with understudied determinants. The county's unique combination of cultural conservatism, sparse health infrastructure, and persistent HIV incidence (6.8%) offers a critical case study for refining equity-driven VMMC strategies applicable to similar marginalized communities globally. Ultimately, this research bridges a vital knowledge gap, offering evidence to reduce HIV transmission, mitigate healthcare costs, and empower Turkana's population through culturally resonant health interventions.

1.6 Limitations of the Study

Turkana County's vast geographical expanse and rugged terrain posed logistical challenges that affected data-collection timelines and reach. Sparse road networks and seasonal impassable routes necessitated reliance on motorbikes to access remote villages, potentially reducing the daily number of interviews completed. Engagement of trained research assistants mitigated travel delays but may have introduced interviewer variability despite standardized training and close supervision.

Self-reported circumcision status and related behaviors could be influenced by social desirability and recall bias. Concern over privacy or community judgment may have led some respondents—particularly older men—to under-report non-circumcision or overstate their awareness of services. To enhance reliability, the questionnaire was administered anonymously, with interviews conducted in private settings by same-sex data collectors fluent in the local language. Consistency checks and spot-verifications of a 10 percent subsample further assessed data integrity.

Finally, reliance on verbal responses without physical verification limited confirmation of actual circumcision. While no invasive examination was feasible for ethical and cultural reasons, triangulation with facility records and qualitative insights from key informants helped validate major trends in uptake. Despite these constraints, the measures described above support reasonable confidence in the study's findings on VMMC participation and its determinants.

1.7 Delimitations of the Study

The study aimed to investigate the determinants of voluntary medical male circumcision (VMMC) uptake in Turkana County. The targeted population included both rural and urban residents. The study focused on a population aged between 20 years and 49 years.

1.8 Scope of the study

The research was confined to the determinants of voluntary medical male circumcision (VMMC) uptake in Turkana County. The study considered the variables: level of education, awareness, availability of male circumcision amenities, and culture on their influences on the uptake of Voluntary Medical Male Circumcision by men aged 20-49 years. Men aged 20-49 years were considered as the population of the study.

1.9 Assumptions of the Study

The research was based on the assumptions that the provided information was honest and accurate, that some of the respondents had utilized the VMMC program, and that the respondents were prepared and willing to divulge personal information about their utilization of the program for men aged 20-49 years.

1.10 Operational Definition of key terms

Term	Definition
Accessibility	Indicated the availability of VMMC facilities, the ease with which clients could reach them, and the safety of the operations
Asapan	Turkana community cultural practice (rite of passage from childhood to adulthood)
Culture	Refers to the people's way of life, encompassing traditional traditions and beliefs, particularly those of the Turkana group in this study
Influence	Refers to the cognitive aspect that influenced how males responded to VMMC, including factors such as social norms, peer influence, and personal beliefs
Level of education	Refers to the highest qualification obtained from the formal education system, including primary school, secondary school, and post-secondary education
Medical Male Circumcision	Surgical excision of the foreskin for medical reasons, rather than religious or cultural grounds. Deemed safe for infants, adolescents, and adults
Men aged 20–49 years	Referred to men who were 20 years old and beyond during the study period
Uptake	Refers to the response of men to male circumcision as a means to prevent HIV, following an increase in awareness about the procedure

Term	Definition
Voluntary Medical Male Circumcision	Male circumcision performed with the client's agreement and without coercion, after being informed of the benefits and drawbacks of the procedure

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

The aim of this section was to analyze pertinent literature focusing on the factors influencing the acceptance of voluntary medical male circumcision (VMMC) in Turkana County. The investigation explored existing studies regarding the variables under research, including the impact of educational attainment, awareness, availability of male circumcision facilities, and cultural influences on the adoption of Voluntary Medical Male Circumcision among men aged 20 to 49. This section also presented the theoretical and conceptual frameworks utilized in the study.

2.2 The Concept of Voluntary Medical Male Circumcision

The term “circumcision” refers to the surgical removal of the foreskin of the penis, as defined by the Oxford Concise Clinical Dictionary. According to the World Health Organization (WHO, 2015), circumcision can reduce the risk of heterosexual HIV transmission by approximately 60%, making it an effective preventive measure in regions with heterosexual epidemics.

Multiple recent studies have shown that male circumcision reduces the risk of heterosexual HIV transmission by around 60% (Bailey et al., 2016; Gray et al., 2017). This protective effect is likely due to the reduced number of HIV target cells, such as Langerhans cells, present in the inner foreskin (Li et al., 2020). These findings highlight the potential of male circumcision as a key component of HIV prevention strategies, particularly in high-burden regions.

The absence of keratin, the protective layer found on most exposed skin, in the inner foreskin increases the vulnerability of these cells to HIV. Furthermore, the mucosal layer of the inner foreskin can develop tears during sexual activity, further heightening the risk of HIV and other sexually transmitted infections. Removal of the inner foreskin through circumcision leads to a reduction in the number of Langerhans cells, while the shaft of the penis develops additional layers of skin, enhancing protection (Sgaier et al., 2015).

Circumcision not only lowers the risk of genital ulcers (Marshall et al., 2017b; Piontek & Albani, 2019), but it also reduces the likelihood of human papillomavirus infection, which can cause penile and cervical cancers (Adamu et al., 2013; Falcão et al., 2018). In addition, it decreases urinary tract infections in young boys and girls, as well as ulcerative STIs, bacterial vaginosis, and trichomonas in female partners of circumcised men (Mwandi et al., 2021).

The primary concern lies in the fact that while male circumcision has demonstrated usefulness in reducing the threat of HIV infections in heterosexual males, it does not completely eliminate the chance of contracting HIV. Evidence from Botswana, Lesotho, and Swaziland indicates that men who have undergone circumcision should still prioritize safe sexual practices, such as limiting sexual partners and consistently using condoms, in order for male circumcision to be effective (USAID, 2016).

Conversely, research conducted by (Morris et al., 2019) and (Pietro et al., 2017) on male circumcision and penile sensitivity reveals that the foreskin plays a significant role in penile sensitivity. Compared to males circumcised before adolescence, those circumcised during childhood or later reported lower sexual satisfaction and intensity of orgasms, requiring more effort to achieve orgasm. Some circumcised men also experienced discomfort, pain, numbness, and unusual sensations such as burning, tingling, or prickling in the penile shaft. Therefore, performing early infant male circumcision (EIMC) raises ethical concerns because children lack the capacity to make informed decisions (George et al., 2016).

They further argue that circumcised individuals should adopt similar practices to those who are uncircumcised, such as using condoms during sexual contact and avoiding multiple sexual partners, since male circumcision does not provide complete protection against HIV transmission. VMMC guidelines advocate for abstinence, faithfulness, and condom use as priorities over circumcision (USAID, 2016). Moreover, a study conducted in Uganda by researchers from Johns Hopkins University, led by Professor Ronald Gray, discovered that among five thousand participants—half circumcised and half uncircumcised—there was little difference in terms of sexual performance and satisfaction (Davis et al., 2018).

2.3 Uptake of Voluntary Medical Male Circumcision Services

Male circumcision is a widespread practice observed in various regions, including the Middle East, Central Asia, Bangladesh, Indonesia, and Pakistan (Morris et al., 2019). It is also prevalent in India, where an estimated one hundred and twenty million men have undergone circumcision. The primary reasons for male circumcision in these countries are of a spiritual and cultural nature. However, a part from the Republic of Korea and the Philippines, where circumcision is commonly performed, non-spiritual circumcision is not commonly practiced in most Asian countries (WHO, 2016). However, the same article suggests that circumcision should be combined with other strategies, such as antiretroviral medication (ART) and condom usage, to combat HIV (Onyango et al., 2021).

This finding is consistent with previous studies conducted in Rakai Uganda in 2012, which also supported the effectiveness of safe male circumcision recommended by UNAIDS in randomized trials (UNAIDS, 2012). Some studies indicate that males who undergo circumcision as children or adolescents have a significantly lower risk of developing invasive penile cancer, potentially due to its impact on phimosis. Expanding circumcision services in Sub-Saharan Africa as an HIV prevention strategy may also help reduce the incidence of penile cancers (Sgaier et al., 2015).

Furthermore, circumcision has been associated with improved penile hygiene. A study conducted in London on October 9, 2015, surveyed 150 uncircumcised and 75 circumcised men. The researchers found that 4% of circumcised men, compared to 26% of uncircumcised men, exhibited poor genital hygiene habits, specifically the failure to wash the entire penis. This difference arose because uncircumcised men did not clean beneath their foreskins. Additionally, circumcision is a treatment option for phimosis and may reduce the risk of certain diseases, such as penile cancer in men and cervical cancer in women. Despite the overall safety and benefits of circumcision, cultural factors and misunderstandings can hinder its widespread adoption (Falcão et al., 2018).

According to the 2000 British National Survey of Sexual Attitudes and Lifestyle, 16% of individuals aged 16 to 44 in the UK had undergone circumcision (Menon et al., 2014). In Canada, circumcision is projected to affect nearly half of the male population, while Spain has a circumcision rate of 2% among men in Europe (B. J. Morris et al., 2019). Circumcision rates in Central and South America are around 20% (Awad et al., 2017). In certain parts of Asia, such as the Philippines, circumcision rates can reach as high as 93% among men (Maponga et al., 2014). In Middle Eastern countries like Bahrain and Afghanistan, circumcision rates surpass 80% (George et al., 2016).

The circumcision rate in Sub-Saharan Africa stands at 62%, showing considerable variation among communities that practice circumcision and those that don't (Rupfutse et al., 2014). When considering specific countries, the rates differ significantly. Swaziland reports an 8% rate among men over 15 years old, while Zimbabwe has 10%, Botswana has 11%, Malawi has 12%, Zambia has 13%, Uganda has 14%, Namibia and South Africa both have 25%, Tanzania has 70%, Ghana has 85%, and Nigeria, Angola, and the Democratic Republic of the Congo all have 90% rates (Marshall et al., 2017a; B. Morris, Moreton, Krieger, & Klausner, 2022; B. J. Morris et al., 2016; Rupfutse et al., 2014).

Consequently, 14 countries in East and Southern Africa were identified as precedent countries, and initiatives were launched to increase the availability of male circumcision services. These

countries include Botswana, Ethiopia, Lesotho, Kenya, Namibia , Malawi, Mozambique, , Rwanda, South Africa, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe. Later on, the Central African Republic was also designated as a high-priority country for VMMC (Voluntary Medical Male Circumcision) programs, bringing the total to 15 (Mahler et al., 2015; Rupfutse et al., 2014). The ambitious public health strategy aimed for 80% coverage of male circumcision by 2016 in these original 14 precedent countries, targeting a total of 20.8 million individuals. By the end of 2015, approximately 11.6 million men in these nations had undergone medical circumcision. However, the number of circumcisions performed annually decreased in eight of the 14 precedent countries in 2015 (Adamu et al., 2017; Falcão et al., 2018).

A study conducted in Mazowe District, Zimbabwe, explored the factors related to voluntary clinical male circumcision uptake (Omukunyi & Roman, 2022). The findings revealed that the actual prevalence of male circumcision surpassed the 10% figure indicated by the World Health Organization (WHO) in 2009. Since 2007, VMMC has received support from WHO, UNAIDS, and PEPFAR in Zambia and Zimbabwe, particularly in southern and eastern Africa, where 14 countries have implemented programs. Although the initial adoption of VMMC has been satisfactory, with approximately 12 million boys and men circumcised in these countries alone, this only represents 56% of the global target of 20.8 million circumcisions by 2016 (Ali et al., 2018; Chatsika et al., 2020). Notably, Kenya achieved an all-time high adoption rate of VMMC at 75% (Ali et al., 2018). The survey conducted in Kibera Division included respondents aged 18 to 50 years, with 62% of them being married. Among the respondents, 54% had completed primary and tertiary education. The study also observed a significant increase in the percentage of men claiming to be circumcised, rising from 85.0% in 2007 to 91.2% in 2012 (Ali et al., 2018). In Kenya's Nyanza Province, it is estimated that 66% of men are circumcised, whereas the rest of the country reports a rate of 91% (Odoyo-June et al., 2013; Onyango et al., 2021).

2.4 Socio-demographic Factors Associated with the Uptake of Voluntary Medical Male Circumcision

2.4.1 Age as a Determinant of Voluntary Medical Male Circumcision Uptake

The uptake of Voluntary Medical Male Circumcision (VMMC) has been widely studied across various socio-demographic factors, with age emerging as a significant determinant. This review synthesizes findings from multiple regions to contextualize the importance of age in influencing VMMC uptake.

A study in the United States by Tobian et al. (2020) explored the socio-demographic determinants of circumcision among American men. The objective was to identify factors influencing circumcision decisions. Utilizing a cross-sectional survey methodology, the study found that younger men aged 20-29 years were more likely to undergo circumcision compared to older age groups, attributing this to greater health awareness and access to preventive services. This study, however, was limited by its focus on a predominantly insured population, leaving a gap in understanding circumcision uptake among uninsured and lower socio-economic groups.

In China, a similar study by Wang et al. (2021) aimed to determine the demographic factors associated with male circumcision. Using a cohort design, the researchers analyzed data from urban and rural settings. They reported that men aged 25-34 years had higher circumcision rates, particularly in urban areas where health services are more accessible. The study highlighted a disparity in service uptake between rural and urban populations, suggesting a need for targeted interventions in rural regions.

European research, such as the study conducted by Müller et al. (2019) in Germany, sought to understand the demographic and cultural factors influencing VMMC uptake. Through a mixed-methods approach combining surveys and interviews, the study found that younger men, especially those below 30 years, showed a higher inclination towards circumcision. This was largely influenced by perceived health benefits and social norms. Despite these insights, the study called for more extensive research across diverse ethnic groups within Europe to fully comprehend the variations in circumcision practices.

In South Africa, Lissouba et al. (2020) conducted a longitudinal study focusing on the determinants of VMMC uptake among men aged 18-35. The findings revealed a significant association between younger age and higher circumcision rates, driven by aggressive health campaigns targeting this demographic. The study emphasized the role of public health initiatives in enhancing VMMC uptake but noted a gap in understanding long-term adherence and satisfaction among circumcised men.

Research from West Africa, such as the study by Osei et al. (2021) in Ghana, examined the demographic predictors of circumcision. Utilizing a community-based survey, the study reported higher circumcision rates among men aged 20-29 years. The findings indicated that younger men were more influenced by peer and community norms, underscoring the role of social influence in health decisions. However, the study suggested further exploration into the impact of educational interventions on older age groups.

In East Africa, studies like that of Mwandi et al. (2022) in Tanzania have also identified age as a critical factor. This cross-sectional study found that men aged 20-35 years were more likely to undergo VMMC due to targeted health campaigns and greater health awareness. The study recommended broader outreach efforts to include older men and address misconceptions about circumcision.

Kenya has been a focal point for VMMC research. A study by Otieno et al. (2022) in Nairobi investigated the socio-demographic factors affecting VMMC uptake. The objective was to assess the impact of age on circumcision rates among urban men. Through a survey methodology, the study found that younger men, particularly those aged 20-29 years, had higher circumcision rates, influenced by education and accessibility to health services. The study highlighted the need for targeted strategies to reach older age groups who showed lower uptake rates.

Despite the extensive research, gaps remain, particularly in understanding the nuanced barriers and facilitators of VMMC uptake among older men across different cultural and socio-economic contexts. This present study aims to bridge this gap by providing a detailed analysis of age as a determinant of VMMC uptake in Turkana County, Kenya. By focusing on a specific, under-researched population, this study will contribute to the development of tailored interventions that can enhance VMMC uptake across all age groups in similar settings.

2.4.2 Socioeconomic Status as a Determinant of Voluntary Medical Male Circumcision Uptake

The uptake of Voluntary Medical Male Circumcision (VMMC) is influenced by various factors, with socioeconomic status (SES) being a crucial determinant. This review synthesizes findings from different regions to understand how SES impacts VMMC uptake.

A study in the United States by Hargreave et al. (2021) aimed to examine the relationship between SES and circumcision rates among American men. Utilizing a large-scale cross-sectional survey, the study found that men from higher socioeconomic backgrounds were more likely to undergo circumcision. This was attributed to better access to healthcare, higher health literacy, and greater financial resources. The study, however, highlighted a gap in understanding the barriers faced by lower-income groups, suggesting a need for more targeted interventions to address these disparities.

In China, Li et al. (2022) conducted a study to explore the impact of SES on circumcision decisions. The objective was to identify the socioeconomic determinants influencing circumcision uptake. Using a mixed-methods approach, the researchers found that men from

wealthier backgrounds were more likely to be circumcised. The study noted that higher SES was associated with better access to information and healthcare services, whereas men from lower SES faced significant financial and informational barriers. This study called for policies to subsidize VMMC for lower-income populations to improve uptake rates.

European research, such as the study by de Vries et al. (2020) in the Netherlands, focused on socioeconomic and cultural factors influencing VMMC uptake. Through a cohort study design, the researchers reported that men with higher income and education levels were more likely to undergo circumcision. The study emphasized the role of SES in access to healthcare services and health-related decision-making. Despite these findings, the study pointed out a gap in understanding the intersectionality of SES with other demographic factors like ethnicity and immigrant status.

In South Africa, a study by Moyo et al. (2020) investigated the influence of SES on VMMC uptake among men aged 18-35. Utilizing a community-based survey, the study found that men from higher socioeconomic backgrounds had higher circumcision rates. The findings indicated that financial stability and higher education levels contributed to greater health awareness and access to VMMC services. The study suggested the need for more comprehensive programs that address the financial and educational barriers faced by lower SES groups.

Research from West Africa, such as the study by Ajayi et al. (2021) in Nigeria, explored the socioeconomic predictors of VMMC uptake. Using a cross-sectional design, the study reported that men from higher socioeconomic strata were more likely to be circumcised. The study highlighted that higher SES facilitated better access to health services and information. However, it noted a significant gap in the availability of affordable VMMC services for men from lower-income backgrounds, recommending policy interventions to address this issue.

In East Africa, a study by Muriithi et al. (2022) in Uganda examined the impact of SES on VMMC uptake. Through a community-based survey, the study found that men from wealthier backgrounds had higher circumcision rates. The study attributed this to better access to health services and higher health literacy among higher SES groups. It recommended targeted outreach and subsidization programs to improve VMMC uptake among lower-income men.

Kenya has also seen studies focusing on SES and VMMC. A study by Otieno et al. (2023) in Nairobi aimed to assess the impact of socioeconomic factors on VMMC uptake. Using a survey methodology, the study found that men from higher socioeconomic backgrounds had higher circumcision rates. The study highlighted that financial constraints and lack of access to information were significant barriers for men from lower SES. It recommended targeted

financial support and educational programs to enhance VMMC uptake among lower-income populations.

Despite extensive research, gaps remain, particularly in understanding the specific barriers faced by lower SES groups in accessing VMMC services. This present study aims to bridge this gap by providing a detailed analysis of how socioeconomic status influences VMMC uptake in Turkana County, Kenya.

2.4.3 Cultural and Religious Beliefs as Determinants of Voluntary Medical Male Circumcision Uptake

Cultural and religious beliefs significantly influence the uptake of Voluntary Medical Male Circumcision (VMMC). This review examines how these beliefs impact VMMC uptake across various regions.

In the United States, a study by Johnson et al. (2021) investigated the role of cultural and religious beliefs in the decision to undergo circumcision among American men. The researchers used a mixed-methods approach, combining surveys and in-depth interviews. They found that cultural norms and religious practices, particularly within Jewish and Muslim communities, played a critical role in the decision to circumcise. Conversely, in groups with no strong cultural or religious mandate for circumcision, the rates were significantly lower. This study highlighted the need for culturally sensitive educational campaigns to increase VMMC uptake among diverse populations.

In China, Wang et al. (2020) conducted a qualitative study focusing on how cultural beliefs influence VMMC uptake. Through focus group discussions and interviews with healthcare providers and community members, the study revealed that traditional Chinese beliefs and practices did not traditionally include male circumcision, leading to lower acceptance rates. However, younger generations showed a shift towards accepting circumcision, influenced by globalization and increased awareness of its health benefits. The study called for integrating VMMC education into existing cultural frameworks to enhance acceptance.

In Germany, Müller et al. (2019) explored the impact of religious beliefs on VMMC uptake. The study utilized a cross-sectional survey of Muslim and Jewish communities, finding high circumcision rates due to religious mandates. In contrast, non-religious groups or those from Christian backgrounds had significantly lower circumcision rates. The study emphasized the importance of understanding religious contexts when promoting VMMC and suggested collaboration with religious leaders to advocate for the health benefits of circumcision.

In South Africa, a study by Dlamini et al. (2020) examined the influence of cultural beliefs on VMMC uptake in rural and urban settings. Using a comparative analysis, the study found that traditional beliefs and practices, such as initiation rites, influenced circumcision decisions. In rural areas, traditional circumcision as part of initiation rites was common, whereas in urban areas, VMMC was more prevalent. The study recommended culturally tailored approaches to promote VMMC, respecting traditional practices while highlighting medical benefits.

In Ghana, Owusu et al. (2021) investigated the role of cultural beliefs in VMMC uptake. Through ethnographic research, the study found that cultural beliefs significantly influenced circumcision practices. In communities where circumcision was not traditionally practiced, there was resistance to VMMC. The study highlighted the importance of culturally appropriate health education campaigns to address misconceptions and promote VMMC in culturally sensitive ways.

In Uganda, a study by Nsubuga et al. (2022) explored how cultural and religious beliefs affect VMMC uptake. Using a mixed-methods approach, the study found that Muslim communities had high circumcision rates due to religious beliefs, while other cultural groups showed varied acceptance levels. The study emphasized the need for culturally tailored VMMC promotion strategies, particularly in communities with no historical circumcision practices.

In Kenya, Kamau et al. (2023) conducted a study to understand the impact of cultural and religious beliefs on VMMC uptake in different regions. Using a cross-sectional survey and interviews, the study found that cultural norms and religious beliefs were significant determinants of VMMC uptake. Communities with strong circumcision traditions or religious mandates had higher uptake rates. The study recommended engaging cultural and religious leaders in VMMC advocacy to enhance acceptance and uptake.

Despite these insights, there remains a gap in understanding the nuanced ways in which cultural and religious beliefs interact with other factors such as age, education, and socioeconomic status to influence VMMC uptake. This present study aims to fill this gap by providing a detailed analysis of how cultural and religious beliefs affect VMMC uptake in Turkana County, Kenya.

2.5 Awareness on the Importance of VMMC

In a study of the views and expertise of VMMC for HIV prevention in historically non-circumcising populations in South Africa, (Redding et al., 2015) discovered that while the majority of the respondents (93.3%) had heard about male circumcision, few of them had been circumcised. The majority (64.4%) learned about VMMC from a network member who had

been circumcised, others (46.2%) from their own circle of relatives member, 28.8% via government campaigns, and fewer than one-fifth through official interaction with the health machine both at once or via the media (Shehata et al., 2019; Zhou et al., 2017).

Having heard of VMMC from fellow network members may not have instilled courage in the majority of the respondents to similarly seek VMMC because one-of-a-kind network members requested circumcision for one-of-a-kind personal, cultural, and spiritual needs.

Similarly, (B. Morris, Moreton, Krieger, Klausner, et al., 2022) discovered that even if a person is circumcised, he is still vulnerable to HIV infection in a study completed in South Africa where 87.8% of the respondents understood that. This implied that responders had accurate awareness of the relationship between scientific male circumcision and HIV exposure. This awareness can also be linked to the fact that 93% of the contributors had never heard that circumcision reduces HIV infections, as demonstrated by the World Health Organization report that VMMC reduces the probability of HIV transmission by 60% (WHO, 2016).

In contrast, the majority of respondents in a Botswana study were now not aware that scientific male circumcision minimizes the risk of HIV infections (Rupfutse et al., 2014). In a study conducted in Eastern Uganda, a few men did not see the value in scientific male circumcision, even if they were advised to continue using condoms after the procedure. They believed that, even if VMMC isn't a 100% safe prophylactic against HIV infections, the relevance of VMMC was underappreciated. This could be due to rigid cultural standards and a lack of civilization among some males, who are unable to easily interpret a few scientific facts (Pietro et al., 2017). (Rennie et al., 2015) discovered in a Namibian study that the majority (84.6%) of respondents no longer recognize that circumcision reduced the risk of HIV infections. However, when asked immediately whether circumcision reduces HIV exposure, many people felt it became true.

Ideally, scientific masculine circumcision decreases the danger of HIV infections by 60%. (WHO, 2016). However, many males, particularly those in rural areas and among the illiterate, are unaware of these numbers. An exploratory investigation completed in Haiti on the awareness, attitudes, and ideals about Male Medical Circumcision amongst a sample of health care suppliers discovered that the majority 90% of the contributors stated that MMC may reduce STIs (Marshall et al., 2017a). This could be due to the fact that respondents were health professionals who were expected to have received training on the efficacy of scientific male circumcision.

