F associated with uptake of infant male circumcision in Mufindi district

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FACTORS ASSOCIATED WITH UPTAKE OF INFANT MALE CIRCUMCISION IN MUFINDI DISTRICT

By

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A Dissertation Submitted in (Partial) Fulfilment of the Requirement for the Degree of Master of Public Health

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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled: **''Factors associated with uptake of infant male circumcision in Mufindi District'',** in (partial) fulfillment of the requirements for the Degree of Master of Public Health of Muhimbili University of Health and Allied Sciences.

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Prof. Method Kazaura

(Supervisor)

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Date

DECLARATION AND COPYRIGHT

I, **Dr. Innocent Kasmir Mhagama**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

Signature…… **Date**…….....

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I first would like to thank the almighty God for his blessings throughout the period of my studies. I appreciate the support I have received from different people and institutions that have made my studies possible.

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A special gratitude also goes to friends and colleagues who contributed towards the success of this project. Your encouragement and help will not be forgotten.

DEDICATION

This work is dedicated to my son Brian Innocent Mhagama who has been a motivation for me to work hard each and every day, and a constant reminder for me to achieve more.

ABSTRACT

Background

Studies on male circumcision have provided evidence on its efficacy for partial protection against heterosexual HIV transmission in circumcised men. WHO and UNAIDS formulated recommendations to incorporate male circumcision in HIV prevention programs, which included implementation of infant male circumcision. Iringa been exposed to information on adopting male circumcision, and targets for adults circumcision have been met. However, the uptake of infant male circumcision was low delaying the catch up with adult circumcision. This raised the need to understand the factors influencing the uptake.

Objective: The objective of this study was to determine the factors associated with uptake of circumcision among infants of parents attending RCH clinic in Mufindi District

Methodology: This was analytical cross section study. A sample of 664 parent-baby pairs were systematically selected at RCH clinics in three health facilities that provided RCH and IMC services in Mufindi District. Data was collected through scheduled interviews.

We performed univariate analysis for descriptive measures, bivariate and multivariate analysis to determine association between infant circumcision and independent variables. The outcomes were reported as odds ratios (OR) and their associated 95% confidence intervals

Results: The proportion of IMC in Mufindi district was found to be 43.2 %. Attitude was found to be positive in 61% of the participants and found to be the factor for uptake by 66.1% (95% CI 0.02, 0.75, P 0.034). Non uptake was associated with fear of complications in 17.5% and other respondents 45.1% thought infants are too young for the procedure.

Conclusion: The study findings show that IMC uptake is associated with attitude of the parents on IMC. The other factors are religion, nature of economic activities. Hygiene and protection against HIV infection were the main reasons for circumcision, and fear of complications and young age were the main factors for non uptake. The parents preferred circumcision to be conducted after infancy.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
EIMC	Early Infant Male Circumcision
HIV	Human Immunodeficiency Virus
IEC	Information, Education and Communication
IMC	Infant Male Circumcision
MC	Male Circumcision
OR	Odds Ratio
RCH	Reproductive and Child Health
STI	Sexually Transmitted Infection
UNAIDS	United Nations Program on HIV/AIDS
VMMC	Voluntary Medical Male Circumcision
WHO	World Health Organization

OPERATIONAL DEFINITIONS OF TERMS

Infant Male Circumcision (IMC): A medical male circumcision performed on a male newborn child younger than one year of age.

Male Circumcision: Is surgical removal of the foreskin - the retractable fold of tissue that covers the head of the penis.

Circumcision uptake: Having a circumcised male infant

Parent-Baby pair: A parent and his/her male infant.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Male circumcision is one of the oldest surgical procedures known. Traditionally, MC has been undertaken as a mark of cultural identity, religious rite, and other health related reasons. The earliest records depicting the practice on male circumcision come from Egyptian tomb work and paintings dating as far back as 2300 BC. Advances in surgery in the 19th century and increased people mobility in the 20th century introduced the procedure into some previously non-circumcising cultures for religious, health and social reasons [1].

Male circumcision has gained international focus as a result of increasing compelling evidence of its medical and non-medical benefits from numerous studies. The identified medical benefits of male circumcision include reduced risk of acquiring sexually transmitted infections, protection against heterosexually transmitted HIV, urinary tract infections, inflammatory dermatoses, penile cancer, STIs and cervical cancer in women partners. Other benefits include prevention of phimosis, paraphimosis and improved penile hygiene [2].

The possible link between HIV and non-circumcision was first hypothesized in 1986, the same year HIV was officially labeled as the etiologic agent of AIDS. Ecological studies have found that populations with the highest HIV prevalence are those in which small proportions of men were circumcised [3]. A meta-analysis of 27 observational studies from sub-Saharan Africa published in 2,000 demonstrated a 58% protective effect of circumcision in males [4].

The conclusive evidence of the protective effect of male circumcision against HIV come from three randomized controlled trials conducted in Kisumu Kenya [3], Rakai District Uganda [5] and Orange Farm South Africa [6]. These trials unequivocally indicated that male circumcision reduces the risk of heterosexually acquired HIV infection in men by approximately 60%. Longer-term follow up of circumcised candidates suggests that this protective effect persists beyond 24 months [3].