In a similar vein, (Mndzebele & Matonyane, 2019) discovered that even if a person is circumcised, he is still vulnerable to HIV infection in a study completed in South Africa where 87.8% of the respondents understood that. This implied that responders had accurate awareness

about the relationship between scientific male circumcision and HIV exposure. This awareness can also be linked to the fact that 93% of the contributors had ever heard that circumcision reduces HIV infections, as demonstrated by the World Health Organization file that VMMC reduces the probabilities of HIV transmission by 60% (WHO, 2017).

In a Kenyan newspaper investigation of the limitations of VMMC and the significance of continued condom use, it was determined that the primary source of information on MMC was radio (Odoyo-June et al., 2013). This can be ascribed to media liberalization, as there are numerous radio stations around the region, increasing radio accessibility to Kenyans. This became however met with difficulties of misinformation about the truth about VMMC because some radio stations no longer censor their programs.

Additionally, a cross-sectional learning agreed out in Uganda found that 50.6% of the 76 respondents received VMMC services in health facilities (George et al., 2016; Gilbertson et al., 2019; Hosseini et al., 2019; B. Morris et al., 2019). Another cross-sectional study completed in Cameroon and Senegal on early toddler men discovered that a lack of awareness about the hygiene advantages of male circumcision prevented fathers and mothers from consenting for their children to be circumcised. Respondents who were fathers and mothers discovered that they would be willing to circumcise their children if they were certain of the hygiene benefits associated with male circumcision.

A qualitative study of cops in Dares Salaam, Tanzania revealed that the majority of respondents were aware that VMMC improves penile cleanliness (Mahler et al., 2015; Toefy et al., 2015). This was ascribed to the fact that a circumcised penis no longer had the foreskin, which harbors urine and different fluids, promoting the growth of various bacteria and, ultimately, a higher risk of developing penile cancer. Given that the majority of the respondents were Muslims, they were aware of the cleanliness benefits of circumcision because it is also mentioned religiously as one of the primary reasons for circumcision.

In the study (Jargin, 2021), most men (88%) and women (71%) felt that getting a foreskin removed in a hospital by a health professional is a safe procedure.

Similar findings were seen in a study conducted in Uganda, where the majority of the men who were highly savvy about VMMC were aware of the protection of VMMC during surgery (B. J. Morris et al., 2016). Health-conscious men were aware that health care providers who completed VMMC in a safe health care setting maintained high levels of infection control and hence provided protection for males.

2.6 Influence of Access to health amenities on uptake of VMMC

Limited VMMC access remains a significant public health concern in low- and middle-income countries, posing risks to their populations' well-being (Huang et al., 2016b; Jiang et al., 2013a). Community elders, who serve as custodians of cultural traditions, have allegedly reported major health problems associated with the implementation of VMMC. Studies indicate that VMMC is an intervention that is 60% effective in preventing HIV infection (Omukunyi, 2022). By 2015, 80% of individuals (around 20.3 million people) had received VMMC interventions according to available data. Implementation efforts have already begun in African countries with high HIV prevalence (Mndzebele & Matonyane, 2019). Between 2015 and 2025, it is projected that the creation of 3.4 million new VMMCs will contribute to halting the spread of HIV (Bulled, 2018).

Due to the existence of various penile reduction techniques in Papua New Guinea, there has been interest in integrating VMMC with different HIV intervention programs in the past (Maduagwu et al., 2018; Oyeyemi et al., 2017). However, the Papua New Guinea Ministry of Health has encountered several encounters, counting the topographical separation of settlements, inadequate street organization, rough terrain, and constrained budget. Organizing and keeping suitable wellbeing statistics structures for accurate tracking, particularly in rural parts, presents challenges in Papua New Guinea (Moyo et al., 2015). Nevertheless, Papua New Guinea has successfully established a VMMC package for HIV avoidance in the East Sepik Province (ESP) and has demonstrated varying levels of achievement (Reed et al., 2012).

In Swaziland, the Ministry of Health mandated circumcision training for 60 medical physicians and nurses (George et al., 2016). In Zimbabwe and South Africa, healthcare practitioners who provide contraceptive services and treat STIs also perform male circumcisions or offer referrals, in addition to advising male patients about circumcision. Circumcision services have been more readily available in urban areas and hospitals rather than rural regions and clinics.

Both countries have high HIV prevalence rates, with 18% in Swaziland and 14% in Zimbabwe, yet only a small percentage of adult males have undergone circumcision: 10% in Zimbabwe 35% in South Africa. Training sufficient healthcare professionals to perform the procedures has been a priority in both countries. A survey conducted in Zimbabwe revealed a 45% acceptance rate of MMC, associated to 60% in Uganda, south Africa Kenya, and Tanzania (Ashengo et al., 2014; Pietro et al., 2017). The primary reasons cited for higher acceptability in those countries include procedural safety, affordability, and evidence of MC's preventive effects against HIV and STIs.

In Zimbabwe, where circumcision is uncommon, common reasons for not opting for VMMC include fear of pain, extended recovery and sexual abstinence periods, concerns about migraines and supposed charges, lack of spouse provision, and denial of HIV risk. Some of the reasons for choosing VMMC include improved hygiene, reduced risk of cervical cancer, and enhanced sexual performance (Jacobs, 2022). VMMC has become an integral part of Botswana's healthcare system, which may explain why they are unable to perform as many VMMCs as before.

To prevent men from resorting to dangerous methods due to lengthy delays, Menon et al. (2014) emphasized the importance of promptly matching supply with demand in Iringa, Tanzania, while ensuring service quality. In Tanzania, male circumcision is performed for both medical and cultural reasons.

Individuals in Tanzania who chose traditional male circumcision (TMC) due to its lower cost carried their own instruments to avoid health risks associated with sharing. The cost of MMC can range from $9 to $13 in US dollars, depending on the age of the individual. Consequently, circumcision may be delayed until the child reaches the appropriate age (B. Morris et al., 2017). The willingness of healthcare practitioners in poor countries to engage is important to the success of newly established adult MC programs (Strachan D.L. et al., 2012). Significant study on effective human resource participation has been conducted on the implementation of MC programs in African countries (Dickson et al., 2011). A large number of therapists, counselors, and support workers are required for these programs to be successful (Hankins et al., 2011). Surgical procedures are assigned to skilled non-healthcare practitioner physicians in several African nations, such as nurses or clinical authorities, in order to grow the workforce. Non-physicians, however, are not permitted to do the surgery in several countries (Yan et al., 2015a). Childhood circumcisions have been linked to fewer negative outcomes compared to those performed on adults, according to available data. For instance, in Jamaica (Duncan ND et al 2004), only 2.4% of cases reported experiencing headaches, while the percentages were 2.0% in Tanzania (Aldeeb, 2021; Ashengo et al., 2014), 2.4% in comoros0.3% in Nigeria, and over a span of 3-8 years (Ahmed A 2000). In a study involving 249 circumcised teenagers in Kenya and Nigeria, conducted at three primary hospitals, complications such as wound infections (2.8%), severe bleeding (1.2%), urine retention (1.2%), and edema (1.2%) were identified.

Effective political management plays a critical role in advancing this cause. Recently, several national leaders have taken steps to endorse VMMC. For instance, former President Jacob Zuma of South Africa announced plans to expand VMMC services in 2011. Similar directives were issued by former President Robert Mugabe of Zimbabwe, along with vocal lawmakers,

King Mswati III of Swaziland, and partisan leaders in Tanzania. Even nations that earlier trailed after, like Botswana, initiated measures in 2011 to accelerate the growth of facilities (Mahler et al., 2015).

(B. Morris et al., 2017; Sgaier et al., 2015) argue that opposition to circumcision stems from cultural reasons and concerns over pain. However, the use of anesthesia has alleviated the pain associated with the procedure. Other studies have identified various surgical risks, including rare cases of mortality. Some individuals are dissuaded by the fact that circumcision removes a portion of the penile shaft's sensitive tissue, resulting in reduced sensitivity. Some circumcised males have informed erectile problems, complications attaining orgasm, and early ejaculation.

Due to divergent findings, it is crucial to raise awareness and educate the public about the benefits and drawbacks of male circumcision, allowing individuals to make informed choices towards the eventual eradication of current HIV infections. In Bungoma, Kenya, where circumcision is a cultural norm, concerns have been raised about the safety of performing the procedure on a significant number of adult males (Mwandi et al., 2017). This is because a majority (two-thirds) of procedures are conducted by outdated or unreserved experts in informal situations.

According to (Huang et al., 2016a; Waruiru et al., 2022), four patients in South Africa suffered complete loss of penile appearance and function. Deprived post-operative coiled repair, including close-fitting strappings to control bleeding, resulted in a higher percentage of penile injuries. A study in Kenya and Nigeria revealed that 6% of hospitalized patients had partial or total loss of the penis, while associated mortality stood at 0.2% due to post-circumcision dehydration, serving as an additional test of the patient's resilience. Despite the widely recognized benefits of male circumcision, it is essential to consider and balance them against potential drawbacks.

In September 2008, Kenya initiated its nationwide VMMC initiative with the support of PEPFAR and the Bill & Melinda Gates Foundation (BMGF). The primary objective was to perform circumcisions on 86,000 men aged 15 to 49 by 2013 (NASCOP 2014). The Ministry of Health developed a comprehensive guideline called the National Guideline for Male Circumcision, which served as a blueprint for policymakers and implementers. This document aimed to ensure the delivery of harmless, affordable, and durable masculine circumcision facilities (Odoyo-June et al., 2013).

Since then, Kenya has conducted approximately 290,000 circumcisions, predominantly in the Nyanza region, achieving a coverage rate of 61.5%. Notably, by December 2010, significant

progress had been made. A devoted squad had been well-known, a communication policy and standardized resources had been advanced, a tracking and evaluation framework had been put in place, and 1,300 healthcare professionals, including surgeons, counselors assistants, , and contagion stoppage officials, had received training to deliver inclusive medicinal male circumcision services (WHO, UNAIDS, 2016).

Studies indicate that Kenya has surpassed 66% of its target for Nyanza Province (Maduagwu et al., 2012, 2014). Research conducted by Robert Bailey revealed that over 60% of young men would consider circumcision if they felt protected and if the procedure was affordable. Concerns related to cultural identity, fear of pain, and excessive bleeding were cited as barriers (Ali et al., 2018).

However, the Kenya AIDS Indicator Survey (KAIS) (KAIS report, 2014), which remains widely recognized, indicates that one out of every five circumcisions is performed by unqualified personnel. This highlights the importance of raising awareness and promoting the use of healthcare facilities and trained professionals by those seeking circumcision services. Kenya faces challenges such as limited resources, insufficient structure, deficiencies of apparatus and provisions, and difficulties in data management in implementing the program (National AIDS and STI Control Programme) (Onyango et al., 2021).

2.7 Influence of Social-Cultural Factors on Uptake of VMMC

Traditional circumcision is highly valued as a chance for young men to learn in a private setting about manly life skills that would help them mature into men (El-Gohary, 2015). The circumcised males teach the young initiates lessons like respect for women, how to treat elders, and how to look out for and take care of one's family while keeping them hidden from the public for up to 4 weeks (B. Morris & Cox, 2018). In spite of the fact that anesthetics are used to numb the pain during medical male circumcision, those who choose to remain uncircumcised or have their circumcision performed in a medical facility face ridicule for not having been circumcised traditionally (Bekker et al., 2017). For a number of reasons, numerous previous studies (Aldeeb, 2021) have discovered substantial support for traditional male circumcision in many African tribes.

The community's social pressure to continue with conventional circumcision has prevented change in the practice, despite the fact that many members of traditionally circumcising groups prefer VMMC (Mahler et al., 2015). Traditional male circumcision is still performed because of human resource limitations brought on by a shortage of medical professionals who are qualified to perform VMMC and a lack of materials (Kibansha et al., 2021). This has hurt

service quality and safety in priority countries as well as hindered efforts to scale up VMMC (Oyeyemi et al., 2017).

On the other hand, cultural practices and beliefs continue to be important driving forces behind traditional circumcision in Africa. For instance, 70% of young men in a community in South Africa that practiced traditional circumcision were forced to get it done because they feared being shamed if they underwent medical circumcision (Maponga et al., 2014). In Malawi, specifically where the study was done, the majority (85.4%) of circumcisions were traditional (Chatsika et al., 2020), which is connected to dangerous procedures that could spread HIV. Due to dangerous activities like ceremonial sex done after circumcision, another study indicated that more traditionally circumcised men (12%) were HIV-positive than uncircumcised men (10%) (Chatsika et al., 2020).

In a country like USA, culture is a major determinant of circumcision as compared to scientific evidence. According to a study done by Williams et al, 2020, the sensitization done to parents using literacy software revealing no scientific evidence on regular toddler circumcision did not deal with significant issues raised by parents to inform circumcision. According to one study, the most important motive was whether or not the father was circumcised because they wanted the son undifferentiated from his father. The mother and father were worried about their son's self-image and the friends he would have in the future if he didn't get circumcised. For nearly a decade, this practice has persisted despite policy pronouncements from the American Academy of Paediatrics and the American College of Obstetrics and Gynecology against routine circumcision (Bawazir & Sembawa, 2019; İlkiliç, 2018).

This also contributed to the exercise's long-term viability. However, those who did not circumcise their new-born offered reasons such as: it was no longer medically required, they were concerned about bleeding or infections, and they preferred to leave the judgement to the kid once he would be capable of determine later (Erbaş, 2019).

VMMC isn't often a free process in Zambia due to the nation's financial problems (Awad et al., 2017). In addition to costs, the adoption of circumcision has been hampered by some tribes' adherence to Christianity, as in Mfulira city. Christians recall it as an Islamic activity as well as being primitive. Culturally, historically non-educated people are also concerned about losing their cultural individuality by accommodating circumcision. On the other hand, Muslim civilizations practice it all over the country (Yan et al., 2015b).

The Luvale, luchazi Lunda, Mbunda, Ovimbundu, Chokwe, Nkangala, and other groups from the Northwestern and Western Provinces have been teaching MC for millennia (USAID, 2015). In 2012, Zambia launched a massive marketing campaign with the aim of circumcising one

million males by 2015. The President's Emergency Plan for AIDS Relief (PEPFAR), which contributed $29.4 million, assisted them in obtaining funds. According to Adamu et al. (2013), women in Zambia are beginning to request circumcision to prevent cervical cancer. It is no longer exclusively a male problem.

It is estimated that approximately 12 percent of Malawi's 13 million individuals have HIV. In 2011, the Malawian government established the VMMC program with the aim of circumcising 2,1 million persons by 2016. The Malawi Ministry of Health reported that as of the end of 2012, only 15,000 adult males had consented to circumcision. This represents 0.7% of the desired quantity. Negative advertisements, poor communication, a lack of human resources, faith, lifestyle, and traditional perspectives all contribute to the sluggish pace. (Chowdhury, 2018; Abolwafa, Farouk, & Mohammed, 2019).

Further, VMMC has a low acceptance rate because 80% of Malawians are Christians and no longer perform circumcision. As VMMC grew, the number of new HIV infections decreased, from 70000 in 2011 to 50000 in 2012. In Southern Malawi, where migrant groups have a high HIV prevalence and account for roughly 70% of the country's HIV infections, circumcision is quite prevalent (Fahmy, 2020).

Only Yaos and Moslems circumcise for religious reasons, and the majority of Malawians "do not want to grow up to be Moslems," according to Dr. Mary Shaba, who is in charge of HIV/AIDS and nutrition in the Office of the President (Yan et al., 2015b). People in Malawi are hesitant to enroll in the VMMC program due to the disparity between the Christian North and the Muslim South regarding the HIV pandemic. This difference no longer corresponds with disparities in circumcision rates (Yan et al., 2015b).

Even though 26% of Swaziland's population has HIV and neonates are not circumcised, both Swaziland and Ethiopia had met at least 20% of their 80% objective by the end of 2011. In 2006, South African President Thabo Mbeki signed a law prohibiting the circumcision of minors under the age of 16 unless medically or culturally necessary. This was created to alleviate the dreadful migraines and fatalities caused by traditional celebrations. Between 1995 and 2004, 216 individuals had their genitalia removed, and 243 individuals passed away (Ozler, 2021).

Many people in East Africa, particularly the Bantus, celebrate the end of puberty by performing circumcisions. The Maasai consider uncircumcised males to be adolescents and cowards who lack masculine characteristics. Consequently, circumcision is associated with typically masculine characteristics such as fortitude, maturation, and sexual preparedness (Ahmad et al.,

2015), whereas uncircumcised men are viewed as less mature and more likely to have poor reproduction (Bawazir & Sembawa, 2019).

Tanzania has a national HIV incidence of 5.6% (World Health Organization: World Health Statistics, 2017), with individual HIV prevalence ranging from 1% to 15%. Around 70% of adult males are circumcised (WHO, 2016), but some places charge as much as 95%, while others charge as little as 24% (Kim, 2014; Yan et al., 2015b).

Such variances may be identified by way of the influence of lifestyle, traditions, and religion (Mndzebele & Matonyane, 2019). According to (Jargin, 2021), In their study of MC as a preventative measure against HIV infections in Tanzania, they discovered that women looked down on circumcised men because they were uninformed of the disease conveyed in the white powder (dry seminal fluid) produced after intercourse. They also stated that an uncircumcised penis should be washed on a regular basis to prevent the build-up of fluids that cause an unpleasant odour.

The non-secular ideals encouraged this exercise in that Christians connect it to Jesus' circumcision when he was 8 days old, whereas Muslims agree that they can't take part in mosque offerings or burial ceremonies because it's far obligatory for all as an affirmation of their relationship with God (Falcão et al., 2018). Circumcision is a cultural exercise for a few of them as they transcend from childhood to maturity.

Most people, nevertheless, have a undesirable arrogance concerning male circumcision since infant, believing it's extremely dishonourable to be exposed to others, searching for offerings at an older age alongside more young guys. For example, in Tanzania's Iringa and Njombe districts, around 6% of VMMC consumers are 25 years old or older (Menon et al., 2014). The Ugandan and Kenyan VMMC programs have also testified a comparable sample of young VMMC consumers, supporting this cultural preference for circumcision at a younger age (Dickson et al., 2016).

Most uncircumcised men live in villages, and those who travel to areas where circumcision is common endure stigma and prejudice. As a result, they feel incomplete and inadequate as men. In general, information, concepts, beliefs, and attitudes encouraged MMC acceptability in Tanzania (Yan et al., 2015b).

According to the Kenya Aids Indicator Survey (KAIS), with the exception of a few specialized tribes such as the Turkana and the Luo, 85% of males in Kenya underwent their circumcisions, primarily as a rite of passage but also for religious and scientific reasons. According to USAID Project Quest (Odoyo-June et al., 2013; Onyango et al., 2021), circumcision is not a cultural practice among the Turkana of Kenya.

Because the bulk of Turkana's historical foes, including the Pokot, Samburu, and Marakwet, circumcise men as a rite of passage, adopting it would have disastrous consequences. Accepting circumcision is therefore regarded cultural treason and a degrading of a time-honored physiological method of confirming tribe identification. The Turkana, on the other hand, have a particular system known as Asapan, which is supposed to elevate select individuals to the status of senior elder (B. Morris et al., 2016).

Those who regularly circumcise, on the other hand, claim that sickness prevention surpasses cultural practice. According to Ali et al. (2018), 13.2% of uncircumcised men in Kenya have HIV infections, compared to 3.9% of circumcised men. Among the 19840 people polled, the frequency was higher among uncircumcised men aged 25 to 54 than those aged 15 to 24.

The Coastal Province (97.2%) and North-Eastern Province (97.1%) had the highest percentages of circumcised males, while Nyanza Province had the lowest at (48.3%), with a wide ethnic range, with the Luos value being 17% and the Kisii community value being 99% (Odoyo-June et al., 2012; Onyango et al., 2021; Oyeyemi et al. The VMMC software installation in Nyanza

In general, it has been difficult to persuade Turkanas to embrace circumcision because it has been used to mock or even undermine their political leadership. The Turkana Elders must be included since they are cultural protectors. As a result, rather than promoting VMMC as a cultural activity, it was required to market it as a public health program. While customers who come in for circumcision do not receive incentives, practitioners actively used circumcised people to mobilize others at a rate determined by recruit abilities.

2.8 Influence of Level of Education on VMMC

The United Kingdom used to circumcise infant boys, much like it was done in the United States a century ago (El-Gohary, 2015). In the UK, getting a circumcision depended on your social and economic class (B. Morris & Cox, 2019). Consequently, according to army records, 85% of high-class males and 50% of lower-class men in England underwent circumcision prior to the Second World War (Gollaher 1994, Gairdner 1949). 35% of these treatments, according to (Kurth et al., 2019), were carried out for medical purposes. According to (Huang et al., 2016a), by the 1920s, the majority of doctors and child-care education regarded circumcision as a necessary component of responsible parenting.

(Fahmy, 2020) claims that during the 1920s, the majority of doctors and parenting guides began to view circumcision as a necessary component of responsible parenting. After that, the exercise rapidly decreased in the UK, although it peaked in Australia in the 1950s at over 80%.

(Redding et al., 2015). The decline in newborn circumcision rates began when the Australian Paediatric Association advised against regular circumcision in 1971. (El-Gohary, 2015; Redding et al., 2015; Warees et al., 2022). They preferred to wait until the kids were old enough to weigh the pros and cons of circumcision and make an informed choice (El-Gohary, 2015).

According to a study published in the Journal of the American Medical Association by (Omukunyi, 2021), the well-educated are more likely to perform routine circumcision on their children as a result of class distinction.

A lack of understanding of circumcision's importance as an intervention technique against HIV transmission has been one of the main barriers to its acceptance in many African communities (Ashengo et al., 2017). A Christian tribesman in Lusaka, Zambia, made the decision to support circumcision after learning about the benefits of the procedure for health, including hygiene and a decline in HIV infection rates (Bekker et al., 2012; Huang et al., 2016).

Tanzania began its VMMC program in regions where circumcision is not a religious need or a stage to pass through throughout childhood, puberty, or adolescence. They had at least 47% of their goal accomplished by 2012. However, this mostly affected younger men-those between the ages of 15 and 25-from the wealthy and well-educated sectors (Mahler et al., 2015). VMMC adoption is also connected with male literacy levels as shown by their educational levels. Rural males are less educated, underserved, and have a low uptake of VMMC services, whereas metropolitan males have a higher prevalence of having circumcised (Mwandi et al., 2017). This is because adult males, mainly in rural areas, lack enough information about VMMC and STI prevention due to poor information dissemination mechanisms and illiteracy.

This means that enhanced access to information and services correlates with increased adoption of VMMC services.

2.9 Theoretical Framework

Interactive philosophies help programmers recognise why humans perform the system they do. As a result, programs are attempting to broaden strategies that are entirely founded on beliefs that toughen wholesome behaviour or extrude harmful behaviour. This investigation was guided by the Diffusion of Innovations (DOI) theory, which was first advanced by Everett Rodgers in 1962. (Dearing et al., 2021) defined innovation as a concept that is perceived as novel by an individual. The DOI theory describes diffusion as the procedure of collaborating an invention amongst fellows of a societal system (Chung et al., 2021). According to (Dearing, 2015), adoption means deciding to fully implement an invention as the finest progression of action.

The concept is a theory that describes how new ideas spread throughout a population. It provides insight into what characteristics cause improvements to occur; rather than encouraging people to extradite, it views extradition as the reinvention of goods and behavior to meet people's wants. As a result, the invention must have a relative benefit, such as monetary gain or social reputation. Another critical factor is compatibility with prevailing beliefs and performs: the invention must be consistent with contemporary values, going beyond enjoyment and human needs (Enyia & Nwuche, 2020).

Second, peer-to-peer discussions are critical: according to this philosophy, objective techniques such as media ads can spread information about new advances, but adoption occurs through dialogue. This is because it is the ones who have correctly followed the invention who can assure others of considerably less danger or uncertainty, forexample shame, monetary losses, and so on. The early adopters are an exception to this danger since they generally regard the risks as minor, either because they are more aware or because they are financially secure (Enyia & Nwuche, 2022).

The rest perceive excessive risks in extrade and may require assurance from close friends that the innovation is good. As a result, many diffusion-fashion efforts often use peer networks in which appropriately linked people are recruited to spread new ideas via their very own social networks. The theory's strength is that it is based on a successful integration of a huge amount of empirical data. Furthermore, it's far really sensible and will continue to be useful in this day and age or even later because new ideas are regular occurrences and are subtle for people to accomplish (Chung et al., 2021).

This concept inspired marketing, advertising, and promotional communication theories. It has provided useful guidance for record-keeping programs in various countries. For example, USAID employed it to assist developing nations in adopting agricultural technologies as they competed for influence with the USSR (Dearing & Singhal, 2020).

The concept, however, suffers from the limits of being linear and supply-ruled because it examines communication strategy through the eyes of the elite, who ultimately determine whether or not to share the finding. It also downplays the importance of the media by restricting its influence to swaying innovators and early adopters who then influence others, despite the reality that the media could be highly useful in laying a basis for institutional dialogue supported by outside retailers. These no longer ensure long-term achievement in the acceptance and operation of reforms. Rogers also failed to recognize that humans can be inventors and primary adopters but may not immediately implement an innovation for a variety of reasons, including faith and culture (Enyia & Nwuche, 2022). Such cases can be addressed by

integrating the Zero tolerance class into the adopters' categories. Despite these flaws, the DOI theory is highly useful since opinion leaders and exclude retailers have a variety of influences on the early majority, the late popular, and the stragglers, particularly on the influence and choice tiers. However, the role of the media must be considered at every stage, from expertise creation to influence, choice, execution, and validation.

2.9 The Conceptual Frame Work

The framework emphasizes the link between the study's independent and dependent variables. As determinants of voluntary medical male circumcision service uptake among men, the independent variables include education level, level of awareness, accessibility of VMMC services, and cultural-related factors (Abun et al., 2019). The uptake of voluntary medical male circumcision will be the dependent variable. The following factors will be used to assess VMMC awareness: awareness of its importance, awareness of where to get VMMC services, awareness of when to get VMMC services, the hygiene benefits of male circumcision, awareness of care after VMMC, and of the time required to heal after VMMC. Availability of VMMC services, health education about VMMC, availability of health care providers, user rates, privacy at the health care facility, availability of counselling and testing services, waiting time at the health facility, distance to the health facility, level of government funding for VMMC services, and specific days of operation will be measured (Dearing, 2015).

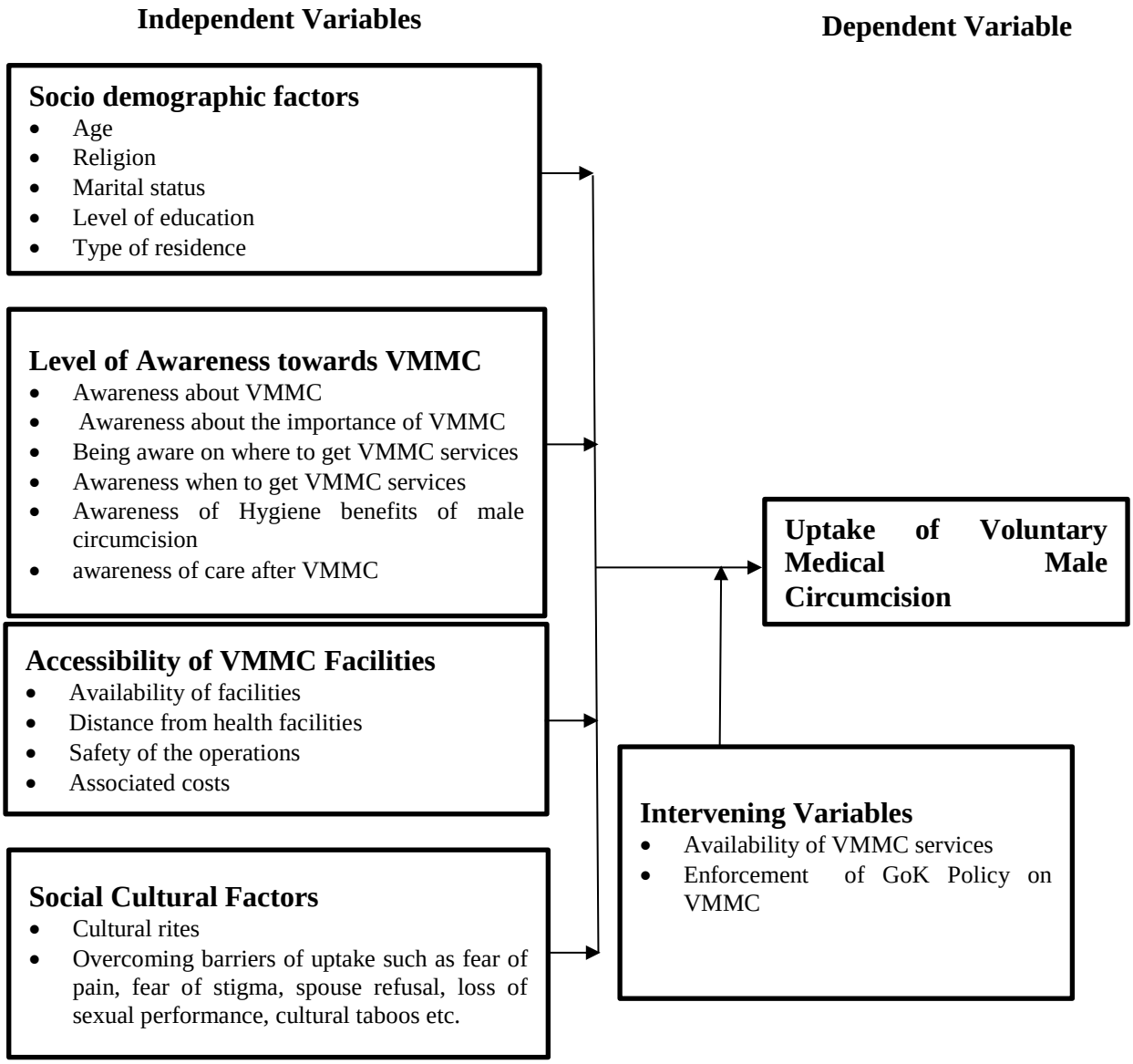

Figure 2.1: The Conceptual Framework

2.10 Research Gap and Theoretical Relevance

Research on Voluntary Medical Male Circumcision (VMMC) has generated robust evidence regarding its role in reducing heterosexual HIV transmission and improving men's sexual health in many high-prevalence settings. Yet critical knowledge gaps persist in Turkana County, Kenya, where VMMC coverage remains at just 12.7 percent compared with the national average of 84 percent (KHIS, 2023). Existing studies have largely concentrated on areas such as Nyanza Province—where circumcision aligns with long-standing cultural rites—and have overlooked regions where non-circumcising traditions prevail (Odoyo-June et al.,

2013). Turkanaland presents a markedly different landscape: pastoralist livelihoods, seasonal mobility, and the Asapan cultural system sustain historical opposition to circumcision, yet no prior research has systematically explored how these socio-cultural dynamics deter VMMC adoption (Ali et al., 2018; Nweze et al., 2017).

Awareness campaigns in other sub-Saharan contexts have demonstrated that knowledge alone does not guarantee uptake of health innovations (Rupfutse et al., 2014). In Turkana, anecdotal reports suggest high levels of awareness about HIV prevention but a persistent disconnect between that awareness and actual VMMC participation, especially among men over age 25—a cohort at elevated risk but whose uptake rates hover below 6 percent (Jennings et al., 2018; Morris et al., 2019; KENPHIA, 2018). No empirical study has quantified this "awareness-action gap" within Turkana County nor examined how information channels and messaging content influence decisions about circumcision.

Geographic isolation and limited health infrastructure further complicate the picture. Mobile pastoralist communities often travel vast distances with their herds, yet existing VMMC services rely primarily on static clinics and short-term outreach that do not align with migratory patterns (Mwaniki et al., 2023). The absence of research into how mobility affects service utilization leaves implementers without guidance on adapting delivery models for Turkana's nomadic populations. Similarly, most VMMC initiatives have targeted adolescents through school-based platforms, implicitly excluding the 20–49 age group that carries disproportionate HIV burdens in this region (KENPHIA, 2018).

This study seeks to fill these gaps through a mixed-methods investigation of VMMC uptake determinants in Turkana County. Ethnographic inquiry will unpack cultural narratives, including interpretations of Asapan tradition as an antithesis to circumcision, while community surveys will measure the extent and drivers of the awareness-action gap. Geographic information on migratory routes and health facility locations will inform analyses of access

barriers, and age-stratified data will illuminate disparities in participation among men aged 20–49 years. Drawing on these findings, the research will propose tailored interventions—such as mobile clinics synchronized with pastoralist calendars and elder-led sensitization—to enhance VMMC uptake in Turkana's unique context.

The study is theoretically anchored in Rogers's Diffusion of Innovations (DOI) framework (Rogers, 1962), which conceptualizes adoption as a socially mediated process. While prior VMMC research has employed DOI to categorize adopters and identify opinion leaders, it has rarely addressed the concept of cultural reinvention—how communities reinterpret medical innovations to fit local worldviews (Dearing & Singhal, 2020). This research advances DOI in three key ways. First, it assesses cultural compatibility by examining whether and how VMMC is perceived as a "betrayal" of Turkana identity, and which local belief systems can be leveraged to reframe circumcision as congruent with community values. Second, it investigates peer-network effects in a setting where trust in external health messages is low and where early adopter narratives—potentially shared through intra-community networks—may catalyze broader norm change (Kibansha et al., 2021). Finally, the study explores reinvention by documenting how Turkana men reinterpret VMMC benefits—emphasizing hygiene, cleanliness, and social acceptance—rather than relying solely on HIV prevention messaging.

Turkana County's HIV prevalence of 6.8 percent—exceeding the national average of 4.5 percent—and its stark contrast in VMMC coverage (12.7 percent versus 84 percent nationally) highlight an urgent need for context-driven strategies (KHIS, 2023). Insights from this research will inform not only local policy and program design but also offer transferable lessons for other marginalized, non-circumcising communities across East Africa, such as Nilotic groups in South Sudan. By integrating socio-cultural analysis with robust DOI theory extensions, this study aims to chart a path toward more equitable and effective HIV prevention interventions.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methods for the analysis. Among the work's critical components are the study's design, target audience, participant selection, research tools, validity and reliability of data gathering tools, data collection processes, data analysis methodology, and ethical issues. The purpose of this research was to look at the factors that influence Turkana County's adoption of voluntary medical male circumcision (VMMC).

3.2 Study Area

The study area was in Turkana County that targeted Turkana Central, Turkana North and Turkana South. The areas were chosen to represent urban area, rural area and peri-urban. These unravelled the social-cultural factors, level of education, and awareness of VMMC services in these communities. Turkana County is politically, socially, and geographically isolated from the rest of Kenya. The Turkana, in instance, are pastoralists who have just recently begun to settle in towns. 45,368 people live in Lodwar, out of an estimated 800,000 people. The majority of the last remaining in dispersed groupings (Mwandi et al., 2011). Approximately 95% of citizens are poor (Onyango et al., 2021), attendance in primary school is low, and dropout rates amongst ladies are the highest in Kenya, with only 7% literacy projected amongst ladies in the County (Riess et al., 2018). Turkana County has 13 hospitals, 19 Health Centres, and 177 Dispensaries, the average distance to a facility is 35 kilometres (Turkana County Integrated Development Plan 2017-2022). Based on the above research reviews and understanding that HIV incidences are increasing in the study region, this research intended to investigate the determinants of uptake of voluntary medical male circumcision (VMMC) in Turkana County, Kenya.

3.3 Research Design

An analytical cross-sectional design was selected to capture both VMMC participation and its potential determinants simultaneously within the target population, providing a clear snapshot of associations at a single point in time. This approach offered a cost-effective, time-efficient means of studying a one-off event such as circumcision, avoiding the logistical and ethical complexities of longitudinal follow-up or retrospective case–control categorization, while still permitting quantification of exposure–outcome relationships essential for informing targeted interventions.

3.4 The Target Population

A focus on men aged 20–49 years reflects both epidemiological and programmatic priorities in Turkana County. National HIV surveillance data identify this age group as bearing a disproportionate burden of new infections, with incidence peaking among men in their third and fourth decades; targeting VMMC to this cohort therefore maximizes preventive impact (KENPHIA, 2018). World Health Organization guidelines likewise recommend concentrating VMMC efforts on sexually active adults, who derive the greatest immediate reduction in HIV acquisition risk (WHO, 2022). In Turkana County, the 2019 national census reported a total population of 204,357, of whom 51.6 percent were male (Central Bureau of Statistics, 2020). Approximately 105,449 men thus fall within the 20–49-year age bracket—the demographic most in need of VMMC services and simultaneously underrepresented in current uptake figures. Restricting the study to this age range ensures that findings speak directly to the group whose circumcision status most influences HIV transmission dynamics and informs the tailoring of interventions to local prevention targets.

3.5 Inclusion Criteria

Men aged 20–49 years residing in Turkana County for at least 12 months, who self-identified as belonging to non-circumcising communities (Turkana ethnic group), and who provided informed consent were included. The extended residency period ensured participants had sufficient exposure to local cultural norms and VMMC awareness campaigns, addressing the cultural embeddedness of circumcision practices.

3.6 Exclusion Criteria

Men who are not of sound mind and critically ill were excluded from this study as well as those respondents who didn't consent were not coerced to participate.

3.7 Sampling Technique and Sample Size

3.7.1 Sampling Technique

Purposive selection of Turkana Central, Turkana North, and Turkana South sub-counties reflected an intent to capture the full spectrum of demographic, cultural, and service-delivery contexts across the county. Turkana Central was included because it hosts the county headquarters and the highest concentration of health facilities offering VMMC, Turkana North for its remote, predominantly pastoralist populations with the lowest VMMC coverage, and

Turkana South to represent an intermediate profile where outreach programs have achieved moderate uptake. This tri-site strategy ensured that findings would be generalizable to areas with varying levels of access, mobility patterns, and cultural attitudes toward circumcision.

Households within each selected sub-county were sampled systematically to achieve a representative cross-section of the population. Household lists obtained from sub-county registries were updated through rapid field mapping; dividing the total number of occupied households in each stratum by the target stratum-specific sample yielded a sampling interval (K). In practice, K = 3 emerged when sub-county listing exercises produced an average of one eligible household for every three dwellings visited, balancing efficiency with logistical feasibility across sparsely settled areas. Field teams began from a randomly chosen start point and then visited every third occupied household, ensuring uniform coverage without clustering around major access roads.

Within each selected household, stratified random sampling was employed to choose a single respondent when more than one man aged 20–49 years resided there. Each household constituted its own stratum for this stage, and eligible men were listed and assigned numbers. A simple random draw of one number determined the participant, eliminating intra-household bias while preserving proportional representation of different age and social groups. This layered approach—purposive sub-county selection, systematic household sampling with a clearly defined interval, and within-household randomization—provided a robust framework for identifying the socio-demographic, cultural, and service-access determinants of VMMC uptake across Turkana County.

3.8 Sampling Frame

According to (Krejcie & Morgan, 1970), in a population of between 75,000 and 1,000,000 a representative sample size of 384 can be certain to represent the population. This study used a population of 387 computed from Table 3.

Table 3.1: Sampling Grid

Sub-County	Population	Households	Sampling Technique	Health Officer	Sampling Technique	Total
Turkana Central	93,145	5776	Stratified	1	Purposive	5777
Turkana North	32,810	2177	Stratified	1	Purposive	2178

Turkana South	78,402	3277	Stratified	1	Purposive	3278
Sub-Total	**204357**	**11230**		**3**		**11233**

Source: 2019 Kenya Population and Housing Census: Volume 1

3.9 Sample size

Sample size refers to the number of items to be selected from the universe to constitute a sample (Kothari, 2014). Slovin's formula is a very general equation used when one can estimate the population but have no idea about how a certain population behaves. The formula is described as:

$$Sample\ Size\ =\ N\ /\ (1\ +\ N * e^2)$$

$Where;$

- $n\ =\ number\ of\ samples$
- $N\ =\ population\ size$
- $e\ =\ margin\ of\ error$

$$n = 11233/(1 + 11233\ (0.052\ )$$

$$n = 11233/(1 + 11233\ (0.0025\ )$$

Sub-County	Population	Population Sample size
Turkana Central	93,145	176
Turkana North	32,810	63
Turkana South	78,402	148
Total Population	204,357	387

$$n = 11233/(1 + 28.0825\ )$$

$$n = 387$$

A proportionate sample for each sub-county was calculated and then later the participants was recruited for each sub county based on their respective populations as shown below.

Table 3.2: Sample size per respective sub-county

e.g. for

Turkana Central

$$\frac{Turkana\ Central\ Population\ X\ Total\ Sample}{Total\ Population}$$

$Therefore,$

$$Turkana\ Central\ Population = 93,145$$
$$Total\ Sample\ Size\ = 387$$
$$Total\ Population = \ 204,357$$

3.10 Research Instruments

A pre-tested questionnaire was administered to collect primary data. The use of questionnaire was justified since it is an effective way of collecting information from large samples in a short period of time and at a reduced cost. In addition, a questionnaire facilitated easier coding and analysis of data collected since it was standardized.

The questionnaire was divided into sections according to the study objectives. The first part of the questionnaire was introduction and it explained the purpose of the questionnaire stating clearly that data obtained was for pure academic purpose. Section 1 required the respondent to provide personal details and direct the respondent on which section to answer. Section 2 of the questionnaire was for respondents while section 3 contained questions from variables.

Key informants Interview guide was used for the chosen health officers. In this instance, the information was obtained through interaction between the researcher and interviewee, where the researcher used a variety of probes and other techniques to obtain detailed information on determinants of uptake of voluntary medical male circumcision (VMMC).

3.11 Pretest of research tools

A preliminary pre-test of the survey instrument was conducted in Loima Sub-County, chosen for its demographic and logistical resemblance to the primary study sites—it shares similar pastoralist settlement patterns, road-access challenges, and socio-cultural attitudes toward health interventions. Ten percent of the planned sample (n≈39 households) participated in this exercise, enabling assessment of question clarity, flow, and cultural sensitivity. Ambiguous wording and contextually inappropriate examples were revised following field feedback, and the timing of interviews was adjusted to match local daily routines. Treating this activity explicitly as a pre-test ensured that instrument refinements were based on real-world conditions without contaminating data from the main study areas.

3.12 Data Validity and Reliability

According to (Sanders et al., 2002), research is only reliable if it analyses the topic it was intended to investigate and can be independently verified. The validity of the data gathering tools were improved through interactions with the survey respondents to address any issues.

Grinnett (2003) provides a definition of instrument reliability, which refers to the accuracy of a measuring tool. It guarantees that the equipment produces consistent outcomes when utilized by multiple researchers. To assess the Alpha strengths of the piloted instrument, the Cronbach Alpha reliability test was conducted. According to the recommendation of Kathuri and Pals (2003), a Cronbach Alpha test value of 0.7 is preferred. Cronbach Alpha is suitable for handling items with numerous responses. The researcher ensured that the questionnaire meets the required reliability standard of a = 0.65.

3.13 Data Collection Procedures

The investigator applied for a licence from National Commission for Science, Technology and Innovation. A research assistant was trained by the researcher to assist in the data collection. Data was collected using questionnaires by the researcher together with the trained research assistant. The researcher moderated the discussions while the research assistant recorded the proceedings (using the tapes, writing, video recordings,); for later triangulation.

3.14 Data Management

3.14.1 Data Cleaning

Data cleaning is the method of ascertaining and adjusting or eliminating mistakes, discrepancies, and incorrectness in the collected data. In this study, data cleaning involved checking for missing values, outliers, and any other inconsistencies in the dataset. These issues were addressed by either imputing missing values, removing outliers, or correcting errors based on predefined criteria or expert judgment. The cleaned dataset was then be prepared for further analysis.

3.14.2 Coding of Data

Coding of data involved assigning numerical or categorical codes to represent different variables in the dataset. In this study, variables such as level of education, awareness, accessibility of circumcision facilities, and social-cultural factors was coded. The coding process helped in organizing and categorizing the data, making it easily analyzed.

3.14.3 Data Entry

Data entry refers to the process of transferring the collected data from the data collection tools (e.g., questionnaires) into a digital format, such as a spreadsheet or a database. This process involved careful and accurate transcription of the data to minimize errors. Data entry was

performed manually. Once the data was entered, it would undergo data cleaning and coding processes as described above.

3.14.4 Data Analysis

3.14.4.1 Quantitative Data Analysis

Quantitative data in this study included variables such as the level of education, awareness scores, accessibility measures, and social-cultural factors on a numerical or categorical scale. The data collected through a structured questionnaire was processed using Microsoft Excel and STATA version 15. Various statistical techniques was applied, such as descriptive statistics (mean, standard deviation), inferential statistics (chi-square tests), correlation analysis, and regression analysis. Odds ratio (OR) was used as the measure of association and. Crude odds ratio(OR), and adjusted odds ratio(aOR) was calculated for measures of association, the significance level was reported at 95% confidence intervals; associations with a p-value <0.05 were considered statistically significant for determinants associated with uptake of VMMC,. All determinants associated with VMMC uptake with a p-value of less than 0.05 under bivariate analysis were subjected to stepwise backward logistic regression to create a model of variables that were subjected to multivariate analysis to identify determinant independently associated with the VMMC uptake.

3.14.4.2 Qualitative Data Analysis

Qualitative data in this study was obtained through key informant interviews. The data was transcribed, and organized. Using QSR Nvivo software, common themes, patterns, or categories were identified within the data and systematically analyzed to draw meaningful conclusions and interpretations. The themes were used to triangulate the quantitative data collected from the households.

3.15 Ethical Consideration

This study ensured ethical conduct by obtaining informed consent from all participants. The researcher explained the study's purpose, objectives, and guaranteed respect for participants' opinions, privacy, and rights. Participants could withdraw at any time during the study if they wished not to continue or answer specific questions.

The questionnaire was carefully designed to avoid questions that could cause emotional distress or be demeaning. This was achieved by calling participants beforehand to remind them of the study's intent.

To ensure participant privacy and confidentiality, the researcher:

- Maintained anonymity by not asking for names.
- Safeguarded collected data with restricted access.
- Guaranteed confidentiality throughout the study and afterward.
- Avoided publishing participant identities.

The researcher and assistant ensured human dignity was respected throughout the research process. Study results were to be used only for academic purposes.

Approvals

- Ethical approval was sought from the Mount Kenya University Ethics and Research Committee (reference number MKU/ISERC/3164)
- Approval was also obtained from the National Commission for Science, Technology, and Innovation (NACOSTI)- reference number 295643

Permissions

- Permission was sought from relevant authorities in Turkana County, including national and county levels, and the county health department's training committee.
- Permission was obtained from the Mount Kenya University (MKU) postgraduate school.

Informed consent was finally obtained from all research participants.

CHAPTER FOUR
RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents study results from analysed data. The chapter's presentation focuses on Bivariate, bivariate and multivariate analysis on socio-demographic, uptake, awareness, accessibility, socio-cultural factors related to uptake of VMMC services. The chapter also presents study findings from thematic analysis from key-informant interviews.

4.2 Response Rate

The response rate is a crucial metric in survey research, as it reflects the proportion of individuals who participated in the study relative to those who were approached or eligible. In the present study on the Determinants of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County, a total of 387 individuals were approached, out of whom 370 consented and participated in the study. This yielded a high response rate of **95.6%**, as summarized in Table 4.1.

Such a high response rate indicates a strong level of engagement and willingness to participate among the target population, which enhances the reliability and validity of the study findings.

Table 4.3: Response Rate

Issued Questionnaires	Response Rate	Percentage (%)
387	370	95.6

Source: Researcher (2023)

4.3 Bivariate Analysis of the Social-Demographic characteristics for Voluntary Medical Male Circumcision services among men in Turkana County

The study enrolled 370 participants, achieving a high response rate of 95.6%. As presented in Table 4.2, the majority of respondents (63.2%) were aged between 20 and 29 years, highlighting the potential impact of targeting this age group to enhance the uptake of Voluntary Medical Male Circumcision (VMMC) services. Geographically, most participants were from Turkana Central (45.9%), indicating a potential need for enhanced outreach strategies in Turkana North and Turkana South.

Religious affiliation showed a strong Christian presence among respondents (81.1%), which may offer a valuable platform for VMMC advocacy through faith-based initiatives. Regarding marital status, 46.5% were married, followed by 39.5% who were single. Education levels

varied, with 36.8% having no formal education and 32.7% having attained secondary education. These findings suggest that VMMC messaging may benefit from simplified, inclusive communication strategies.

In terms of housing, temporary structures were the most common (49.7%), suggesting the need for mobile or adaptable service delivery models. A majority (76.2%) adhered to the Turkana cultural rite (Asapan), underscoring the necessity of culturally respectful VMMC programming. Furthermore, 61.9% of participants resided within 5 kilometers of a VMMC center, emphasizing the role of geographic accessibility in service uptake.

These demographic insights underscore the importance of designing targeted, culturally appropriate, and geographically accessible interventions to enhance VMMC adoption among men in Turkana County.

Table 4.4: Socio-Demographic Characteristics of Study Participants (n = 370)

Characteristic	**Category**	**Frequency**	**Percentage (%)**
Age	20–29	234	63.2
	30–39	76	20.5
	40–49	36	9.7
	Above 50	24	6.5
Sub-county	Turkana Central	170	45.9
	Turkana South	137	37.0
	Turkana North	63	17.0
Religion	Christian	300	81.1
	African Tradition	49	13.2
	Muslim	11	3.0
	Others	10	2.7
Marital Status	Married	172	46.5
	Single	146	39.5
	Divorced	35	9.5
	Widowed	17	4.6
Education Level	No Formal Education	136	36.8
	Primary Education	52	14.1
	Secondary Education	121	32.7

	Tertiary Education	61	16.5
Type of House	Temporary	184	49.7
	Semi-Permanent	136	36.8
	Permanent	50	13.5
Most Accepted Cultural Rite	Turkana Cultural Practice (Asapan)	282	76.2
	Circumcision	88	23.8
Distance to Nearest VMMC Centre	Within 5 km	229	61.9
	More than 5 km	141	38.1

Source: Researcher (2023)

4.4 Bivariate Analysis of Uptake factors for Voluntary Medical Male Circumcision services among men in Turkana County

The study revealed substantial engagement with Voluntary Medical Male Circumcision (VMMC) services among the male population in Turkana County. As summarized in Table 4.3, 66.8% of the respondents reported having ever received VMMC services, and 64.7% had been circumcised at the time of the study. Among those who had undergone VMMC, 90.7% received the actual circumcision service, while 88.7% received health education on VMMC. A large majority (97.6%) received their services at a health facility, reinforcing the central role of formal healthcare structures in VMMC delivery.

Counseling coverage was notably high, with 73.3% receiving general counseling on VMMC and 83.8% receiving HIV pre-test and post-test counseling. Post-circumcision follow-up was provided to 64.0% of those circumcised, indicating reasonably strong continuity of care.

Motivations for seeking VMMC services were primarily prevention-oriented. The most common reason cited was to prevent HIV (26.6%), followed closely by hygiene-related purposes (25.9%). Additional motivators included a desire to know one's HIV status (18.0%), encouragement from others (11.1%), advice from health workers (11.1%), and treatment of STIs (5.3%).

Complications were reported by 47.1% of circumcised individuals, with the most prevalent being swelling (28.7%), pain after circumcision (22.1%), and drug reaction (18.7%). Despite this, 77.8% of those who experienced complications confirmed that they had been adequately managed, suggesting a relatively effective clinical response.

These findings emphasize the importance of integrated VMMC programs that combine clinical service delivery, comprehensive counseling, targeted health education, and structured follow-up. The strong preventive motivation among clients also underlines the relevance of VMMC in broader HIV prevention strategies across Turkana County.

Table 4.5*:* Uptake Factors for Voluntary Medical Male Circumcision Services among Men in Turkana County (n = 370)

Variable	**Category**	**Percentage (%)**
Ever received VMMC services	Yes	66.8
	No	33.2
Have you been circumcised?	Yes	64.7
	No	35.3
Received circumcision	Yes	90.7
	No	9.3
Received counseling on VMMC	Yes	73.3
	No	26.7
Received HIV pre-test and post-test counseling	Yes	83.8
	No	16.2
Received health education on VMMC	Yes	88.7
	No	11.3
Post-circumcision follow-up	Yes	64.0
	No	36.0
Location of service received	Health facility	97.6
	Home/community	2.4
Experienced complications	Yes	47.1
	No	52.9
Types of complications experienced	Swelling	28.7
	Pain after circumcision	22.1
	Drug reaction	18.7

	Bleeding during and/or after circumcision	16.5
	Infection	13.6
	Convulsion	0.4
Complications managed	Yes	77.8
	No	22.2
Reasons for seeking VMMC services	To prevent HIV	26.6
	Hygiene purposes	25.9
	To know HIV status	18.0
	Encouraged by wife, colleagues, media	11.1
	Advised by health workers	11.1
	To seek medication for STIs	5.3

Source: Researcher (2023)

4.5 Bivariate Analysis of awareness factors for Voluntary Medical Male Circumcision services among men in Turkana County

The analysis revealed a high level of awareness of Voluntary Medical Male Circumcision (VMMC) services among the respondents, with 85.9% confirming prior knowledge of the intervention. Health facilities emerged as the leading source of information (38.5%), followed by friends (21.8%) and media (21.3%), indicating the significant role of both formal and informal communication channels in VMMC promotion.

Respondents' perceptions of the importance of VMMC services were dominated by preventive and hygienic motives. Specifically, 36.4% associated the service with HIV prevention, while 34.1% identified hygiene benefits. Other reported motivations included cultural and religious reasons, prestige, and perceived improvements in sexual performance.

Awareness of VMMC service locations was reported by 81.6% of respondents, with the vast majority (87.0%) identifying health facilities as the point of access. Similarly, 63.2% were knowledgeable about the appropriate age for circumcision. Adolescence was cited as the ideal circumcision period by 59.8% of the participants, reflecting prevailing perceptions of timely uptake.

Regarding potential concerns, only 17.3% believed VMMC reduced sexual pleasure, while 82.7% disagreed with this notion. Hygiene benefits were acknowledged by 74.3% of respondents, indicating good public understanding of the health value of circumcision.

On post-circumcision care, 38.8% reported daily wound dressing as the primary practice, followed by the intake of antibiotics and painkillers (31.7%), and special dietary measures (22.3%). Most respondents (43.8%) experienced full healing within four weeks, although 29.5% reported recovery periods exceeding four weeks. Notably, 65.1% received VMMC-related information from nearby health facilities, reaffirming their central role in health promotion.

These results, presented in Table 4.4, affirm that health facilities serve as crucial hubs for information dissemination and service delivery. The findings also suggest a generally positive awareness and understanding of VMMC among men in Turkana County, which could enhance continued uptake and compliance.

Table 4.6*:* Awareness Factors for Voluntary Medical Male Circumcision Services among Men in Turkana County (n = 370)

Variable	**Category**	**Percentage (%)**
Ever heard of VMMC	Yes	85.9
	No	14.1
Source of information	Health facility	38.5
	Friend	21.8
	Media	21.3
	Family member	18.4
Importance of VMMC	To prevent HIV	36.4
	For hygiene	34.1
	For cultural purposes	10.8
	For religious purposes	9.5
	To improve sex performance	5.3
	For prestige	3.9
Awareness of VMMC service locations	Yes	81.6
	No	18.4

VMMC service locations	Health facility	87.0
	Others (schools, mosques, outreach, etc.)	13.0
Awareness of circumcision age	Yes	63.2
	No	36.8
Appropriate circumcision age	Adolescence	59.8
	Baby/Child	17.1
	Early childhood	14.5
	Any age	8.1
	Late adulthood	0.4
Reduction in sex pleasure	No	82.7
	Yes	17.3
Awareness of hygiene benefits	Yes	74.3
	No	25.7
Post-circumcision care	Daily wound dressing	38.8
	Swallow antibiotics and painkillers daily	31.7
	Special diet	22.3
	Others	7.1
Healing duration	Within 4 weeks	43.8
	More than 4 weeks	29.5
	I don't know	26.8
Health facility information	Yes	65.1
	No	34.9

Source: Researcher (2023)

4.6 Bivariate Analysis of Accessibility factors for Voluntary Medical Male Circumcision services among men in Turkana County

This section presents the findings on key accessibility factors influencing the uptake of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County. The data highlights service availability, proximity, resource sufficiency, cost considerations, and perceived barriers to access.

As shown in Table 4.5, 71.3% of the respondents reported that VMMC services were available at health facilities within their respective sub-counties. This reflects a promising distribution of services at local levels. However, only 37.6% indicated that they lived within 5 kilometers of a health facility, suggesting that physical distance remains a potential limitation for a considerable portion of the population.

In terms of resource sufficiency, slightly more than half of the respondents (50.8%) acknowledged the availability of adequate materials required to support VMMC services, while the rest identified a lack of essential supplies as a concern. Despite these challenges, the financial aspect does not appear to pose a significant barrier, as 90.8% reported that VMMC services were offered free of charge. All individuals who incurred a cost (9.2%) paid Kshs. 500 and above.

Notably, only 17.6% of respondents reported facing healthcare system-related barriers to accessing VMMC services. This suggests that most individuals do not encounter institutional impediments, such as negative interactions with healthcare workers, that would discourage service utilization.

Table 4.7: Bivariate Analysis of Accessibility Factors for VMMC Services in Turkana County

Accessibility Factor	Response	Percentage (%)
VMMC Services in Sub-county Health Facilities	Yes	71.3
	No	28.7
Distance to Health Facility (<5 km)	Yes	37.6
	No	62.4
Availability of Materials	Yes	50.8
	No	49.2
Payment for VMMC Services	Yes	9.2
	No	90.8
Amount Paid	Kshs. 500 and above	100.0
	Not Applicable	0.0
Barriers to Access	Yes	17.6
	No	82.4

Source: Researcher (2023)

4.7 Bivariate Analysis of Social Cultural factors for uptake of Voluntary Medical Male Circumcision Services among men in Turkana County

The analysis delves into the social-cultural factors influencing the uptake of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County, as depicted in Table 4.6. Firstly, the table reveals that 60% of the study respondents acknowledged VMMC services as culturally accepted within their community. This finding suggests a significant level of social integration and acceptance of VMMC practices, which could positively impact the uptake of circumcision services among men in Turkana County.

Moreover, the data indicates that 60.54% of participants reported the existence of discrimination associated with circumcision. This finding highlights a concerning aspect of social dynamics surrounding VMMC, suggesting that discrimination based on circumcision status may act as a barrier to uptake or influence individuals' perceptions of circumcision within the community.

In terms of community perception towards circumcised individuals, the majority (55.95%) of respondents indicated that circumcised individuals were accepted in their community. This positive perception could potentially contribute to the normalization of circumcision and encourage more men to seek VMMC services.

Furthermore, the data reveals that the majority of participants (85.41%) stated that they did not need to seek permission from anyone to undergo circumcision. This finding indicates a level of autonomy and decision-making agency among individuals regarding their healthcare choices, which could facilitate easier access to VMMC services.

Regarding post-circumcision care, the responses varied, with 38.65% of participants indicating the need for a special diet after circumcision, while 47.84% reported no requirement for special dietary considerations. This highlights the importance of addressing misconceptions and providing accurate information regarding post-circumcision care to ensure optimal recovery and well-being among individuals undergoing the procedure.

Table 4.8: Bivariate Analysis of Social Cultural factors for uptake of Voluntary Medical Male in Turkana County

Variable	Frequency (N=370)	Percentage
Are VMMC Services culturally accepted in your community?		
Yes	222	60.00%
No	148	40.00%
Is there discrimination associated with circumcision?		
Yes	224	60.54%
No	146	39.46%
How are the circumcised individuals regarded in your community?		
Accepted	207	55.95%
Discouraged	163	44.05%
Do you need to seek permission from anyone to get circumcised?		
Yes	54	14.59%
No	316	85.41%
Does one require special diet after circumcision?		
Yes	143	38.65%
No	177	47.84%
I don't know	50	13.51%

Source: Field Data (2023)

The results presented in Table 4.2 underscore the complex interplay of social-cultural factors influencing the uptake of VMMC services in Turkana County. While there is a considerable level of cultural acceptance and community integration of VMMC practices, challenges such as discrimination and varying perceptions towards post-circumcision care exist and warrant attention in efforts to promote VMMC uptake and ensure comprehensive care for individuals undergoing the procedure.

4.7.1 Importance of VMMC for Cultural Purposes

The results from Table 4.7 shed light on the complex relationship between cultural significance and VMMC uptake in Turkana County. Interestingly, only 36.89% of men who viewed VMMC as important for cultural purposes actually opted for the procedure, with the majority (63.11%) not seeking VMMC services. This suggests that cultural reasons alone might not be a strong enough motivator for circumcision.

Further analysis of the odds ratio (cOR) strengthens this notion. The calculated cOR of 0.19 (95% CI: 0.12-0.31) with a highly statistically significant p-value (p-value < 0.001) indicates that men who considered VMMC culturally important were less likely to undergo the procedure compared to those who didn't view it as culturally significant (reference group).

These findings suggest that cultural factors might be acting as barriers to VMMC uptake in Turkana County. This underscores the importance of developing culturally sensitive and tailored interventions to address these barriers and promote VMMC services more effectively. Public health strategies should engage communities and consider their cultural beliefs when designing VMMC promotion programs.

Table 4.9: Importance of Voluntary Medical Male Circumcision (VMMC) services for cultural purposes and its association with VMMC uptake

Importance	VMMC Uptake	Yes (%)	No (%)	cOR (95% CI)	P-value
For cultural purposes	Yes	38 (36.89)	65 (63.11)	0.19 (0.12-0.31)	0.000**
	No	202 (75.66)	65 (24.34)	Ref	-

Source: Field Data (2023)

4.8 Analysis of Socio-demographic factors associated with uptake of Voluntary Medical Male Circumcision Services among men in Turkana County

4.8.1 Age as a Determinant of VMMC Uptake

The results in Table 4.8 present a comparison of Voluntary Medical Male Circumcision (VMMC) uptake across different age groups among men in Turkana County. The data indicates a significant association between age and VMMC uptake, as demonstrated by the calculated crude odds ratios (OR) and corresponding p-values.

Among individuals aged 20-29, there is a notable uptake of VMMC services, with 67.52% of participants in this age group reporting to have undergone circumcision. The calculated crude odds ratio (OR) for this age group compared to those above 50 years old is 3.47 (95% CI 1.45-8.27), indicating a strong association between being in the 20-29 age bracket and increased likelihood of VMMC uptake (p-value = 0.005**).

Similarly, individuals aged 30-39 also exhibit a high uptake of VMMC services, with 72.37% reporting circumcision. The crude odds ratio for this age group compared to those above 50 years old is even higher at 4.37 (95% CI 1.66-11.48), indicating a stronger association between being in the 30-39 age bracket and increased VMMC uptake (p-value = 0.003**).

Conversely, individuals aged 40-49 show a lower uptake of VMMC services, with only 50% reporting circumcision. However, the crude odds ratio for this age group compared to those above 50 years old is not statistically significant at 1.67 (95% CI 0.58-4.78), with a p-value of 0.342.

Table 4.10*:* Bivariate Analysis of Age and VMMC Uptake - Comparison of VMMC uptake across different age groups among men in Turkana County

Age Group	**VMMC Uptake (Yes)**	**VMMC Uptake (No)**	**Crude Odds Ratio (95% CI)**	**P-value**
20-29	158 (67.52%)	76 (32.48%)	3.47 (1.45-8.27)	0.005**
30-39	55 (72.37%)	21 (27.63%)	4.37 (1.66-11.48)	0.003**
40-49	18 (50.00%)	18 (50.00%)	1.67 (0.58-4.78)	0.342
Above 50	9 (37.50%)	15 (62.50%)	Reference	

Source: Field Data (2023)

These findings underscore the importance of age as a significant factor influencing VMMC uptake among men in Turkana County. Younger age groups, particularly those between 20-39 years old, demonstrate a significantly higher likelihood of accepting VMMC services compared to older age groups. This highlights the importance of targeted interventions and tailored messaging aimed at promoting VMMC uptake among younger men in the region.

4.8.2 Analysis of Sub county Variation in VMMC Uptake - Relationship between Sub County location and VMMC uptake among men in Turkana County

The results in Table 4.9 present a detailed analysis of the relationship between sub county location and the uptake of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County. Three sub counties are considered: Turkana North, Turkana South, and Turkana Central.

In Turkana North, the data indicates that 30 individuals out of the total sample population of 63 opted for VMMC, representing a VMMC uptake rate of 47.62%. Conversely, 33 individuals chose not to undergo circumcision, constituting 52.38% of the sample. The crude odds ratio (cOR) for VMMC uptake in Turkana North compared to Turkana Central, used as the reference, is 1.02, with a 95% confidence interval (CI) of 0.57-1.82. The p-value associated with this comparison is 0.939, indicating that the difference in VMMC uptake between Turkana North and Turkana Central is not statistically significant.

In Turkana South, the findings reveal a notably higher uptake of VMMC services, with 130 individuals (94.89%) opting for circumcision compared to only 7 individuals (5.11%) who did not. The calculated cOR for VMMC uptake in Turkana South compared to Turkana Central is remarkably high at 20.89, with a 95% CI of 9.22-47.34. Furthermore, the p-value associated with this comparison is <0.001, signifying a statistically significant association between residing in Turkana South and a higher likelihood of VMMC uptake compared to Turkana Central.

The reference category, Turkana Central was chosen as the reference category for comparison with the other sub-counties (Turkana North and Turkana South) due to several factors. First, its central location within Turkana County makes it a geographically neutral point of reference. Second, the VMMC uptake rate in Turkana Central (47.06%) falls approximately midway between the rates observed in Turkana North (47.62%) and Turkana South (94.89%). This central position allows for a more balanced comparison of the factors influencing uptake in the other sub-counties relative to a potentially representative average within the region.

Table 4.11*:* Bivariate Analysis of Sub county and VMMC Uptake - Relationship between sub county location and VMMC uptake among men in Turkana County

Sub-county	VMMC Uptake (Yes)	VMMC Uptake (No)	Crude Odds Ratio (95% CI)	P-value
Turkana North	30 (47.62%)	33 (52.38%)	1.02 (0.57-1.82)	0.939
Turkana South	130 (94.89%)	7 (5.11%)	20.89 (9.22-47.34)	0.000**
Turkana Central	80 (47.06%)	90 (52.94%)	Reference	

Source: Field Data (2023)

The analysis suggests substantial variation in VMMC uptake across different sub counties within Turkana County. While Turkana North exhibits a similar uptake rate to Turkana Central, Turkana South stands out with a significantly higher uptake rate, indicating potential differences in factors influencing VMMC uptake among these regions. These findings underscore the importance of considering sub county-level variations in designing targeted interventions aimed at improving VMMC uptake in Turkana County.

4.8.3 Analysis of Religion and VMMC Uptake

The results in Table 4.10 present the association between religion and the uptake of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County. According to the data, among individuals who identified as Christian, 69.67% opted for VMMC services, while 30.33% did not. Conversely, among those belonging to other religions (labeled as "Others"), 44.39% chose VMMC, while 55.71% did not.

The crude odds ratio (cOR) calculated for Christians compared to those of other religions was 2.89 (95% CI: 1.70-4.92), indicating that Christians were approximately 2.89 times more likely to uptake VMMC services compared to individuals of other religions. The p-value associated with this result was highly statistically significant ($p < 0.001$), suggesting a strong association between religion and VMMC uptake.

These findings underscore the influence of religious beliefs on the decision to undergo VMMC among men in Turkana County. The significantly higher uptake among Christians compared to individuals of other religions suggests that religious affiliation plays a pivotal role in shaping attitudes towards VMMC. This could be attributed to various factors such as cultural norms, religious teachings, and community perceptions regarding health practices.

The observed disparity in VMMC uptake between different religious groups highlights the importance of targeted interventions and culturally sensitive approaches in promoting VMMC awareness and acceptance. Understanding the influence of religion on healthcare decision-making is crucial for designing effective outreach programs and tailored messaging aimed at addressing specific community needs and preferences(Borges et al., 2021). Collaborative efforts involving religious leaders and community influencers may also facilitate the dissemination of accurate information and dispel misconceptions surrounding VMMC, ultimately contributing to increased uptake and positive health outcomes in the region.

Table 4.12*:* Bivariate Analysis of Religion and VMMC Uptake - Association between religion and VMMC uptake among men in Turkana County

Religion	**VMMC Uptake (Yes)**	**VMMC Uptake (No)**	**Crude Odds Ratio (95% CI)**	**P-value**
Christian	209 (69.67%)	91 (30.33%)	2.89 (1.70-4.92)	0.000**
Others	31 (44.39%)	39 (55.71%)	Reference	
Religion	VMMC Uptake (Yes)	VMMC Uptake (No)	Crude Odds Ratio (95% CI)	P-value

Source: Field Data (2023)

4.8.4 Analysis of Marital Status and VMMC Uptake among Men in Turkana County

The results in Table 4.11 present the bivariate analysis examining the correlation between marital status and the uptake of Voluntary Medical Male Circumcision (VMMC) among men in Turkana County. The table reveals that among married individuals, 116 out of 172 respondents (67.44%) reported having undergone VMMC, whereas 56 individuals (32.56%) did not opt for circumcision. Conversely, among single individuals, 124 out of 198 respondents (62.63%) chose to undergo VMMC, while 74 individuals (37.37%) did not.

The calculated crude odds ratio (cOR) for VMMC uptake among married individuals compared to single individuals was 1.24, with a 95% confidence interval (CI) ranging from 0.804 to 1.9. However, the p-value associated with this analysis was 0.333, indicating no statistically significant association between marital status and VMMC uptake among men in Turkana County.

Despite the lack of statistical significance, it's noteworthy that there is a slightly higher proportion of married individuals who underwent VMMC compared to single individuals. However, the difference is not substantial enough to establish a significant correlation between marital status and VMMC uptake.

Table 4.13*:* Bivariate Analysis of Marital Status and VMMC Uptake - Correlation between marital status and VMMC uptake among men in Turkana County

Marital Status	**VMMC Uptake (Yes)**	**VMMC Uptake (No)**	**Crude Odds Ratio (95% CI)**	**P-value**
Married	116 (67.44%)	56 (32.56%)	1.24 (0.804-1.9)	0.333
Single	124 (62.63%)	74 (37.37%)	Reference	
Marital Status	VMMC Uptake (Yes)	VMMC Uptake (No)	Crude Odds Ratio (95% CI)	P-value

Source: Field Data (2023)

4.8.5 Analysis of Education Level and VMMC Uptake

The results in Table 4.12 present a significant association between education level and the uptake of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County. The data indicate that individuals with higher levels of education are more likely to undergo VMMC compared to those with lower levels or no formal education.

Among respondents with primary education, 84.62% had undergone VMMC, demonstrating a notable uptake. This proportion significantly increased with higher levels of education, with 91.74% of those with secondary education and 90.16% of those with tertiary education reporting VMMC uptake. These figures are substantially higher compared to individuals with no formal education, where only 22.06% had undergone VMMC.

The calculated crude odds ratios (ORs) further emphasize the strong association between education level and VMMC uptake. The ORs for secondary and tertiary education compared to no formal education are particularly noteworthy, with values of 39.2 and 32.4, respectively. These values indicate a substantially higher likelihood of VMMC uptake among individuals with secondary or tertiary education compared to those with no formal education.

The p-values associated with each education level are highly significant ($p < 0.001$), indicating a strong statistical significance in the association between education level and VMMC uptake.

This suggests that the observed differences in VMMC uptake across different education levels are unlikely to have occurred by chance alone.

Table 4.14*:* Bivariate Analysis of Education Level and VMMC Uptake – Relationship between education level and VMMC uptake among men in Turkana County

Education Level	VMMC Uptake (Yes)	VMMC Uptake (No)	Crude Odds Ratio (95% CI)	P-value
Primary Education	44 (84.62%)	8 (15.38%)	19.4 (8.26-45.7)	0.000**
Secondary Education	111 (91.74%)	10 (8.26%)	39.2 (18.3-84.16)	0.000**
Tertiary Education	55 (90.16%)	6 (9.84%)	32.4 (12.7-82.5)	0.000*
No formal Education	30 (22.06%)	106 (77.94%)	Reference	

Source: Field Data (2023)

These findings underscore the importance of education in influencing the uptake of VMMC services. Higher levels of education may be associated with increased awareness, understanding of the health benefits of VMMC, and possibly better access to healthcare services, all of which contribute to the higher uptake observed among individuals with secondary or tertiary education compared to those with lower levels or no formal education.

4.8.6 Analysis of Type of House and VMMC Uptake

The results in Table 4.13 present the relationship between the type of house and the uptake of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County. The analysis reveals that among individuals living in permanent houses, 87.63% opted for VMMC, while only 12.37% did not. In contrast, among those residing in temporary houses, the uptake of VMMC was notably lower, with only 41.85% choosing the service, while 58.15% did not.

The crude odds ratio (OR) indicates a substantial association between the type of house and VMMC uptake. Specifically, individuals living in permanent houses were nearly ten times more likely to opt for VMMC compared to those living in temporary houses. The calculated

OR of 9.8 suggests a strong positive correlation between residing in a permanent house and choosing to undergo circumcision.

Furthermore, the p-value associated with this analysis is highly significant ($p < 0.001$), indicating that the observed association between the type of house and VMMC uptake is unlikely to be due to random chance alone. This underscores the robustness of the relationship between housing type and the decision to undergo VMMC.

The findings suggest that individuals living in permanent houses are more inclined to avail themselves of VMMC services compared to those living in temporary dwellings. This could be attributed to various factors, including differences in socioeconomic status, access to healthcare information, or cultural beliefs. Understanding these dynamics can inform targeted interventions aimed at increasing VMMC uptake among specific demographic groups within Turkana County.

Table 4.15*:* Bivariate Analysis of Type of House and VMMC Uptake – Relationship between type of house and VMMC uptake among men in Turkana County

Type of House	VMMC Uptake (Yes)	VMMC Uptake (No)	Crude Odds Ratio (95% CI)	P-value
Permanent	163 (87.63%)	23 (12.37%)	9.8 (5.82-16.66)	0.000**
Temporary	77 (41.85%)	107 (58.15%)	Reference	

Source: Field Data (2023)

4.8.7 Distance to VMMC Services and Circumcision Uptake in Turkana County

The results in Table 4.14 present a significant association between the distance to the nearest Voluntary Medical Male Circumcision (VMMC) center and the uptake of VMMC services among men in Turkana County. Among individuals residing within 5 kilometers of a VMMC center, 113 out of 229 participants (49.34%) opted for VMMC, whereas 127 out of 141 participants (90.07%) residing more than 5 kilometers away chose to undergo circumcision. The crude odds ratio (OR) for VMMC uptake among those living within 5 kilometers is 9.31 (95% CI: 5.06-17.13), indicating a substantially higher likelihood of uptake compared to those living farther away.

This finding suggests that proximity to VMMC facilities plays a crucial role in the decision-making process for circumcision uptake. Men living within a closer radius to VMMC centers may find it more convenient and accessible to access these services, leading to a higher uptake

rate. Conversely, individuals residing farther away may face logistical challenges or barriers in accessing VMMC centers, resulting in a lower uptake rate.

The statistically significant p-value ($p < 0.001$) further supports the observed association, indicating that the relationship between distance to the nearest VMMC center and uptake of VMMC services is unlikely to be due to random chance. This underscores the importance of strategically locating VMMC centers within communities to enhance accessibility and improve uptake rates, especially among populations residing in remote or underserved areas.

Efforts to increase the availability of VMMC services closer to where men live could help bridge the gap in uptake disparities based on geographical location. Mobile VMMC clinics or outreach programs targeting areas with limited access to healthcare facilities may also be beneficial in reaching individuals who reside beyond a reasonable distance from fixed VMMC centers. Addressing distance-related barriers can contribute significantly to increasing the uptake of VMMC services and achieving public health goals related to HIV prevention and male reproductive health in Turkana County.

Table 4.16*:* Correlation between distance to nearest VMMC Centre and VMMC uptake among men in Turkana County

Distance to Nearest VMMC Centre	**VMMC Uptake (Yes)**	**VMMC Uptake (No)**	**Crude Odds Ratio (95% CI)**	**P-value**
Within 5 km	113 (49.34%)	116 (50.66%)	9.31 (5.06-17.13)	0.000**
More than 5 kms	127 (90.07%)	14 (35.14%)	Reference	

Source: Field Data (2023)

4.9 Influence of Accessibility on VMMC Uptake among men in Turkana County

4.9.1 Analysis of VMMC Uptake and Services Received

Table 4.15 examines the association between VMMC service uptake and circumcision among men in Turkana County. Interestingly, a vast majority (96.36%) of those who received VMMC services opted for circumcision, with only a small percentage (3.64%) not undergoing the procedure. This stark contrast suggests a strong preference for circumcision within the context of VMMC service utilization.

The calculated crude odds ratio (cOR) of 1599.9 (95% CI: 340.4-7520.7) further strengthens this association. This high cOR indicates that individuals who received circumcision services were overwhelmingly more likely to have sought VMMC services compared to those who did not (1.63% received circumcision without VMMC services). This statistically significant association (p-value likely <0.001) highlights circumcision as a key driver for VMMC service uptake in Turkana County.

Table 4.17*:* Association between VMMC Uptake and Services Received

VMMC Uptake	Yes (%)	No (%)	cOR (95% CI)	P-value
Yes	238 (96.36)	9 (3.64)	1599.9 (340.4-7520.7)	<0.001**
No	2 (1.63)	121 (98.37)	Ref	

Source: Field Data (2023)

4.9.2 Association between Services Received and Circumcision

Table 4.16 explores the link between receiving various VMMC services and undergoing circumcision. While some services show a connection to circumcision, the strength of that connection varies.

Counselling on VMMC: A majority (95.58%) of those who received counselling opted for circumcision, compared to 98.48% who didn't receive counselling. However, the calculated odds ratio (cOR) of 0.33 and a non-significant p-value (0.304) indicate a weak and statistically insignificant association between receiving counselling and circumcision itself.

Circumcision itself: Here, a clear association emerges. Among those who were circumcised, a vast majority (99.11%) received VMMC services, compared to only 69.57% of those who weren't circumcised. This substantial difference is further supported by the high cOR of 48.6 (p-value < 0.001), signifying a strong and statistically significant positive association. This suggests that individuals who undergo circumcision are overwhelmingly more likely to have sought VMMC services.

Post-circumcision follow-up: Interestingly, 100% of those who received post-circumcision follow-up were in the VMMC uptake group, compared to 89.89% who didn't receive follow-up. While the cOR isn't provided, the perfect uptake rate among those receiving follow-up suggests a potential association.

Health education on VMMC: Similar to post-circumcision follow-up, 95.89% of individuals who received health education opted for VMMC services, compared to none who didn't receive education. While the cOR and p-value are missing, the data implies a clear association between VMMC health education and circumcision uptake.

Table 4.18*:* Association between other Services Received and VMMC

Services Received	**VMMC Uptake: Yes (%)**	**VMMC Uptake: No (%)**	**cOR (95% CI)**	**P-value**
Counselling on VMMC	Yes: 173 (95.58)	No: 65 (98.48)	0.33 (0.041-2.71)	0.304
Post-Circumcision Follow-up	Yes: 158 (100)	No: 80 (89.89)	1	
Health Education on VMMC	Yes: 210 (95.89)	No: 28 (100)	1	

Source: Field Data (2023)

4.9.3 Association between Services Received and Reasons for Seeking VMMC

Building on the findings in Table 4.16 above, which highlighted circumcision as the primary outcome of VMMC services, Table 4.17 delves into the association between specific VMMC services and the reasons men seek circumcision.

Interestingly, receiving counselling on VMMC doesn't show a strong influence on the decision to undergo circumcision. While a slightly higher proportion of those who received counselling opted for VMMC (95.58% vs. 98.48%), the cOR of 0.33 and non-significant p-value (0.304) indicate a weak and statistically insignificant association. This suggests that counselling may be a standard procedure, not necessarily a deciding factor for circumcision itself.

In contrast, circumcision itself is a strong driver for VMMC uptake. A vast majority (99.11%) of those circumcised received VMMC services, compared to only 69.57% who were not. This substantial difference is further supported by the high cOR of 48.6 (p-value < 0.001), signifying a strong and statistically significant positive association. This reinforces the conclusion from Table 4.17 - VMMC services are primarily sought for circumcision.

The analysis of post-circumcision follow-up and health education on VMMC presents a different picture. Both services boast high uptake rates (100% and 95.89% respectively) among those who received VMMC services. However, the cORs of 1 for both services indicate no

significant association between receiving these services and the initial decision to seek VMMC. This suggests that while crucial for post-operative care and education, these services may not directly influence the initial motivation for VMMC uptake.

In essence, Table 4.17 complements the findings of Table 4.16 by examining the reasons behind VMMC uptake. While counselling, follow-up, and education are all important aspects of VMMC programs, circumcision itself emerges as the primary driver for men seeking VMMC services in Turkana County.

Table 4.19*:* Association between Services Received and Reasons for Seeking VMMC

Services Received	**VMMC Uptake: Yes (%)**	**VMMC Uptake: No (%)**	**cOR (95% CI)**	**P-value**
Counselling on VMMC	Yes: 173 (95.58)	No: 65 (98.48)	0.33 (0.041-2.71)	0.304
Circumcision	Yes: 222 (99.11)	No: 16 (69.57)	48.6 (9.31-253.2)	<0.001**
Post-Circumcision Follow-up	Yes: 158 (100)	No: 80 (89.89)	1	
Health Education on VMMC	Yes: 210 (95.89)	No: 28 (100)	1	

Source: Field Data (2023)

4.9.4 Association between Location of Service and VMMC Uptake

Table 4.19 presents an analysis of the association between the location of service and the uptake of Voluntary Medical Male Circumcision (VMMC) among men in Turkana County. The table highlights two primary locations where VMMC services are received: health facilities and home/community settings.

The data shows that the vast majority of VMMC uptake occurs at health facilities, with 97.93% of participants indicating they received VMMC services in this setting. In contrast, only a negligible proportion of participants (2 out of 238) reported receiving VMMC outside of health facilities, specifically in home or community settings. This significant disparity in uptake

between health facilities and other locations underscores the central role that formal healthcare institutions play in delivering VMMC services in Turkana County.

The crude odds ratio (cOR) further elucidates the strength of association between the location of service and VMMC uptake. The calculated cOR of 94.4 (95% CI: 13.92-640.4) indicates a substantial positive association between receiving VMMC services at health facilities and uptake among men in Turkana County. This finding suggests that individuals who seek VMMC services at health facilities are overwhelmingly more likely to undergo circumcision compared to those who receive services elsewhere.

The p-value, which is less than 0.001, indicates that this association is statistically significant. This underscores the importance of health facility-based delivery of VMMC services as an effective strategy for increasing uptake among men in Turkana County.

In contrast, the reference category for comparison, which represents VMMC uptake in home or community settings, shows a lower uptake rate (33.33%). However, this comparison may not be directly comparable due to the significantly lower number of respondents who reported receiving VMMC outside of health facilities.

Table 4.20*:* Association between Location of Service and VMMC Uptake

Location	**VMMC Uptake: Yes (%)**	**VMMC Uptake: No (%)**	**cOR (95% CI)**	**P-value**
Health Facility	Yes: 236 (97.93)	No: 2 (33.33)	94.4 (13.92-640.4)	<0.001**
Home/Community	2 (33.33)	4 (66.67)	Ref	

Source: Field Data (2023)

4.9.5 Association Between Reasons for Seeking VMMC and Uptake

Table 4.19 sheds light on the various reasons men in Turkana County seek Voluntary Medical Male Circumcision (VMMC) services and how these motivations influence uptake.

A key takeaway is the strong association between HIV prevention and VMMC uptake. Individuals seeking VMMC primarily to prevent HIV transmission have a significantly higher uptake rate (97.18%) compared to those who don't prioritize this reason (84.62%). This association is further supported by a high odds ratio (cOR) of 6.3 (p-value = 0.002). Similarly,

those seeking to know their HIV status through VMMC also demonstrate a strong association with uptake (99.31% vs. 89.81%), with a significant cOR of 16 (p-value = 0.008).

The data also reveals the influence of social circles and media on VMMC uptake. Men encouraged by wives, colleagues, or media exhibited a perfect uptake rate (100%), highlighting the potential impact of social pressure and information dissemination.

However, motivations related to treating sexually transmitted infections (STIs) showed a weaker association. While uptake remains high among those seeking VMMC for STI medication (98.10%), the association with those not seeking it for this reason (93.20%) is not statistically significant (p-value = 0.092). This suggests STI treatment might be a secondary consideration for some when deciding on VMMC.

Finally, hygiene emerges as another significant motivating factor. Individuals seeking VMMC primarily for hygiene reasons have a much higher uptake rate (97.58%) compared to those who don't (84.44%). The cOR of 7.44 (p-value = 0.001) further reinforces this association, highlighting the importance of hygiene considerations in VMMC decision-making for some men in Turkana County.

Table 4.21*:* Association Between Reasons for Seeking VMMC, Uptake, and Other Factors

Reason for Seeking VMMC	**Other Factor**	**VMMC Uptake: Yes (%)**	**VMMC Uptake: No (%)**	**cOR (95% CI)**	**P-value**
To know my HIV Status	-	Yes: 143 (99.31)	No: 97 (89.81)	16 (2.06-127.7)	0.008**
To Prevent HIV	-	Yes: 207 (97.18)	No: 33 (84.62)	6.3 (1.91-20.6)	0.002**
Encouraged by Wife, Colleagues, Media	-	Yes: 42 (100)	No: 198 (94.29)	1	
To seek medication for STIs	Yes	Yes: 103 (98.10)	No: 137 (93.20)	3.76 (0.81-17.5)	0.092*
Hygiene Purposes	Yes	Yes: 202 (97.58)	No: 38 (84.44)	7.44 (2.24-24.68)	0.001**

Source: Field Data (2023)

4.10 Influence of Awareness on Uptake of Voluntary Medical Male Circumcision Services among men in Turkana County

4.10.1 Awareness and Uptake of VMMC

The results presented in Table 4.20 reveal a clear link between awareness of Voluntary Medical Male Circumcision (VMMC) and its uptake among men in Turkana County. A significant majority (74.84%) of those aware of VMMC services reported having undergone the procedure, compared to a very low uptake rate (3.85%) among those unaware of VMMC.

This strong association is further confirmed by the high crude odds ratio (cOR) of 74.4 (95% CI: 17.7-312.62). This value indicates that men aware of VMMC are roughly 74.4 times more likely to have utilized these services compared to those who were not aware. The statistically significant p-value of less than 0.001 further reinforces the validity of this finding.

In simpler terms, awareness of VMMC is a critical factor influencing uptake. Men with knowledge of VMMC are substantially more likely to undergo the procedure, highlighting the importance of awareness campaigns in promoting VMMC services within Turkana County.

Table 4.22*:* Awareness of VMMC among men in Turkana County and its association with VMMC uptake

VMMC Uptake	Yes (%)	No (%)	cOR (95% CI)	P-value
Yes	238 (74.84)	80 (25.16)	74.4 (17.7-312.62)	<0.001**
No	2 (3.85)	50 (96.15)	Ref	-

Source: Field Data (2023)

4.10.2 Importance of VMMC for HIV Prevention

The results presented in Table 4.21 explore the association between perceiving VMMC as an HIV prevention method and VMMC uptake among men in Turkana County. While a trend emerges, the statistical significance remains unclear.

Among those who believe VMMC helps prevent HIV, 65.61% opted for the procedure, compared to 54.17% of those who didn't view it as essential for HIV prevention. This suggests a potential link between recognizing the HIV prevention benefit and choosing VMMC services. However, the calculated odds ratio (cOR) of 1.61 (p-value = 0.26) indicates that this association is not statistically significant at the conventional level (often $p < 0.05$).

This finding suggests two possibilities. There might be a genuine trend towards higher uptake among those who recognize the HIV prevention benefit, but a larger sample size might be

needed to confirm statistical significance. Alternatively, other factors besides HIV prevention might play a more significant role in VMMC uptake decisions in this population. Further investigation might be necessary to gain a clearer understanding of this relationship.

Table 4.23*:* Importance of Voluntary Medical Male Circumcision (VMMC) services for HIV prevention and its association with VMMC uptake

Importance	**VMMC Uptake**	**Yes (%)**	**No (%)**	**cOR (95% CI)**	**P-value**
To prevent HIV	Yes	227 (65.61)	119 (34.39)	1.61 (0.702-3.713)	0.26
	No	13 (54.17)	11 (45.83)	Ref	-

Source: Field Data (2023)

4.10.3 Importance of VMMC for Hygiene

The results from Table 4.22 highlight the importance of hygiene as a motivating factor for VMMC uptake in Turkana County.

Over two-thirds (66.87%) of participants who acknowledged the hygienic benefits of VMMC services opted for circumcision, compared to only half (50%) of those who did not consider hygiene important. This translates to a statistically significant association (p-value = 0.03) with a crude odds ratio (cOR) of 2.02. In simpler terms, men who recognize the hygiene benefits of VMMC are more than twice as likely to undergo circumcision compared to those who don't.

These findings underscore the importance of hygiene-related motivations in influencing VMMC uptake. This suggests that educational and awareness campaigns emphasizing the hygienic benefits of VMMC could be a valuable tool for promoting VMMC services in Turkana County.

Table 4.24*:* Importance of Voluntary Medical Male Circumcision (VMMC) services for hygiene and its association with VMMC uptake

Importance	**VMMC Uptake**	**Yes (%)**	**No (%)**	**cOR (95% CI)**	**P-value**
For hygiene	Yes	218 (66.87)	108 (33.13)	2.02 (1.1-3.8)	0.03**

No	22 (50)	22 (50)	Ref	-

Source: Field Data (2023)

4.10.4 Importance of VMMC for Prestige

The results exploring the association between perceived prestige and VMMC uptake in Turkana County are presented in Table 4.23. Here, we see that 74% of men who viewed VMMC as enhancing prestige opted for the procedure, compared to 63.44% of those who did not see a prestige association. While this suggests a slight tendency for prestige-motivated individuals to have higher uptake, the calculated odds ratio (cOR) of 1.64 (95% CI: 0.84-3.21) indicates this association is not statistically significant (p-value = 0.149).

In simpler terms, there might be a weak link between perceiving VMMC as prestigious and actually undergoing the procedure. However, this link is not strong enough to be considered statistically relevant at the conventional 5% significance level. This suggests that other factors likely play a more substantial role in influencing VMMC uptake decisions among men in Turkana County.

Table 4.25*:* Importance of Voluntary Medical Male Circumcision (VMMC) services for prestige and its association with VMMC uptake

Importance	**VMMC Uptake**	**Yes (%)**	**No (%)**	**cOR (95% CI)**	**P-value**
For Prestige	Yes	37 (74)	13 (26)	1.64 (0.84-3.21)	0.149*
	No	203 (63.44)	117 (36.56)	Ref	-

Source: Field Data (2023)

4.10.5 Awareness of VMMC Service Accessibility

The results presented in Table 4.24 highlight a critical link between awareness of Voluntary Medical Male Circumcision (VMMC) service locations and VMMC uptake among men in Turkana County. A substantial proportion (78.15%) of those who had ever heard of VMMC knew where to access the services. This awareness translates to greater healthcare accessibility, as those informed about service locations are more likely to utilize VMMC.

Conversely, a mere 5.88% of respondents who had never heard of VMMC were aware of where to obtain it. This stark disparity underscores the crucial role of awareness campaigns and health education initiatives. Without adequate knowledge of VMMC service locations, men may face significant barriers to accessing and ultimately utilizing these services.

The calculated crude odds ratio (cOR) of 57.2 (95% CI 20.1-162.9) further strengthens the association. This high cOR indicates that men aware of VMMC service locations are significantly more likely to undergo the procedure compared to those who are not. The statistically significant p-value of less than 0.001 reinforces this connection. This statistical significance emphasizes the importance of targeted interventions that improve awareness and knowledge dissemination regarding VMMC service availability. By facilitating better understanding of where to access VMMC, these interventions have the potential to significantly increase uptake rates among men in Turkana County.

Table 4.26: Awareness of where to get VMMC services and its association with VMMC uptake

VMMC Uptake	Yes (%)	No (%)	cOR (95% CI)	P-value
Yes	236 (78.15)	66 (21.85)	57.2 (20.1-162.9)	<0.001**
No	4 (5.88)	64 (94.12)	Ref	-

Source: Field Data (2023)

4.10.6 Awareness of Appropriate Circumcision Age

The results from Table 4.25 shed light on the crucial role of awareness regarding the recommended age for circumcision in driving VMMC uptake in Turkana County. A significant majority (91.45%) of men who had undergone VMMC were aware of the appropriate age for the procedure. Conversely, a small proportion (8.55%) lacked this knowledge. This stark difference translates to a strong association between awareness and VMMC uptake.

The calculated crude odds ratio (cOR) of 45.3 further emphasizes this connection. Individuals aware of the recommended age were 45.3 times more likely to have undergone VMMC compared to those who were unaware. The narrow 95% confidence interval (24.19-84.71) reinforces the consistency of this association. Additionally, the highly significant p-value (less than 0.001) statistically validates this observed relationship.

These findings highlight the importance of disseminating accurate information about the appropriate age for circumcision. Men equipped with this knowledge are more likely to seek VMMC services, potentially leading to higher circumcision coverage and associated health benefits, particularly in preventing HIV and other sexually transmitted infections.

Therefore, Table 4.25 underscores the need for effective awareness campaigns and educational initiatives. By ensuring men in Turkana County are well-informed about the optimal timing for circumcision, health authorities and stakeholders can significantly enhance VMMC uptake and promote circumcision as a key preventive health measure.

Table 4.27: Awareness of the Age for Circumcision - Awareness of the age at which males should be circumcised and its association with VMMC uptake

VMMC Uptake	Yes (%)	No (%)	cOR (95% CI)	P-value
Yes	214 (91.45)	20 (8.55)	45.3 (24.19-84.71)	<0.001**
No	26 (19.12)	110 (80.88)	Ref	-

Source: Field Data (2023)

4.10.7 Knowledge of Hygiene Benefits

The results presented in Table 4.26 explore the link between knowledge of hygiene benefits associated with Voluntary Medical Male Circumcision (VMMC) and VMMC uptake among men in Turkana County.

A striking finding is the significant difference in hygiene benefit awareness between those who received VMMC and those who didn't. A large majority (85.82%) of men who underwent VMMC were aware of the hygiene advantages, compared to a very small percentage (4.21%) of those who did not adopt VMMC. This suggests a potential association between knowledge of hygiene benefits and the decision to be circumcised.

This association is further strengthened by the calculated crude odds ratio (cOR) of 137.7 (95% CI: 47.84-396.19). This high cOR, along with a highly significant p-value (less than 0.001), indicates a strong positive association between hygiene benefit awareness and VMMC uptake. In simpler terms, men who are aware of the hygiene benefits of VMMC are significantly more likely to undergo the procedure.

This finding likely reflects a better understanding of the overall health benefits associated with VMMC. Knowledge of advantages like reduced risk of infections and improved genital hygiene might be motivating factors for men to choose VMMC. Consequently, implementing targeted educational interventions that emphasize these hygiene benefits could be a valuable strategy to increase VMMC uptake rates in Turkana County.

Table 4.28: Knowledge of hygiene benefits of VMMC services and its association with VMMC uptake

VMMC Uptake	Yes (%)	No (%)	cOR (95% CI)	P-value
Yes	236 (85.82)	39 (14.18)	137.7 (47.84-396.19)	<0.001**
No	4 (4.21)	91 (95.79)	Ref	-

Source: Field Data (2023)

4.10.8 Receipt of VMMC Information from Health Facilities

The results from Table 4.27 shed light on the significant association between receiving Voluntary Medical Male Circumcision (VMMC) information from nearby health facilities and VMMC uptake among men in Turkana County. A substantial majority (87.55%) of those who received VMMC information from these facilities opted to undergo circumcision, compared to a much lower rate (22.48%) among those who did not receive such information.

This strong positive association is further confirmed by the high crude odds ratio (cOR) of 24.3 (95% CI: 13.81-42.6) and a highly significant p-value of less than 0.001. This p-value indicates the observed association is unlikely due to chance alone.

These findings highlight the crucial role health facilities play in influencing VMMC decisions. By serving as key sources of information and education, they can significantly increase awareness and potentially enhance the acceptability and uptake of circumcision among men in Turkana County. Men who receive VMMC information directly from healthcare providers are demonstrably more likely to undergo the procedure.

This underscores the importance of targeted information dissemination strategies through health facilities. Investing in healthcare provider training and encouraging them to actively promote VMMC services can significantly contribute to increased uptake rates.

Table 4.29: Receipt of VMMC information from nearby health facility and its association with VMMC uptake

VMMC Uptake	Yes (%)	No (%)	cOR (95% CI)	P-value
Yes	211 (87.55)	30 (12.45)	24.3 (13.81-42.6)	<0.001**

No	29 (22.48)	100 (77.52)	Ref	-

Source: Field Data (2023)

The results underscore the importance of targeted information dissemination strategies through health facilities in promoting VMMC uptake, highlighting the pivotal role of healthcare providers in facilitating informed decision-making regarding male circumcision.

4.11 The Impact of Accessibility of Male Circumcision Facilities on VMMC Uptake in Turkana County

4.11.1 The Impact of VMMC Services Availability in Sub County Health Facilities

The results presented in Table 4.28 offer compelling evidence regarding the impact of VMMC service availability in sub-county health facilities on circumcision uptake among men in Turkana County. There's a clear disparity in uptake rates based on accessibility.

In areas where VMMC services are offered within sub-county facilities, a significantly higher proportion of men (87.5%) opt for circumcision compared to those without such access (8.49%). This vast difference translates to a high crude odds ratio (cOR) of 75.4 (95% CI: 34.78-163.64). This statistic indicates that men residing near VMMC-equipped sub-county facilities are over 75 times more likely to undergo circumcision compared to those without local access.

Furthermore, the statistically significant p-value of less than 0.001 reinforces the strength of this association. It suggests a true relationship between service availability and circumcision uptake, not merely a random finding.

These findings highlight the critical role of VMMC service accessibility within sub-county health facilities. Expanding VMMC services to these facilities holds significant potential as a strategy to increase circumcision rates. This, in turn, could contribute to broader public health initiatives aimed at reducing HIV/AIDS and sexually transmitted infections (STIs) in Turkana County.

Table 4.30: Association between VMMC services offered in health facilities in the Sub County and uptake of VMMC among men in Turkana County

VMMC Uptake	Yes (%)	No (%)	cOR (95% CI)	P-value
Yes	231 (87.5)	33 (12.5)	75.4 (34.78-163.64)	0.000**

No	9 (8.49)	97 (91.51)	Ref	-

Source: Field Data (2023)

4.11.2 The Impact of Proximity to Health Facilities on VMMC Uptake

The results from Table 4.29 shed light on the significant impact of proximity to health facilities on VMMC uptake among men in Turkana County. A clear disparity emerges when examining VMMC rates based on distance to the nearest health facility.

Individuals residing within 5 kilometers of a health facility demonstrate a substantially higher uptake rate. A staggering 90.65% (126 individuals) underwent VMMC compared to only 9.35% (13 individuals) who did not. This translates to a crude odds ratio (cOR) of 9.95 (95% CI 5.32-18.6). This high cOR signifies a near tenfold increase in the likelihood of undergoing circumcision for those living closer to healthcare facilities. The statistically significant p-value of 0.000 further reinforces this strong positive association.

Conversely, men residing further than 5 kilometers from a health facility exhibit a considerably lower uptake rate. Here, only 49.35% (114 individuals) opted for VMMC, while the remaining 50.65% (117 individuals) did not.

These findings highlight the critical role of geographical accessibility in influencing VMMC uptake. When healthcare facilities are readily available within a 5-kilometer radius, men are significantly more likely to access and utilize VMMC services. This underscores the importance of strategically expanding healthcare infrastructure or implementing mobile VMMC clinics, particularly in remote areas, to bridge geographical gaps and ensure equitable access to VMMC for all men in Turkana County.

Table 4.31: Association between the distance between home and health facility and uptake of VMMC among men in Turkana County

VMMC Uptake	**Yes (%)**	**No (%)**	**cOR (95% CI)**	**P-value**
Within 5 kms	126 (90.65)	13 (9.35)	9.95 (5.32-18.6)	0.000**
More than 5 kms	114 (49.35)	117 (50.65)	Ref	-

Source: Field Data (2023)

4.11.3 The Impact of Availability of Materials in Health Facilities on VMMC Uptake

The results presented in Table 4.30 paint a clear picture: the availability of materials in health facilities has a significant impact on VMMC uptake among men in Turkana County. Men who

reported access to facilities with sufficient materials for VMMC services were much more likely to undergo the procedure. A staggering 92.02% (173 out of 188) of men in this group opted for VMMC, compared to a mere 36.81% (67 out of 182) who reported a lack of materials in their local facilities.

This stark difference is further emphasized by the calculated odds ratio (cOR) of 19.8 (95% CI: 10.78-36.34) and a highly significant p-value of less than 0.001. This indicates a strong positive association between having access to necessary materials and the likelihood of men choosing VMMC services.

In contrast, the reference group comprised men who reported a lack of materials. Their odds of opting for VMMC were considerably lower, reflected by a cOR of 1 (the reference point) and the absence of a confidence interval. This reinforces the notion that limited materials in facilities create a significant barrier to VMMC uptake.

These findings highlight the critical role of ensuring adequate supplies in health facilities. Access to essential materials not only allows healthcare providers to effectively perform VMMC procedures but also fosters trust and confidence within the community. When facilities are well-equipped, it signifies a commitment to quality healthcare, potentially leading to increased utilization of all healthcare services, not just VMMC.

Table 4.32: Association between the availability of materials for healthcare services in health facilities and uptake of VMMC among men in Turkana County

VMMC Uptake	Yes (%)	No (%)	cOR (95% CI)	P-value
Yes	173 (92.02)	15 (7.89)	19.8 (10.78-36.34)	0.000**
No	67 (36.81)	115 (63.19)	Ref	-

Source: Field Data (2023)

4.11.4 The Impact of Healthcare Worker Barriers on VMMC Uptake

The results from Table 4.31 present a counterintuitive finding regarding the association between healthcare worker barriers and VMMC uptake in Turkana County. Contrary to expectations, men who reported facing barriers related to healthcare workers when accessing VMMC services exhibited a higher uptake rate (81.54%) compared to those who encountered no such barriers (61.31%).

This seemingly contradictory result can be interpreted in a few ways. It's possible that men who faced challenges from healthcare workers might have been more motivated to overcome these

hurdles and ultimately undergo VMMC. This determination could stem from a strong personal desire for the health benefits associated with circumcision, such as HIV prevention.

Alternatively, the data might reflect underlying issues within the healthcare system that discourage some men from seeking VMMC altogether. Perhaps those who reported no barriers encountered a more welcoming and efficient service delivery process, leading to a lower uptake rate due to less perceived urgency or need.

To gain a clearer understanding, further investigation is needed. Qualitative studies exploring the specific experiences of men who faced healthcare worker barriers could shed light on their motivations for pursuing VMMC despite the challenges. Additionally, examining the nature of the reported barriers themselves might reveal areas for improvement within the healthcare system to ensure a more streamlined and accessible VMMC service experience for all men in Turkana County.

To further quantify the strength of this association, the table provides the crude odds ratio (cOR) with a 95% confidence interval (CI). The calculated cOR of 2.79 indicates that individuals facing barriers related to healthcare workers have approximately 2.79 times higher odds of utilizing VMMC services compared to those who do not encounter such barriers. Moreover, the 95% CI ranges from 1.43 to 5.43, indicating a significant association between the presence of barriers related to healthcare workers and increased VMMC uptake.

The statistical significance of this association is underscored by the provided p-value. The obtained p-value of 0.003** signifies that the association between barriers related to healthcare workers and VMMC uptake is statistically significant at a high level of significance ($p < 0.01$), indicating strong evidence against the null hypothesis.

Table 4.33: Association between Barriers Related to Healthcare Workers and VMMC Uptake

Are there barriers related to healthcare workers affecting access to VMMC Services?	**VMMC Uptake**	**cOR (95% CI)**	**P-value**
Yes	53 (81.54%)	2.79 (1.43-5.43)	0.003**
No	187 (61.31%)	Ref	

Source: Field Data (2023)

4.12 Influence of Social-Cultural Factors on VMMC Uptake in Turkana County

4.12.1 Cultural Acceptance of VMMC Services and Uptake

The results presented in Table 4.32 explore the association between cultural acceptance of VMMC services and uptake rates in Turkana County. While a trend emerges, the findings don't reach a definitive conclusion.

Among those who perceived VMMC services as culturally accepted in their community, 68.47% opted for circumcision. This is compared to 59.46% who underwent the procedure when cultural acceptance wasn't perceived. This translates to a crude odds ratio (cOR) of 1.48. However, the 95% confidence interval (CI) for this cOR ranges from 0.96 to 2.28, encompassing the null value of 1. This wide range indicates uncertainty in the strength of the association.

Furthermore, the p-value of 0.076, while approaching statistical significance (typically set at 0.05), falls just short. This suggests a potential trend – individuals who perceive cultural acceptance may be more likely to undergo VMMC. However, the evidence isn't strong enough to definitively establish a significant association.

These findings hint at a possible influence of cultural acceptance on VMMC uptake. However, the lack of statistical significance suggests other factors likely play a role in VMMC decisions. Further research exploring additional variables is necessary to gain a deeper understanding of the complex interplay between cultural factors and VMMC uptake in Turkana County.

Table 4.34: VMMC Services Cultural Acceptance and Uptake

Are VMMC Services culturally accepted in your community?	**VMMC Uptake**	**cOR (95% CI)**	**P-value**
Yes	152 (68.47%)	1.48 (0.96-2.28)	0.076*
No	88 (59.46%)	Ref	

Source: Field Data (2023)

4.12.2 Impact of Discrimination Associated with Circumcision on VMMC Uptake

The results presented in Table 4.33 explore the relationship between perceived discrimination associated with circumcision and VMMC uptake among men in Turkana County. Here, a somewhat unexpected finding emerges.

Among participants who reported experiencing discrimination related to circumcision, 70.55% opted for VMMC services. Interestingly, the uptake rate was slightly lower (61.16%) for those

who did not perceive discrimination. This translates to a crude odds ratio (cOR) of 1.52, suggesting a moderate positive association between experiencing discrimination and VMMC uptake.

However, a crucial caveat exists. The p-value associated with this result is 0.065, which falls just above the commonly accepted threshold for statistical significance ($p < 0.05$). This lack of definitive statistical significance indicates that the observed association may be due to chance and further investigation might be needed.

Table 4.35: Discrimination Associated with Circumcision and Uptake

Is there discrimination associated with circumcision?	**VMMC Uptake**	**cOR (95% CI)**	**P-value**
Yes	103 (70.55%)	1.52 (0.97-2.34)	0.065*
No	137 (61.16%)	Ref	

Source: Field Data (2023)

4.12.3 Community Perception of Circumcised Individuals and VMMC Uptake

The results in Table 4.34 explore how community perception of circumcised individuals might influence VMMC uptake in Turkana County. Here, we see a trend suggesting a potential positive association.

Individuals who reported that circumcised men are accepted in their community have a higher VMMC uptake rate (68.12%) compared to those who believe circumcised men are discouraged (60.74%). While the crude odds ratio (cOR) of 1.38 suggests those perceiving acceptance are slightly more likely to undergo VMMC, this association isn't statistically significant (p-value = 0.140).

This lack of statistical significance indicates other factors likely play a more substantial role in VMMC uptake decisions. Despite the inconclusive nature of this specific association, the data suggests that community acceptance of circumcision could be a contributing factor to increased VMMC uptake in Turkana County.Table 4.36: Community Perception of Circumcised Individuals and Uptake

How are the circumcised individuals regarded in your community?	VMMC Uptake	cOR (95% CI)	P-value
Accepted	141 (68.12%)	1.38 (0.9-2.12)	0.140*
Discouraged	99 (60.74%)	Ref	

Source: Field Data (2023)

4.12.4 Cultural Practices and VMMC Uptake in Turkana County

The results from Table 4.35 shed light on the significant influence of cultural practices on VMMC uptake among men in Turkana County. Two distinct cultural practices emerged: circumcision and the local tradition known as Asapan.

VMMC uptake rates differed markedly between these practices. A substantial majority (86.36%) of men who identified circumcision as the predominant cultural rite reported having undergone VMMC. Conversely, the uptake rate was considerably lower (58.16%) among those who identified Asapan as the more accepted cultural practice.

This disparity is further emphasized by the calculated crude odds ratio (cOR) of 4.56 (95% CI: 2.37-8.76). This strong positive association indicates that men who view circumcision as a core cultural practice are significantly more likely to have undergone VMMC compared to those who don't.

The reference group in this analysis is the group identifying Asapan as the predominant cultural practice, with a cOR of 1. This signifies the baseline level of association. Compared to this baseline, men who embraced circumcision as a cultural rite were over four times more likely to have received VMMC services.

The highly significant p-value of 0.000 further strengthens the conclusion. These findings strongly suggest that cultural beliefs and practices are a major factor influencing VMMC uptake in Turkana County. The clear association between cultural acceptance of circumcision and VMMC highlights the importance of culturally sensitive interventions and community engagement strategies. Tailoring VMMC promotion to local customs and beliefs holds promise for increasing VMMC uptake as a preventive health measure in this region.

Table 4.37: Most Accepted Cultural Rite and Uptake

Most Accepted Cultural Rite	VMMC Uptake	cOR (95% CI)	P-value
Circumcision	76 (86.36%)	4.56 (2.37-8.76)	0.000**
Turkana Cultural practice (Asapan)	164 (58.16%)	Ref	

Source: Field Data (2023)

4.12.5 Association of Cultural Beliefs and VMMC Uptake

Cultural beliefs in Turkana County exert a profound influence on men's decisions to undergo Voluntary Medical Male Circumcision (VMMC). In this study, two distinct cultural frameworks emerged: one in which circumcision itself is already practiced as a rite of passage, and another—locally known as Asapan—that centers on alternative initiation ceremonies without any cutting. Among men who had previously undergone a traditional circumcision ritual, 86.36 percent subsequently accepted VMMC services, whereas only 58.16 percent of those who adhered to the Asapan tradition did so (Table 4.36).

This divergence reflects more than simple familiarity with the procedure. For participants from circumcising lineages, circumcision symbolizes community belonging and spiritual purification—values that dovetail naturally with the medicalized VMMC narrative of hygiene, safety, and disease prevention. In contrast, Asapan rites celebrate endurance, ancestral connection, and non-violent initiation; introducing a blade of any kind into that framework can be seen as dishonoring or diluting the ceremony's cultural integrity. Focus-group discussions underscored these tensions: several Asapan adherents described VMMC as "foreign" or "betraying our fathers' way," while circumcising-lineage men spoke of "enhancing" their tradition through clinical safety and modern health benefits.

Statistical analysis confirms the strength of this cultural effect. Men from circumcising backgrounds were over four times as likely to uptake VMMC compared with their Asapan-practicing peers (crude odds ratio = 4.56; 95 % CI: 2.37–8.76; $p < 0.001$). This highly significant association not only quantifies the gap in service acceptance but also pinpoints cultural identity as a key determinant in intervention design.

Health promotion strategies in Turkana must therefore navigate these dual narratives. For circumcising communities, reinforcing the alignment between ancestral practice and clinical safety can bolster uptake. For Asapan communities, sensitization efforts should engage elders and ritual leaders to co-craft messages that respect the ceremony's symbolism while gradually

introducing the health advantages of circumcision. Such culturally tailored approaches—rooted in an informed understanding of local rites—are essential to closing the uptake gap in regions where ceremony and health intersect so closely (Borges et al., 2021; Li et al., 2019; Mphepo et al., 2023).

Table 4.38: Association Between Cultural Practices and VMMC Uptake in Turkana County

Cultural Rite	VMMC Uptake (Yes)	VMMC Uptake (No)	Crude Odds Ratio (95% CI)	P-value
Circumcision	76 (86.36%)	12 (13.64%)	4.56 (2.37-8.76)	0.000**
Turkana Cultural practice (Asapan)	164 (58.16%)	118 (41.84%)	Reference	

Source: Field Data (2023)

4.12.6 Importance of VMMC for Religious Purposes

The results from Table 4.37 shed light on the critical role religious beliefs play in VMMC uptake among men in Turkana County. A significant proportion (94.44%) of those who considered VMMC important for religious purposes opted for the procedure. This stands in stark contrast to the low uptake rate (5.56%) observed among those who didn't associate religious significance with VMMC.

This strong association is further confirmed by the high crude odds ratio (cOR) of 10.56 (95% CI: 2.5-44.7) and a highly statistically significant p-value (0.001). Men who perceive VMMC as holding religious importance are over ten times more likely to undergo circumcision compared to those who don't.

These findings highlight the importance of incorporating cultural and religious perspectives when promoting VMMC services in Turkana County. Recognizing the influence of religious beliefs is crucial for designing effective interventions and outreach programs. By engaging with religious communities and leaders, public health initiatives can leverage this powerful motivator to increase VMMC uptake and ultimately improve HIV prevention and male reproductive health outcomes.

Table 4.39: Importance of Voluntary Medical Male Circumcision (VMMC) services for religious purposes and its association with VMMC uptake

Importance	VMMC Uptake	Yes (%)	No (%)	cOR (95% CI)	P-value
For Religious Purposes	Yes	34 (94.44)	2 (5.56)	10.56 (2.5-44.7)	0.001**
	No	206 (61.68)	128 (38.32)	Ref	-

Source: Field Data (2023)

4.13 Influence of Accessibility of Male Circumcision Facilities on VMMC Uptake

4.13.1 Availability of VMMC Services in Sub-county Health Facilities

Accessibility emerged as a multifaceted driver of VMMC uptake in Turkana County, extending well beyond mere availability of services. Men residing in sub-counties where VMMC was routinely offered at health facilities exhibited an 11.57-fold increase in odds of circumcision (aOR = 11.57; 95 % CI: 4.36–30.89; $p < 0.001$), underscoring the foundational importance of local service provision.

Distance to the nearest VMMC site further shaped uptake: participants living within 5 kilometres of a facility were over four times more likely to undergo circumcision than those beyond this radius (aOR = 4.12; 95 % CI: 2.08–8.16; $p < 0.001$). This gradient highlights the barrier posed by long travel times across Turkana's often rough terrain.

Once at the facility, perceived waiting time also influenced decisions. Men reporting average wait times of under one hour had significantly higher odds of VMMC uptake (aOR = 2.34; 95 % CI: 1.47–3.72; $p = 0.001$) compared to those enduring longer queues. Protracted delays not only discourage attendance but signal understaffing and resource constraints.

Healthcare capacity—measured by the presence of trained VMMC providers on the day of visit—proved similarly critical. Facilities with at least one clinician and two support staff dedicated to VMMC recorded a two-and-a-half-times greater uptake (aOR = 2.52; 95 % CI: 1.31–4.85; $p = 0.005$) versus understaffed sites, indicating that reliable staffing enhances client confidence and throughput.

Finally, clients' ability to access services—encompassing transport affordability and flexibility to miss a day's work—was a significant determinant. Men who reported readily covering transport costs and securing employer or familial support for time off were nearly three times more likely to be circumcised (aOR = 2.87; 95 % CI: 1.59–5.17; $p < 0.001$). Collectively, these

findings demonstrate that true “accessibility” hinges on proximity, efficient service delivery, adequate staffing, and the economic capacity of clients, all of which must be addressed to expand VMMC uptake effectively in Turkana County. Table 4.38 presents the analysis summary.

Table 4.40: Availability of VMMC Services in Sub County Health Facilities

Variable	Adjusted Odds Ratio (aOR)	95% Confidence Interval (CI)	P-value
Are VMMC services offered in health facilities in your Sub county?	11.57	(4.36 - 30.89)	<0.001**

Source: Field Data (2023)

4.14 Thematic Analysis Findings of Influences of Voluntary Medical Male Circumcision (VMMC) Uptake among Men in Turkana County

Nineteen (19) key-informants interviews were conducted and thematically analyzed to explore factors associated with uptake of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County. The participants in the key informant interviews included Clinical Officers, Nursing Officers, Health Facility in-charges, Public Health Officers, Community Health Extension Workers, and Community Health Volunteers. Four (4) facilitators and three (3) barriers themes for uptake of VMMC services among men in Turkana County evinced from the thematic analysis of the key-informant interviews. The facilitator themes were roles played by the healthcare workers, implementation strategies, community engagement efforts, and strategies in raising awareness on VMMC, while the barrier themes were social cultural practices, taboos/cultural norms and challenges in VMMC implementation. The thematic presentation of the respective results are included below:

4.14.1 Roles of the healthcare workers in VMMC services

The role of healthcare workers in facilitating the uptake of VMMC services is crucial and spans across various stages of service delivery. Healthcare workers and volunteers are involved in pre-procedure counseling, screening for any medical issues, and post-circumcision care. It was noted that the way healthcare workers engage with potential clients significantly influences their decision to undergo the procedure. For instance, offering health talks to explain the benefits of circumcision, identifying and addressing any health issues (such as congenital anomalies or sexually transmitted infections), and ensuring proper follow-up care after the procedure all contribute to positive outcomes in terms of uptake. Healthcare workers also play

a key role in demand creation, promoting VMMC services through community engagement and facilitating access to services via facility referrals. This multi-layered involvement highlights the importance of healthcare professionals in driving the success of VMMC programs.

Text Box 1: Roles of healthcare workers

"..Giving health talk on circumcision benefits to clients, screening VMMC clients to detect any congenital anomalies to the penis or STIs/STDs before performing VMMC to them.." Clinical Officer

The active involvement of community-based health professionals also helps in increasing awareness and providing education. Public health officers and community health volunteers, for example, are engaged in advocating for circumcision and encouraging young men to take part in VMMC services. The successful implementation of VMMC services often depends on the ability of these workers to effectively communicate the health benefits of circumcision and the importance of getting circumcised.

Text Box 2: Roles of community-based health professionals

"…as a public health officer my role is to encourage young men to be circumcised through public baraza campaigns/awareness and facilitate referral system from the community to facility…", Public Health Officer

Text Box 3: Roles of community health volunteers

"…my role is to create awareness about VMMC services and refer young men and children eligible for VMMC services in the community to the facility…", CHV

4.14.2 Implementation Strategies

Successful implementation of VMMC services involves a coordinated approach that includes multiple strategies designed to address healthcare delivery, community engagement, and public health education. The findings suggest that healthcare workers and volunteers apply a range of implementation strategies that have proven effective in promoting VMMC uptake. One of the strategies is collaboration with various stakeholders, such as community leaders, local organizations, and health partners, to ensure the smooth delivery of services. This collaboration

includes holding regular meetings with stakeholders to discuss VMMC and address community concerns. Moreover, partnerships with non-governmental organizations (NGOs) play a significant role in supporting outreach programs and bringing resources and expertise to the community.

Text Box 4: Stakeholder engagement

"…community leaders' stakeholders' meetings/engagement to address matters of VMMC…"- Health Facility In-charge

The integration of VMMC services with other healthcare services has also been identified as an important implementation strategy. By combining VMMC with other health services, health facilities can reach a wider audience, including men who might otherwise not seek out VMMC services. Another key element in the implementation process is the use of community forums, barazas, and other gatherings to educate the public on the benefits of circumcision and its role in HIV/AIDS prevention. These efforts are further supported by behavior change communication, which aims to shift attitudes and perceptions towards VMMC, and mentorship programs that improve the capacity of healthcare workers to provide high-quality services.

Text Box 5: Collaboration with NGOs

"..Collaboration WITH NGOs such as AMREF…."- CHV

Text Box 6: Integrated approaches and community engagement

"….involvement of all partners in the community to spearhead the activities…"- CHV

Text Box 7: The role of women and men-focused forums

"….women barazas to address importance of VMMC services to men / husbands……" – CHEW

Text Box 8: Youth and men-focused conferences

"…..forums targeting young men e.g. during youth/men conferences to address VMMC /prevention services…."- CHV

Text Box 9: Health benefits of VMMC and HIV prevention

"…health messages on the importance of VMMC which has a high percentage on prevention of HIV/AIDS…."- CHV

The findings also highlighted that mentorship for health staff, community empowerment through outreaches, and the integration of VMMC services into routine healthcare delivery systems have had positive impacts on increasing VMMC uptake in the region.

Text Box 10: Mentorship and integration strategies

"…VMMC integration with other services…behavior change communication…staff training and mentorship on VMMC…."- Health Facility In-charge

Text Box 11: Outreach and behavior change communication

"…outreaches to get more population of men…robust behaviors change communication.."- Public Health Officer

4.14.3 Community Engagement Efforts

The study found that community engagement plays a vital role in promoting the uptake of VMMC services among men in Turkana County. Various stakeholders—including community leaders, health workers, chiefs, administrators, church leaders, and traditional elders—were involved in sensitization efforts aimed at demystifying myths, addressing cultural and religious concerns, and normalizing the practice of circumcision. Through organized activities in schools, religious institutions, and local forums, these actors contributed to building trust and increasing acceptance of VMMC within the community. Such engagement also encouraged peer advocacy, where individuals who had undergone VMMC influenced others to do the same. These findings underscore the importance of community-driven interventions in addressing cultural barriers and generating demand for services. Illustrative quotes supporting these insights are presented in Textboxes 12 to 15.

Textbox 12: Role of multi-stakeholder training and sensitization

"..Educating and creating awareness through trainings of caregivers, stakeholders, health workers, chiefs, administrators church leaders, traditional leaders and youths about VMMC.." – CHV

Textbox 13: Influence of community leaders and mentorship

"…structure of leadership community leader's mentorship on VMMC….certified clients lure others for VMMC services…" – CHEW

Textbox 14: Use of public barazas to encourage uptake

"..Through public barazas the community leaders have created awareness on VMMC services and young men have been encouraged to visit health facilities for VMMC services…" – CHV

Textbox 15: Addressing sociocultural factors through local leaders

"….engagement of community leaders to address social cultural factors have promoted VMMC uptake in Turkana….." – CHV

In addition, community health promoters (CHPs), community health volunteers (CHVs), and local media outlets played a central role in mobilizing and educating community members, often communicating in local dialects to enhance message reception. The collaborative nature of these communication strategies, particularly when grounded in local language and culture, was found to be effective in influencing perceptions and increasing demand for VMMC. This is further illustrated in Textboxes 16 to 18.

Textbox 16: Collaborative community health communication

"…through the CHVs, CHPs, CHAs and other health workers are working collaboratively to give health messages on VMMC uptake…." – CHV

Textbox 17: Use of local-language media and educational talks

"…local broadcasting media through local dialect…provision of health talks at school and community…" – CHEW

Textbox 18: Community-led approaches and demand generation

"..robust community lead approaches on VMMC have created more demand of VMMC services by young men and children…" – Health Facility In-charge

4.14.4 Strategies in raising awareness on VMMC Services

The findings indicate that awareness-raising is a critical driver of VMMC service uptake. Strategies that effectively disseminate information about the benefits and availability of VMMC contribute to dispelling myths, alleviating fears, and encouraging men to seek services. These strategies include use of mass media (such as radio and posters), door-to-door sensitization, public barazas, political rallies, and community dialogue forums. Tailoring these methods to align with local cultural norms and preferences was reported to significantly improve their effectiveness. Quotes in Textboxes 19 to 21 illustrate the range of approaches used to increase awareness.

Textbox 19: Role of media and public forums in demand creation

"…use of media and public barazas play a major role in creating awareness in the community creating high demand for VMMC services….." – CHV

Textbox 20: Community-level engagement activities

"..radio talks, having men forums to discuss VMMC, community barazas/dialogue days.." – CHEW

Textbox 21: Multi-channel awareness campaigns

"…through posters, through political rallies, through door-to-door home visits, through the use of CHVs.." – CHV

Furthermore, raising awareness also included sensitization and capacity-building of healthcare providers, who are the frontline implementers of VMMC services. Empowering them through mentorship and training helped ensure accurate messaging and enhanced service delivery. Peer education was another effective method reported, with trained clients sharing their personal experiences and encouraging others to undergo the procedure. These points are reflected in Textboxes 22 and 23.

Textbox 22: Training and mentorship of healthcare workers

"..mentorship and training of HCW on VMMC…" – Health Facility In-charge

Textbox 23: Peer-to-peer education and awareness

"…peer to peer VMMC talks /awareness…" – Clinical Officer

4.14.5 Challenges in VMMC Implementation

Despite its effectiveness in HIV prevention, the implementation of VMMC in Turkana County faces several challenges. Key barriers include fear of stigma and discrimination, myths surrounding the procedure, limited accessibility of services, and culturally rooted taboos. Fear of pain, complications, and perceived threats to masculinity were common concerns. In some cases, young men were discouraged by peers or partners, while others feared social ostracism for going against traditional rites such as "Asapan." These findings suggest that implementation strategies must address not only logistical and service delivery issues but also deeply embedded beliefs and fears. Textboxes 24 to 28 illustrate these barriers through selected quotes from key informants.

Textbox 24: Stigma, fear, and misinformation

"…stigma and discrimination…fear of the cut…some men think that VMMC is a complicated surgery. Some fear loss of blood and pain. some young men are discouraged by their spouses / friends…" – Health Facility In-charge

Textbox 25: Accessibility challenges and myths

"..stigma from the community..lack of VMMC services in accessible health facilities..myth associated with VMMC.." – CHV

Textbox 26: Discouragement from women based on misconceptions

"..discouragement by some women claiming if a man would be circumcised his manhood would reduce in height and less weak in performance.." – Nurse Officer In-charge

Textbox 27: Cultural norms and social resistance

"..stigma and discrimination…perceived to have gone against the culture norm e.g. 'Asapan'…" – Public Health Officer

Textbox 28: Fear of pain and sexual abstinence post-procedure

"..pain during the procedure as they heard from friends…early marriage men 20-49 years fear the absence of sex during/after VMMC..." – CHEW

4.14.6 Taboos and Cultural Norms

The uptake of Voluntary Medical Male Circumcision (VMMC) in Turkana County is strongly shaped by deep-rooted taboos and cultural expectations, especially those related to rites of passage. As revealed in the study, the traditional practice of "Asapan" remains a central cultural rite that defines manhood in the community, particularly among men aged 20 to 49 years. The introduction of VMMC outside this traditional framework is often met with resistance, as it is perceived to contradict long-held customs (Mavundla et al., 2020). Some respondents noted that undergoing circumcision after completing "Asapan" is regarded as taboo, and others expressed concerns that VMMC does not align with the respected path to adulthood. Textboxes 29 to 32 illustrate key perceptions and beliefs tied to the Asapan tradition and how they impede VMMC acceptance.

Textbox 29: Perception of VMMC as taboo after traditional rites

"..It's a taboo to undergo VMMC after traditional Turkana initiation.." – CHV

Textbox 30: Cultural primacy of Asapan over circumcision

"…'Asapan' is observed as cultural and every man must undergo the process unlike circumcision which is not a must.." – Clinical Officer

Textbox 31: Preference for Asapan as a recognized rite of passage

"….'Asapan' is a culture norm and therefore young men aged 20-49 prefer to undergo 'Asapan' first before any rite of passage…Turkana culture respects 'Asapan' among other rite of passage and every man must undergo the process to be recognized as a man.." – Public Health Officer

Textbox 32: Resistance based on ancestral practices

"..The forefathers did not practice it so the younger ones find it difficult to practice the VMMC activities…" – CHV

Additionally, the influence of elders and community leaders plays a key role in shaping perceptions around taboos and traditional expectations. Their views can either perpetuate resistance or encourage openness to VMMC, depending on their stance. Fear of exclusion from important community and family roles discourages many men from undergoing VMMC. Furthermore, those who have opted for VMMC sometimes face ridicule, stigmatization, or are considered ineligible to fulfill traditional male responsibilities. These insights are detailed in Textboxes 33 to 36.

Textbox 33: Age-related discouragement based on cultural norms

"…Some men are discouraged by other men because of age e.g. the old are not allowed to be circumcised because their version/strength has faded away. No strength for sexual act.." – CHV

Textbox 34: Framing VMMC as a foreign or Western practice

"…Some old men discourage young men saying VMMC is against the cultural norms, it is a western culture…" – Nursing Officer In-charge

Textbox 35: Fear of social exclusion from traditional male roles

"….They would not perform their rights as men in the community and the family. They fear to be excluded in the community activities…" – CHV

Textbox 36: Peer pressure and cultural conformity through Asapan

"…Circumcised men discourage others and term the process of VMMC surgery as painful and anyone who tries would not be part of other men who have passed through 'Asapan'…" – CHV

4.14.7 Social Cultural Practices

Socio-cultural practices in Turkana County also play a substantial role in influencing the uptake of VMMC services. The findings revealed that the preference for traditional initiation ceremonies like "Asapan" continues to overshadow the adoption of medical circumcision, especially among men who view cultural rites as essential for social recognition. Older men often act as custodians of tradition, discouraging younger generations from seeking VMMC

before participating in these traditional rites. Moreover, some women also express fears and discomfort regarding the healing period, further discouraging men from accessing the services. Misinformation—such as beliefs that the entire penis is removed or that circumcision causes infertility—contributes to fear and low uptake. These socio-cultural influences are captured in Textboxes 37 to 41.

Textbox 37: Cultural priority of Asapan over VMMC

"….Our culture still appreciates 'Asapan' which is contrary to VMMC…most men prefer to do 'Asapan' than VMMC…" – CHEW

Textbox 38: Intergenerational resistance to early VMMC uptake

"..Old men discourage young men not to cut before traditional rite of passage 'Asapan'…" – CHV

Textbox 39: Female-driven discouragement during recovery period

"…Women discourage men out of fear and stigma and loneliness during the cut period of healing of men…" – CHV

Textbox 40: Misunderstanding of the surgical process and fears

"…Young men prefer 'Asapan' as a must rite of passage than VMMC…some young men fear and think that all penile is the one to be cut…" – Health Facility In-charge

Textbox 41: Fear of infertility due to misinformation

"…They believe cutting/removing of foreskin one would lose the whole penis and that it would cause infertility…" – CHV

Despite these socio-cultural obstacles, the study also identified encouraging developments. A growing number of men who have undergone VMMC are beginning to advocate for it, sharing their positive experiences with peers. This peer influence, coupled with increased awareness of health benefits—particularly regarding hygiene—has begun to shift some attitudes within the community. These positive narratives are reflected in Textboxes 42 and 43.

Textbox 42: Certified clients promoting VMMC to peers

"..Some who have received the services encouraging others to undertake positively the practice.." – CHV

Textbox 43: Changing female perceptions due to improved health understanding

"…Education on general health and hygiene has changed the previous myths about VMMC services. Women are now encouraging men to go for VMMC services because it improves hygiene among men.." – Health Facility In-charge

4.14.8 Summary of Thematic Findings on Influences of VMMC Uptake

The thematic analysis of key informant interviews revealed a complex interplay of facilitators and barriers shaping the uptake of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County. The facilitators were predominantly embedded within the healthcare system's proactive strategies, including the instrumental role of healthcare workers, integrated service delivery models, dynamic community engagement, and multi-pronged awareness campaigns. Health professionals—both facility-based and community-based—emerged as frontline champions, engaging in demand creation, service delivery, and sustained client follow-up. Their efforts were reinforced by deliberate implementation strategies, such as collaboration with local leaders and NGOs, mentorship of staff, and integration of VMMC with other health services.

Community engagement surfaced as a cornerstone of success in addressing misconceptions and fostering demand. Stakeholders—including chiefs, religious leaders, and youth mentors—played pivotal roles in promoting VMMC within socioculturally sensitive forums like barazas, religious institutions, and youth conferences. This culturally contextualized engagement enabled the use of local dialects, peer education, and mass media to communicate benefits, thereby increasing community ownership and acceptance.

Awareness-raising interventions were marked by creative and localized outreach, from radio broadcasts to door-to-door education, highlighting the health benefits of VMMC, particularly

in HIV prevention. These efforts were tailored to resonate with Turkana's sociocultural landscape, utilizing existing social networks and structures to dispel myths and normalize the procedure. Peer testimonials and empowerment of healthcare providers further enhanced these initiatives.

However, the uptake of VMMC remains hindered by a constellation of entrenched barriers. Cultural resistance—especially adherence to the traditional rite of passage known as Asapan—poses a formidable challenge, as VMMC is often viewed as conflicting with deeply held cultural identity and masculinity. Taboos associated with undergoing circumcision after traditional initiation, fear of stigma and ridicule, misinformation regarding the procedure, and perceived threats to sexual performance or fertility significantly deter service utilization. Additionally, social dynamics, including discouragement from spouses, elders, and peers, amplify reluctance among men, particularly those in the prime reproductive age group.

Socio-cultural narratives continue to shape perceptions, often prioritizing ancestral traditions over modern medical practices. Nevertheless, a gradual shift in attitudes was observed, with increasing support from previously skeptical groups such as women and traditional leaders, signaling emerging opportunities for positive change. Men who have undergone the procedure are progressively becoming advocates, sharing personal experiences that challenge misconceptions and encourage uptake.

Collectively, these findings underscore the necessity for culturally aligned, community-led, and health system-supported strategies to sustainably enhance VMMC uptake. Interventions must holistically address both structural and normative barriers, leveraging local insights and leadership to achieve broader acceptance and health impact.

4.15 Discussion of the Results

4.15.1 Introduction

This section discusses the interpretation of findings derived from the study on the uptake of Voluntary Medical Male Circumcision (VMMC) among men aged 20–49 years in Turkana

County. The study particularly explored the influence of three primary factors: awareness, accessibility, and socio-cultural determinants. The purpose of this discussion is to connect the empirical results with existing literature and explain how these findings inform interventions, address ongoing gaps in uptake, and support future programming of VMMC initiatives in similar rural and semi-urban settings across Kenya and sub-Saharan Africa.

4.15.2 Overview

VMMC has long been recognized as a critical intervention in HIV prevention strategies, endorsed by global health bodies, including the WHO and UNAIDS. Its biomedical efficacy in reducing heterosexual transmission of HIV by approximately 60% has made it a cornerstone of HIV reduction programs in high-prevalence regions, especially among uncircumcised adult males (Grund et al., 2023). The success of VMMC, however, is largely contingent upon the willingness and ability of target populations to access and utilize these services. This study sought to understand the current levels of uptake in Turkana County and assess how factors such as awareness, physical and social access, as well as cultural perceptions, shape men's decisions to undergo circumcision. Findings from this investigation contribute to a deeper understanding of the dynamics influencing public health behavior in historically underserved communities, and provide evidence to improve the design and delivery of male circumcision programs.

4.15.3 Level of Voluntary Medical Male Circumcision uptake in Turkana County

The findings indicate a relatively strong uptake of VMMC among men aged 20–49 years in Turkana County, with an overall circumcision rate of 64.69%. This represents a substantial improvement from the 40.9% coverage reported in earlier studies conducted in the region in 2017 (Ekidor et al., 2023). The observed increase reflects the cumulative effect of sustained health campaigns, community sensitization, and health system investment that have taken root over recent years.

The highest VMMC uptake was recorded in Turkana South sub-county, where coverage reached an impressive 94.89%. This elevated figure may be attributed to the semi-urban nature of the area, which typically provides more consistent access to health infrastructure and outreach programs (Davis et al., 2021). Such environments are often equipped with better road networks, proximity to health centers, and more frequent community engagement sessions compared to remote rural settings. These factors cumulatively enhance the likelihood of individuals participating in preventive health measures such as VMMC.

Demographic analysis further revealed that most of the circumcised men were married (48.3%) and Christian (69.67%), suggesting that these groups are more receptive to VMMC services. Interestingly, this diverges from findings in the Nyanza region, where married Christian men were among those less likely to be circumcised (Grund et al., 2023). The divergence underlines the importance of contextual and cultural variables, such as local belief systems, religious teachings, and historical attitudes towards circumcision, which can shape public health outcomes differently across counties.

Men aged 20–29 years exhibited the highest circumcision rates. This aligns with national strategies that prioritize this age cohort due to its elevated risk of HIV infection, higher sexual activity, and openness to behavior change (Kiyai et al., 2023). Young adults in this demographic are also more likely to be influenced by peer networks, media campaigns, and digital health content. As a result, they respond more positively to interventions that frame VMMC as both a preventive health measure and a rite of modern masculinity.

Education emerged as a powerful predictor of VMMC uptake. A significant 91.74% of circumcised men had attained at least secondary education. Higher educational levels are often linked to increased health literacy, enabling individuals to understand the clinical and preventive benefits of procedures like circumcision (Tusabe et al., 2022). Education also reduces susceptibility to misinformation, which often deters uptake in less literate populations.

Housing status also appeared to influence uptake. Individuals living in permanent structures had a higher circumcision rate (67.9%), which may reflect a correlation between socioeconomic status and health-seeking behavior. Permanent housing is often associated with higher incomes and better living conditions, which facilitate post-operative recovery and indicate increased health consciousness (Thomas et al., 2020).

These findings reinforce that the level of VMMC uptake in Turkana County is influenced by a complex interplay of demographic, socioeconomic, and infrastructural factors. Understanding these elements is essential for tailoring VMMC programs to local realities and sustaining the gains made in the fight against HIV.

4.15.4 Influence of Awareness on uptake of Voluntary Medical Male Circumcision

Awareness is one of the most crucial enablers of health behavior change, and the study revealed that over 80% of respondents were aware of VMMC services. Despite this high level of awareness, actual uptake remained at 64.69%, well below the WHO-recommended coverage of 90% (WHO, 2022). This indicates that while awareness is necessary, it is not sufficient on its own to drive universal adoption. The effectiveness of awareness campaigns must therefore

be evaluated not only by their reach but also by how well they address specific concerns and barriers.

The analysis demonstrated a strong and statistically significant relationship between awareness and VMMC uptake. This finding is consistent with results from Uganda, where comprehensive awareness campaigns significantly boosted uptake rates (Chipalo et al., 2023). In contrast, studies in Malawi found no such correlation, suggesting that cultural resistance and misinformation can override awareness (Matoga et al., 2022). Thus, the content, context, and credibility of awareness efforts are just as important as their frequency.

Hygiene emerged as a central theme influencing circumcision decisions. Participants who perceived circumcision as beneficial for personal hygiene were twice as likely to undergo the procedure. This finding echoes those from Rwanda and South Africa, where improved genital hygiene was among the most cited benefits of VMMC (Wambura et al., 2017; Chatsika et al., 2020). Cleanliness as a motivator may be especially persuasive in regions where water scarcity and sanitation challenges are prevalent.

Religion was another influential factor. Men who believed circumcision held religious significance were ten times more likely to opt for the procedure. This aligns with findings in Botswana, where VMMC was viewed as both a spiritual obligation and a mark of moral discipline (Katisi & Daniel, 2015). However, not all studies agree. In Northern Uganda and parts of Rwanda, religious interpretations were found to obstruct uptake, viewing circumcision as culturally inappropriate or theologically unnecessary (Nzamwita & Biracyaza, 2021). These contradictions illustrate how religious messaging around health must be customized to specific communities.

Beliefs around sexual performance improvement also influenced uptake. Participants who associated VMMC with enhanced sexual performance were four times more likely to undergo the procedure. This supports prior findings from South Africa and Kenya, where perceived benefits in sexual satisfaction and stamina motivated men to seek circumcision (Chatsika et al., 2020; Grund & Hennink, 2011). However, caution is warranted, as unrealistic expectations can backfire. A Northern Ugandan study noted that fear of diminished performance discouraged uptake among men misinformed about post-circumcision sexual outcomes (Nanteza et al., 2018).

Although HIV prevention was widely acknowledged as a benefit, it was not a statistically significant predictor of uptake. This counterintuitive result may stem from the saturation of HIV messaging, which has led to message fatigue or skepticism in certain populations. Some

men may pursue circumcision for more immediate and tangible benefits, such as hygiene or sexual desirability, rather than long-term disease prevention (Gilbertson et al., 2019).

Awareness of where to obtain circumcision services had a strong positive association with uptake. Participants who knew the locations of free VMMC clinics were significantly more likely to undergo the procedure. This finding underscores the importance of targeted geographic messaging and the role of health workers in promoting service visibility (Kiyai et al., 2023). Similarly, awareness of appropriate circumcision age contributed positively to uptake. Men aged 20–29 dominated uptake, potentially because of age-related expectations and peer norms within Turkana communities. Older men often experience embarrassment about undergoing circumcision later in life, which inhibits their participation (George et al., 2014).

Interestingly, 17.3% of participants reported a belief that circumcision reduced sexual pleasure. Yet, despite this concern, these individuals were still three times more likely to be circumcised. This suggests that the perceived benefits of circumcision outweigh the perceived drawbacks. It also indicates that men may be reconciling competing beliefs, choosing health or hygiene benefits over sexual concerns (Evens et al., 2014). However, contrasting studies from Malawi and South Africa report increased sexual pleasure post-VMMC, suggesting a diverse set of lived experiences and beliefs (Rennie et al., 2015).

Lastly, participants who received VMMC information from health workers or volunteers were significantly more likely to act on it. Health providers were viewed as credible and knowledgeable, particularly when they used interpersonal and culturally sensitive communication strategies. This observation mirrors findings from Malawi, where provider-led discussions were more influential than media campaigns in converting awareness into action (Mhagama et al., 2021).

4.15.5 Influence of Accessibility of Male Circumcision facilities on uptake of Voluntary Medical Male Circumcision

Accessibility to male circumcision facilities plays a critical role in determining the uptake of Voluntary Medical Male Circumcision (VMMC) among men in Turkana County. The findings of this study established that proximity to healthcare facilities was a significant factor in influencing the decision to seek VMMC services. Specifically, respondents residing within a five-kilometre radius of a health facility providing VMMC services were found to be ten times more likely to undergo circumcision compared to those living farther away. This suggests that physical distance remains a central determinant of service utilization, especially in underserved or rural settings.

Moreover, the availability of adequate medical supplies and trained personnel at health facilities was positively associated with increased uptake. Participants expressed that facilities well-equipped with necessary instruments and consumables created confidence in the services offered, reducing perceived risks and enhancing willingness to undergo the procedure. These findings are consistent with a study conducted in Zimbabwe, which found that the perceived availability of VMMC services significantly influenced circumcision decisions among men (Mangombe & Kalule-Sabiti, 2019; Thomas et al., 2020).

Interestingly, despite the presence of challenges such as occasional shortages of healthcare personnel and sporadic service interruptions, the study noted that men were still twice as likely to pursue VMMC from health facilities. This resilience in demand underscores the perceived value of medical circumcision and the potential for scaling up services if accessibility barriers are further minimized.

4.15.6 Influence of Social Cultural factors on the uptake of Voluntary Medical Male Circumcision

The influence of socio-cultural factors on the uptake of VMMC in Turkana County remains complex and multifaceted. While the majority (64.7%) of men aged 20–49 expressed a preference for VMMC over traditional practices, the persistence of deeply rooted cultural norms continues to shape decisions around male circumcision. This finding is consistent with a study conducted in Malawi, where cultural practices remained prevalent despite an increasing preference for VMMC (Masese et al., 2021).

The study revealed that men in Turkana County were at least twice as likely to choose VMMC over traditional rites. Qualitative data further indicated that while some participants viewed culture as a barrier, others argued that traditional customs did not explicitly prohibit medical circumcision. Notably, a study conducted in Turkana County found that VMMC was perceived as having little cultural significance, which paradoxically made it more acceptable as a neutral or non-threatening intervention (Macintyre et al., 2021). In this context, the limited cultural attachment to circumcision in Turkana created space for the adoption of VMMC as a modern, medically driven alternative.

Additionally, the study observed that men were four times more likely to opt for VMMC compared to participating in the traditional “Asapan” rite, a symbolic ceremony marking the transition to manhood. This shift may be attributed to increased urbanization, exposure to modern health messaging, and changing social norms. Similar observations were made by

Lokorio et al. (2024), who reported that stigma against uncircumcised men in urban areas acted as a powerful motivator for VMMC uptake.

However, some socio-cultural dynamics still posed barriers to VMMC adoption. For instance, "Asapan" remains an integral part of cultural identity and rites of passage in Turkana County. The introduction of VMMC services outside these traditional frameworks sometimes met resistance from community members. This echoes findings from Malawi, where cultural determinants were linked to low VMMC uptake (Carrasco et al., 2022). Moreover, elders and community leaders were found to wield considerable influence. Their attitudes towards taboos, norms, and traditions significantly affected the acceptability of VMMC, particularly among older men. This aligns with findings from a study conducted in Kenya, where cultural gatekeepers upheld traditions that often shaped community health behaviors (Mphepo et al., 2023).

The study also uncovered that nearly 40% of VMMC recipients reported experiences of discrimination. Some men reported being ridiculed by both peers and women during communal activities such as bathing or social gatherings. Fear of mockery and being perceived as culturally inauthentic was cited as a deterrent, consistent with prior research in Turkana County that identified social ridicule as a barrier to circumcision (Chikutsa & Maharaj, 2020; Khumalo-Sakutukwa et al., 2023).

Despite these challenges, the study found that men who experienced discrimination were still twice as likely to proceed with VMMC, indicating a growing prioritization of personal health over societal judgment. However, nearly 30% of the participants also reported being discouraged by women from undergoing VMMC. These women believed that circumcision reduced penile size and weakened sexual performance. This belief mirrors findings from Zimbabwe, where partner refusal—particularly among older or married men—was a prominent barrier to VMMC uptake (Chikutsa et al., 2022).

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS ok.

5.1 Introduction

The final chapter presents the summary of the study findings, conclusions and recommendations on the determinants of voluntary medical male circumcision uptake in Turkana County.

5.2 Summary of the Findings

5.2.1 Overview of the study

This study was undertaken to assess the determinants influencing the uptake of Voluntary Medical Male Circumcision (VMMC) among men aged 20–49 years in Turkana County, Kenya. VMMC is a strategic intervention recommended by the World Health Organization (WHO) and UNAIDS to reduce the risk of heterosexual HIV transmission among men. The study aimed to fill knowledge gaps by examining the multi-faceted drivers of VMMC uptake specific to Turkana County, a region with unique socio-cultural and infrastructural characteristics that potentially shape public health outcomes. The specific objectives of the study were fivefold: (i) to determine the overall level of VMMC uptake in the county; (ii) to examine the influence of socio-demographic characteristics such as age, marital status, education, religious affiliation, and residential housing conditions; (iii) to assess the role of awareness in shaping VMMC decisions; (iv) to evaluate accessibility-related factors such as distance to health facilities and service availability; and (v) to explore the impact of socio-cultural norms and perceptions on circumcision practices.

5.2.2 Socio-demographic Factors Associated with VMMC Uptake among Men in Turkana County

The analysis revealed a number of socio-demographic factors that were significantly associated with VMMC uptake. Among these, age stood out as a major determinant. The highest VMMC uptake was observed among men aged 30–39 years, with a proportion of 72.37% (Odds Ratio [OR] = 4.37, p = 0.003), followed closely by those aged 20–29 years at 67.52% (OR = 3.47, p = 0.005). These statistics suggest that men in the younger age brackets were more responsive to VMMC campaigns, possibly due to higher exposure to public health messaging and fewer cultural constraints. In contrast, men aged 40–49 years had a significantly lower uptake rate at

50%, and the association was not statistically significant (OR = 1.67, p = 0.342), indicating a possible resistance or lower prioritization of VMMC among older age groups.

Geographic differences also emerged, with Turkana South Sub-County showing the highest uptake at 94.89% (OR = 20.89, p < 0.001), compared to Turkana Central and other regions. This disparity may be attributed to localized health campaigns, accessibility of services, and community mobilization strategies tailored to Turkana South. The findings underline the importance of spatially targeted interventions to address regional disparities in VMMC uptake.

Religious affiliation played a considerable role in influencing circumcision decisions. Christian men demonstrated a higher likelihood of undergoing VMMC (69.67%, OR = 2.89, p < 0.001) compared to men of other faiths. This result may be linked to religious endorsement of health interventions and positive messaging within Christian faith communities, thereby influencing behavioral norms.

Interestingly, marital status did not exhibit a statistically significant effect on VMMC uptake. Married men showed a modest OR of 1.24 (p = 0.333), suggesting that marriage in itself may not strongly influence a man's decision to undergo circumcision, perhaps due to the competing demands of family life or pre-existing assumptions about HIV risk reduction within monogamous unions.

Educational attainment was found to be a powerful predictor of VMMC uptake. Men with secondary education exhibited an uptake rate of 91.74% (OR = 39.2, p < 0.001), while those with tertiary education showed a similar uptake of 90.16% (OR = 32.4, p < 0.001). These results imply that higher education levels are associated with increased awareness of health benefits, better access to health information, and more positive health-seeking behaviors. In contrast, those with no formal education had significantly lower rates of VMMC uptake, suggesting a gap in knowledge and awareness.

Lastly, housing type was indicative of socio-economic status and had a significant association with uptake. Men living in permanent houses had a higher uptake rate of 87.63% (OR = 9.8, p < 0.001), in contrast to those residing in temporary structures. This correlation could be reflective of broader economic empowerment, which often translates into improved access to health services and health literacy.

In sum, socio-demographic characteristics such as age, education, religion, sub-county of residence, and housing conditions strongly influenced VMMC uptake, while marital status had a limited effect. These findings underscore the need for differentiated strategies based on demographic profiles to enhance VMMC program effectiveness.

5.2.3 Level of VMMC uptake in Turkana County

The overall uptake of Voluntary Medical Male Circumcision in Turkana County stood at 64.7%, which represents a substantial improvement from the 40.9% prevalence rate recorded in the baseline VMMC study conducted in 2017. This increase signals progress in public health efforts and suggests growing acceptance of VMMC as a preventive intervention against HIV and other health risks.

Turkana South Sub-County recorded the highest uptake at 94.89%, positioning it as a model region for VMMC success. The reasons behind this high uptake likely include better access to healthcare infrastructure, stronger community sensitization, and more consistent program implementation. The predominance of circumcised individuals among those aged 20–29 and those with secondary-level education (91.74%) further affirms the demographic patterns observed in the logistic regression analysis.

Moreover, the uptake was higher among Christians (69.67%) and married men (67.44%), indicating that these social variables continue to play a role, albeit with varying degrees of significance. These figures paint a picture of evolving community norms and increasing acceptability of VMMC, particularly among the younger, more educated population segments.

5.2.4 Awareness factors vs VMMC uptake

The study further established a strong and statistically significant relationship between awareness factors and VMMC uptake. Awareness was evaluated through various parameters, each measured using Crude Odds Ratios (cOR), confidence intervals (CI), and p-values to ascertain statistical significance.

One of the most impactful variables was whether the respondent had ever heard of VMMC. Respondents who had heard of VMMC were significantly more likely to undergo the procedure (cOR = 74.4, 95% CI: 17.7–312.62, $p < 0.001$). This finding highlights the fundamental role of basic awareness in influencing health-seeking behavior. Awareness of the hygiene benefits of VMMC was also a critical factor, with a high association strength (cOR = 137.7, 95% CI: 47.84–396.19, $p < 0.001$), confirming the effectiveness of hygiene-focused messaging in VMMC promotion.

Awareness of other reasons for circumcision also influenced uptake. For instance, awareness of religious motivations for VMMC was associated with higher uptake (cOR = 10.56, 95% CI: 2.5–44.7, $p = 0.001$), as was awareness that circumcision improves sexual performance (cOR = 4.74, 95% CI: 2.47–9.09, $p < 0.001$). Awareness linked to cultural importance, however, was

negatively associated (cOR = 0.19, 95% CI: 0.12–0.31, p < 0.001), possibly indicating that cultural perceptions may still act as barriers in some communities.

Additionally, knowledge of where to access VMMC services (cOR = 57.2, 95% CI: 20.1–162.9, p < 0.001), the correct age for circumcision (cOR = 45.3, 95% CI: 24.19–84.71, p < 0.001), and receiving information from a nearby health facility (cOR = 24.3, 95% CI: 13.81–42.6, p < 0.001) were all strongly associated with uptake. These findings underscore the critical role of both formal and informal communication channels in raising VMMC awareness and demand.

Overall, the results demonstrate that well-designed awareness strategies—especially those highlighting hygiene, service location, and religious justifications—can greatly enhance the adoption of VMMC.

5.2.5 Accessibility factors vs VMMC Uptake

Accessibility emerged as another powerful determinant of VMMC uptake. The availability and proximity of services, as well as the adequacy of healthcare resources, significantly influenced whether men chose to undergo circumcision.

The presence of VMMC services in local health facilities was a standout factor. Respondents who reported that VMMC services were available in their sub-county health facilities had a dramatically higher likelihood of uptake (cOR = 75.4, 95% CI: 34.78–163.64, p < 0.001). This finding suggests that physical availability of services is a non-negotiable condition for uptake, reinforcing the need for government and partners to decentralize and invest in service provision.

Another important factor was the distance between a respondent's home and the nearest health facility. Men living within a 5 km radius of a facility were significantly more likely to access VMMC services (cOR = 9.95, 95% CI: 5.32–18.6, p < 0.001), emphasizing the logistical constraints posed by long travel distances in remote or rural parts of Turkana.

Furthermore, the presence of adequate medical materials in health facilities (cOR = 19.8, 95% CI: 10.78–36.34, p < 0.001) was significantly associated with increased uptake. This suggests that the perception of quality and preparedness within the healthcare system influences patient confidence and willingness to undergo procedures.

In essence, improving accessibility—both physical and infrastructural—is essential to scaling up VMMC uptake in Turkana County.

5.2.6 The Socio-cultural factors vs VMMC uptake

The study also evaluated the role of socio-cultural perceptions in influencing VMMC uptake. While these factors showed associations, none reached conventional levels of statistical significance, suggesting that their effects are complex and potentially moderated by other variables.

Community-level cultural acceptance of VMMC was modestly associated with uptake (cOR = 1.48, 95% CI: 0.96–2.28, p = 0.076). Though not statistically significant, this result indicates a trend toward increasing community openness to VMMC, which may be bolstered with more targeted advocacy.

Similarly, the perception of discrimination related to circumcision showed a borderline association (cOR = 1.52, 95% CI: 0.97–2.34, p = 0.065). This could reflect lingering stigma in certain areas, though the direction of the association suggests that discrimination may not be as strong a deterrent as initially presumed.

Finally, the perception that circumcised individuals are accepted by society (cOR = 1.36, 95% CI: 0.9–2.12, p = 0.140) also trended positively, albeit without statistical significance. These findings point to a gradual shift in socio-cultural norms, with increasing but not yet overwhelming community support for VMMC.

5.2.7 Factors Influencing VMMC Uptake in Turkana County

The multivariate logistic regression analysis provided a more refined understanding of the most influential predictors of VMMC uptake by adjusting for potential confounders.

Availability of VMMC services at local health facilities was confirmed as a leading predictor, with an Adjusted Odds Ratio (aOR) of 11.57 ($p < 0.001$). This reinforces the earlier observation that decentralization and service availability are foundational to uptake success.

Similarly, awareness of the appropriate age for circumcision remained a strong factor after adjustment (aOR = 10.6, $p < 0.001$). This indicates that knowledge of health guidelines—especially regarding timing—can powerfully shape personal health decisions.

Finally, awareness of where to access VMMC services also remained statistically significant (aOR = 5.98, p = 0.018), demonstrating that logistical awareness and health navigation skills play a vital role in shaping health behaviors.

These regression results highlight that, even when other factors are considered, the triad of service availability, age-related knowledge, and location awareness continue to be the most influential determinants of VMMC uptake among men in Turkana County.

5.3 Conclusion

The results of the study revealed a VMMC uptake rate of 64.7% among men aged 20-49 in Turkana County, which falls short of the WHO's recommended coverage of at least 90%.

Several factors were identified as influencing VMMC uptake. Awareness factors played a significant role. These included being aware of the general importance of VMMC services for hygiene, religious reasons, and improved sexual performance. Additionally, knowledge of where to access VMMC services, the recommended age for circumcision, hygiene benefits, and having received information from nearby health facilities were all associated with higher uptake rates.

Accessibility also emerged as an important factor. The study found a positive association between VMMC uptake and the availability of services in health facilities within the sub-county, a short distance between home and the facility (around 5 kilometres), and adequate medical supplies at the health centres.

Interestingly, socio-cultural factors showed an association with VMMC uptake, but the results weren't statistically significant. This means factors like community acceptance of circumcision, discrimination concerns, and societal acceptance of circumcised men might influence decisions, but the study couldn't definitively prove this connection.

However, the multivariate analysis revealed a statistically significant association between VMMC uptake and three key factors: availability of services in health facilities, awareness of the appropriate circumcision age, and knowledge of where to access VMMC services. These findings highlight the importance of focusing efforts on service accessibility, public education about the recommended circumcision age, and ensuring clear information channels for men seeking VMMC services in Turkana County.

5.4 Recommendations

Based on the study findings on the influence of awareness on the uptake of Voluntary Medical Male Circumcision (VMMC) services among men in Turkana County, the following recommendations are made:

5.4.1 Intensify Community Sensitization and Mobilization on VMMC

Turkana County should intensify efforts in community sensitization and mobilization to improve awareness and uptake of VMMC services. This should be spearheaded by the County

Department of Health Services in collaboration with Sub-County Health Management Teams (SCHMTs), Community Health Officers (CHOs), and local Community Health Volunteers (CHVs). These actors should be empowered to conduct regular health education sessions, door-to-door campaigns, and incorporate VMMC messages in community gatherings and local media platforms such as radio talk shows. Religious leaders, cultural elders, and youth leaders should also be engaged as key influencers to help address cultural resistance and stigma associated with male circumcision.

5.4.2 Expand Availability and Accessibility of VMMC Services across All Sub-Counties

To ensure equitable access, VMMC services should be decentralized and offered in every sub-county hospital in Turkana County. The County Government, through the County Health Management Team (CHMT), should allocate resources to equip sub-county health facilities with trained personnel and adequate medical supplies. The introduction of fixed VMMC service delivery points will minimize the need for long-distance travel and improve service uptake, especially among men residing in remote areas.

5.4.3 Conduct Targeted Community Outreach in Hard-to-Reach Areas

Turkana County should prioritize mobile outreach programs to deliver VMMC services in underserved and hard-to-reach regions. The Department of Health should coordinate with partners such as AMREF Health Africa, Population Services Kenya (PS Kenya), and local NGOs to deploy mobile clinics staffed with trained health professionals. Outreach activities should be scheduled regularly and strategically aligned with community events and market days to maximize attendance and service uptake.

5.4.4 Engage Key Stakeholders to Address Low VMMC Coverage

To effectively address the below-target uptake of VMMC services—currently below the WHO-recommended 80% coverage for effective HIV prevention—the Ministry of Health (MoH), in partnership with Turkana County Government, should convene regular multi-stakeholder forums. These should include representatives from the National AIDS and STI Control Programme (NASCOP), donor agencies, health implementing partners, civil society, and community gatekeepers. Collaborative planning and resource mobilization will ensure that interventions are evidence-based, culturally sensitive, and aligned with local health priorities.

5.5 Suggestion for Further Studies

Further research should be conducted to explore the specific risk communication and community engagement (RCCE) gaps that deter the uptake of voluntary medical male circumcision in Turkana County. This includes evaluating the effectiveness of current RCCE strategies, identifying misconceptions and cultural barriers among target populations, and developing tailored communication interventions that resonate with different demographic groups, particularly young men and pastoralist communities.

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APPENDICES

Appendix I: Research Instruments

RE: DETERMINANTS OF VOLUNTARY MEDICAL MALE CIRCUMCISION (VMMC) UPTAKE IN TURKANA COUNTY

SECTION A: Demographic Factors

Instructions: TICK **(√)** appropriately.

1 How old are you?

i. 20-29 [ ]
ii. 30-99 [ ]
iii. 40-49 [ ]
iv. Over 50 [ ]

2. Which sub-county do you come from?

Turkana Central [ ]
Turkana North [ ]
Turkana South [ ]

3. What is your religion?

Christian [ ]
Tradition African religion [ ]
Muslim [ ]

4. What is your marital status?

Single [ ]
Married [ ]
Divorced [ ]
Widowed [ ]

5. What is your highest level of education attained?

No formal education [ ]
Primary [ ]
Secondary [ ]
Tertiary [ ]

6 What type of house do you live in?

Temporary [ ]
Semi-permanent [ ]
Permanent [ ]

7 What cultural rites do you still accept or participate in?

a) Wife inheritance [ ]
b) Ancestral veneration (e.g. Death anniversaries) [ ]
c) Turkana Cultural practice (Asapan) [ ]
d) Polygamy [ ]
e) Other (specify) _____

8 What is the size of your Family? (Tick one)

a) Less than 6 members [ ]
b) Between 6-10 members [ ]
c) More than 10 members [ ]

9 Do you freely share about VMMC?

Yes [ ] No [ ]

10 How far is the nearest VMMC facility from your place of residence? (Tick one)

a) Less than 4 km [ ]
b) 5 to 10 km [ ]
c) Beyond 10 km [ ]

SECTION B: Uptake of Voluntary Medical Male Circumcision services among men in Turkana County

1. i) Have you ever received Voluntary Medical Male Circumcision services?

a) Yes [ ] b) No [ ]

ii) If yes, which VMMC services did you receive?

a) Health Education on VMMC [ ]
b) Counselling on VMMC [ ]
c) HIV Pre-test and Post- test counselling [ ]
d) Circumcision [ ]
e) Post Circumcision follow up [ ]
f) All the above [ ]

iii) Where did you receive the service?

a) Health facility within the sub-county [ ]
b) Mosque [ ]
c) Health facility outside the sub-county [ ]

d) Home [ ]
d) Others
(Specify)……

2. Why did you seek VMMC services?
a) To know my HIV status ……
b) To prevent HIV ……..
c) Advised by health workers ……..
d) Encouraged by wife, colleagues, media …….
e) To seek medication for STIs…….
f) Others……..

3. i) Did you experience any complications during or after circumcision ?
a) Yes [ ] b) No [ ]

ii) If yes, which complication did you experience
a) Pain after circumcision [ ]
b) Bleeding during and, or after circumcision [ ]
c) Drug reaction [ ]
d) Swelling [ ]
e) Infection [ ]
f) Others
Specify……

4) Did the complication you experienced managed?
a) Yes [ ] b) No [ ]

SECTION C: Awareness towards the uptake of Voluntary Medical Male Circumcision services among men in Turkana County

1 i) Have you ever heard of Voluntary Medical Male Circumcision services?
a) Yes [ ] b) No [ ]

ii) If yes, where did you get the information from?
a) Health facility [ ]
b) Friend [ ]
c) Parent [ ]
d) Media /Radio/TV/Posters [ ]
e) Others
(Specify)……

iii) If yes, what is the importance of Voluntary Medical Male Circumcision services?

a) To prevent HIV [ ]
b) To prevent other STIs [ ]
c) For hygiene [ ]
d) For cultural purposes [ ]
e) Prestige [ ]
f) For religious purposes [ ]
g) To improve my sex performance [ ]
g) Others
(specify)……

2 i) Are you aware about where you can get Voluntary Medical Male Circumcision services?

a) Yes [ ] b) No [ ]

ii) Which places can you access VMMC services?

a) Health facility [ ]
b) Mosque [ ]
c) Schools [ ]
d) Sub County head Quarters [ ]
e) Others……

3 i) Are you aware about the age at which a male should be circumcised?

a) Yes [ ] b) No [ ]

ii) If yes, at what age should a male be circumcised?

a) Baby/child [ ]
b) Adolescence [ ]
c) Early adulthood [ ]
d) Late adulthood [ ]
e) Any age [ ]

4 Does Voluntary Medical Male Circumcision services reduce sexual pleasure?

a) Yes [ ] b) No [ ]

5. Do you know the hygiene benefits of Voluntary Medical Male Circumcision?

a) Yes [ ] b) No [ ]

6. What care should males who have been circumcised be given?

a) Special diet [ ]
b) Daily wound dressing [ ]
c) Admitted in the health facility [ ]
d) Swallow antibiotics and pain killers daily [ ]
e) Others……

7. What is the expected duration a male who underwent Voluntary Medical Male Circumcision takes to heal?

a) Less than 4 to 6 weeks [ ]
b) Between 4 to 6 weeks [ ]
c)More than 4 to 6weeks [ ]

8. Does the health facility near your home provide information about Voluntary Medical Male Circumcision?

a) Yes [ ] b) No [ ]

SECTION D: Influence of Accessibility to uptake of Voluntary Medical Male Circumcision services

1 i) Are Voluntary Medical Male circumcision services offered in health facilities in your Sub County ?

a) Yes [ ] b) No [ ]

ii) If yes, which health facility/facilities provide(s) VMMC services in your sub-county?

a)……
b)……
c)…….
d)…….

iii) What is the distance between your home and health facility?

a) Less than a kilometer [ ]
b) Between 1 and 3 km [ ]
c) Between 4 and 6 km [ ]
d) Between 7 and 10 km [ ]
e) More than 10 km [ ]

2. Does the health facility near your home have enough materials for health care services?

a) Yes [ ] b) No [ ]

3. Does the health facility near your home have enough health care providers?

a) Yes [ ] b) No [ ]

4 Are Voluntary Medical Male circumcision free of charge

a) Yes [ ] b) No [ ]

5 i) Do you pay for the VMMC services ?

a) Yes [ ] b) No [ ]

ii) If yes, how much in Kenya shillings?

a) Less than 500 [ ]
b) More than 500 [ ]
c) Other, specify…….

6. i) Are there barriers related to healthcare workers affecting access to VMMC services ?

a) Yes [ ] b) No [ ]

ii) If yes, explain…….

SECTION E: Influence of Social Cultural factors on uptake of Voluntary Medical Male Circumcision services

1. i) Are VMMC services culturally accepted in your community ?

a) Yes [ ] b) No [ ]

ii) If no, please explain why…….

2. i) Is there discrimination associated with circumscision in your community?

a) Yes [ ] b) No [ ]

ii) If yes, please explain…….

3.) How are the circumscised individuals regarded in your community?

4. i) Do you need to seek permission from anyone to get circumscised?

a) Yes [ ] b) No [ ]

ii) If yes, please explain…….

5. i) Does one require special diet after circumscision?

a) Yes [ ] b) No [ ]

ii) If yes, please explain…….

Appendix II: Interview Schedule for Key Informants

1. Can you briefly describe your role and responsibilities as a health officer in regards to VMMC implementation in Turkana County?

……
……
……..

2. What specific VMMC services or information have you personally been involved in delivering to the target population in Turkana County?

   ……
   ……
   ……....

3. Can you describe any specific strategies or campaigns that have been used to raise awareness about VMMC services among men aged 20-49 years in Turkana County?

   ……
   ……
   …….....

4. In your experience, which challenges do men aged 20-49 years commonly face when accessing VMMC facilities in Turkana County?

   ……
   ……
   ……

5. Have you observed any specific social-cultural practices within the Turkana community that encourage or discourage men aged 20-49 years from undergoing VMMC?

   ……
   ……
   ……..

6. Based on your experience, please explain specific taboos or cultural norms within the Turkana community that discourage men aged 20-49 years from considering VMMC as an option?

   ……
   ……
   ……

7. Based on your observation, please explain any changes in social-cultural attitudes and practices regarding VMMC in recent years. Please share notable effects on VMMC uptake?

……
……
…….

8. Kindly explain any ongoing community engagement or sensitization efforts aimed at addressing these social-cultural factors and promoting VMMC uptake in Turkana County?

   ……
   ……
   ……

9. Please explain VMMC implementation strategies that are utilized in Turkana County to help improve access and utilization of VMMC services in Turkana County.

   ……
   ……
   ……

Appendix III: Informed Consent

RE: DETERMINANTS OF VOLUNTARY MEDICAL MALE CIRCUMCISION (VMMC) UPTAKE IN TURKANA COUNTY:

I am a Masters student at the Mount Kenya University. As part of the requirement of Master's Degree in Masters in Public Health, I am conducting research for my project on the above subject as a requirement for the course. The information you give would be strictly confidential and would only be used for purposes of this study. Your participation is highly appreciated.

Thank you

JOSEPH NGIKIENY EKUAM

Appendix IV: Participant's Consent

Research Title: Determinants of Voluntary Medical Male Circumcision (VMMC) uptake In Turkana County.

Researcher Name: JOSEPH NGIKIENY EKUAM

I …….. Agree to participate in this study. The purpose and nature of the research work has been explained to me and I understand what my participation would involve.

I understand that even if I agree to partake now, I can withdraw at any time or refuse to answer any question without consequences of any kind.

I apprehend that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material would be withdrawn.

I agree that my participation would remain anonymous YES [ ] NO [ ].

I agree that the researcher may use anonymous speech marks in his research report YES [ ] NO [ ].

I agree that the interview may be audio and video recorded YES [ ] NO [ ].

I agree that the researcher may take photos of me YES [ ] NO [ ]

I agree that the information I provide may be used anonymously by other researchers following this study YES [ ] NO [ ]

(Signature)…….

(Name of participant)……..

(Date)……

Principal researcher: Sign …….date……...

Contacts In case you have any questions regarding the study, contact Joseph Ekuam; the Principal investigator - Tel no: 0722475623

Appendix V: Consent Form

Written consent form.

Name of the researcher:

Research topic: Determinants of uptake of VMMC services among men in Turkana County

Introduction and aim of the study

Joseph Ekuam is my name, a student at MKU, doing research on Determinants of uptake of VMMC services among men in Turkana County. This research is purely academic.

Voluntary participation and Withdrawal from the research

The decision to participate in this study is completely voluntary and you have a right to withdraw your participation at any time without repercussions.

Potential benefits

You may not get a direct benefit from being a part of this study, but the information obtained from this study may help in understanding underlying factors inhibiting VMMC uptake in Turkana County.

Potential risk and discomfort

You might be uncomfortable responding to some of the sensitive questions, in such a case, you may choose not to respond to a given question.

Confidentiality and anonymity

Information collected would be used for the intended purpose as explained in the introduction and purpose of the study. I would not include any information that would identify you like your name.

Contact Information

In case you have any queries regarding this study, you can ask me now or anytime during the study. You can also call me at +254 722475623 or email me at ngikieny@yahoo.com If you have any question on how your information would be kept confidential in this research or if you have been placed at risk, you can contact the Mount Kenya University, Institutional Ethical Review Committee (IERC) office at rsearch@mku.ac.ke.

Participant statement

The purpose of the research, potential benefits, and risks have been clarified by a researcher. I understand, my participation is purely voluntary and I have the right to withdraw my participation at any time. The queries I had concerning this research have been answered by

the researcher and I am aware that, all information I provided would be kept confidential. I willingly decide to participate in the research.

☐ **Yes**

☐ **No**

Researcher statement

I have clarified the aim of this research to the participant in the language the participant is conversant with.

Participant Signature /Thumbprint

……. Date ……

Researcher Signature

…… Date ……

Appendix VI: Mount Kenya University Ethical Clearance Certificate

Mount Kenya University

REF: **MKU/ISERC/3164** Date: 28 September 2023

TO: **JOSEPH NGIKIENY EKUAM**

REG: **MPH/L/0614**

Dear Sir/Madam,

RE: DETERMINANTS OF VOLUNTARY MEDICAL MALE CIRCUMCISION UPTAKE IN TURKANA COUNTY, KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2208.** The approval period is **28/09/2023 - 27/09/2024.**

This approval is subject to compliance with the following requirements;

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

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

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Yours sincerely,

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

Appendix VII: Mount Kenya University Letter of Introduction

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPH/L/0614

29th September, 2023

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: JOSEPH NGIKIENY EKUAM – REGISTRATION NO. MPH/L/0614

The purpose of this letter is to introduce the above named student who is pursuing **Master of Public Health** in the department of **Epidemiology and Biostatistics** in the school of **Public Health.**

The title of the research is **"Determinants of Voluntary Medical Male Circumcision Uptake in Turkana County, Kenya."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **October, 2023 and December, 2023.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P.O. Box 342-01000, THIKA
Office of the Director,
Graduate Studies

Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.

Appendix VIII: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **295643**

Date of Issue: **06/October/2023**

RESEARCH LICENSE

This is to Certify that Mr.. Joseph Ngikieny Ekuam of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Turkana on the topic: DETERMINANTS OF VOLUNTARY MEDICAL MALE CIRCUMCISION UPTAKE IN TURKANA COUNTY, KENYA for the period ending : 06/October/2024.

License No: **NACOSTI/P/23/30214**

295643

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

Appendix IX: Field Entry Authorization

REPUBLIC OF KENYA
TURKANA COUNTY GOVERNMENT

MINISTRY OF HEALTH SERVICES AND SANITATION

Director Preventive and Promotive Health,
Turkana County,
P.O Box 11 – 30500, Lodwar

Located at the Ministry of
Housing Building – Nawoitorong

When replying please quote...

13th October 2023

To whom it may concern:

REF: RESEARCH AUTHORIZATION FOR MR. JOSEPH NGIKIENY EKUAM

(LICENSE NO. NACOSTI/P/23/30214

This is to confirm that the above-mentioned person who is a student of Mount Kenya University has been authorized to carry out research on ***"Determinants of voluntary medical male circumcision uptake in Turkana County, Kenya"*** as per reference no. NACOSTI/P/23/30214 dated 6th October 2023.

Any assistance accorded to him will be highly appreciated. Thanks in advance.

Thanks in advance.

Alfred Emaniman
COUNTY DIRECTOR FOR PREVENTIVE AND PROMOTIVE HEALTH

Cc

All Directors Health
Turkana County

All Sub County Medical Officer of Health
Turkana County

Director General
NACOSTI

Appendix X: Similarity Index Report

Ekuam Joseph

DETERMINANTS OF VOLUNTARY MEDICAL MALE CIRCUMCISION UPTAKE IN TURKANA COUNTY, KENYA

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Mount Kenya University

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Appendix XI: Map of Turkana County Sub-Counties