In March 2007, the World Health Organization (WHO) and the Joint United Nations Program on HIV/AIDS (UNAIDS) issued a recommendation to countries with high HIV prevalence, and low male circumcision rates to incorporate VMMC in comprehensive HIV prevention programs. These included the recommendations that male circumcision should always be considered as part of a comprehensive HIV prevention package which includes among other initiatives, promoting abstinence, condom use, encouraging the reduction in the number of sexual partners, and providing HIV testing and counseling services [8].

In order to ensure that the HIV prevention benefits of male circumcision are sustained in the longer-term, WHO/UNAIDS also recommended the implementation of infant male circumcision alongside adult voluntary medical male circumcision. This recommendation was with presumption that; high uptake of IMC will entirely phase out the "catch up" of adult voluntary medical male circumcision as circumcised infants come of age [8].

Biologically there are at least three ways by which the male foreskin increases the risk of HIV acquisition. Firstly, uncircumcised men are at increased risk of abrasions which facilitate HIV entry. Secondly, uncircumcised men are more susceptible to STIs, including ulcerative ones (e.g. herpes simplex virus type 2, syphilis) which facilitate HIV acquisition. Thirdly, the inner surface of the foreskin mucosa contains HIV-1 target cells (CD4+ T cells, macrophages, and Langerhans cells). The HIV target cells in the inner foreskin are closer to the surface than those situated elsewhere on the penis, due to the lack of skin keratinization. If the foreskin is removed, so is a large area of highly vulnerable mucosa [8].

In Africa, male circumcision is almost universal in North Africa and most of West Africa but is less common in Southern Africa [9]. Prior to voluntary medical male circumcision (VMMC) scale-up, male circumcision prevalence ranged from 0 to 30% in most parts of Southern Africa and MC was mostly practiced for cultural and religious reasons [10].

Tanzania had an overall circumcision prevalence of 67%, while Iringa region had circumcision prevalence of 29% of all male adults [11]. In the rollout phase, VMMC in Tanzania was first piloted in 2009 in Iringa region targeting adolescents 10+ years and adults.

Iringa was also the most affected region by HIV, with the adult prevalence of 15.7%. By 2014, more than 272,740 clients were circumcised, leading to an increase in adult male circumcision prevalence from 29 to 60% [11].

In order to sustain VMMC coverage over the long term, it is required to circumcise either adolescents, or infants, or both. Modeling has projected that rolling out infant male circumcision from 2013 through 2050 in Tanzania could avert 2% of all HIV infections and decrease overall HIV-related costs by 7% [11].

While MC can be performed at any age, the ease with which circumcision can be performed in infancy makes this time of life preferable, compared to intervention later in childhood or in adulthood. In general, the benefits of conducting male circumcision during the infant period rather than among adolescents or adults are well-documented. They include faster-wound healing, usually within a week [12], and when surgical devices are used, they eliminate the need for sutures and significantly reduces bleeding [13, 14]. Other benefits of infant male circumcision compared to adult male circumcision include fewer surgical errors, infections, and postoperative complications. Kariher DH et al 1995 conducted a systematic review in 2010 and reported a 1.5% complication rate for medical male circumcision performed on infants and 6% for that on older children showing lesser complication in infants [14]. The complications are usually minor and easily resolved. Moreover, compared to adolescent and adult VMMC, infant male circumcision is quicker and easier to perform [8].

Within the context of HIV prevention, infant male circumcision has the added advantage that it takes place before the individual becomes sexually active. This avoids the possibility of resuming sex prior to complete wound healing and the associated risk of HIV acquisition or transmission. Resumption of sexual activity before the recommended post-circumcision abstinence period (six weeks) is a major issue with older men. Hewett PC et al 2012 in Zambia found that 24% of circumcised men reported resuming sex earlier than six weeks. Of these, 46% had sex during the first three weeks and of these, 82% reported at least one unprotected sex act, and 37% reported sex with two or more partners [10, 14].

Since 2009, Tanzania has provided voluntary medical male circumcision to adult and adolescents aged 10 years and above through a collaborative effort between the government and technical agencies. In 2013, a pilot roll-out of IMC was conducted, yet wide IMC for HIV prevention is not yet widely available in the region. Since then the uptake of IMC has been less than 20% [15]. This study aims at finding out the factors associated with uptake of infant male circumcision (IMC) for HIV prevention among parents attending RCH Clinic in Mufindi District. Furthermore, the insights may be extrapolated to the evaluation of similar interventions elsewhere.

1.2 Problem statement

Male circumcision (MC) has been shown to be effective against heterosexual acquisition of HIV infection and is being scaled up. The Government and stakeholders have worked to scale up and integrate Infant Male Circumcision (IMC) into reproductive and child health services in regions with high HIV prevalence and low circumcision prevalence, including Iringa region. The government and stakeholders have mobilized resources, conducted training to health care providers and peer educators, and used referrals from labor wards in health facilities to reach more infants.

Despite this fact, the uptake of infant male circumcision in Iringa health facilities compared to facility births is less than 20% [15], which is too low to meet and sustain the high proportion of circumcised male needed to control the HIV epidemic. Before role out of the service, studies found high acceptance of IMC by both circumcising and non-circumcising communities. [15] Therefore it is not clear why the uptake is still very low. The purpose of this study is to determine factors associated with uptake of infant male circumcision (IMC) for HIV prevention among parents attending RCH Clinics in Mufindi District.

1.3 Conceptual Framework

INDEPENDENT VARIABLES **DEPENDENT VARIABLE**

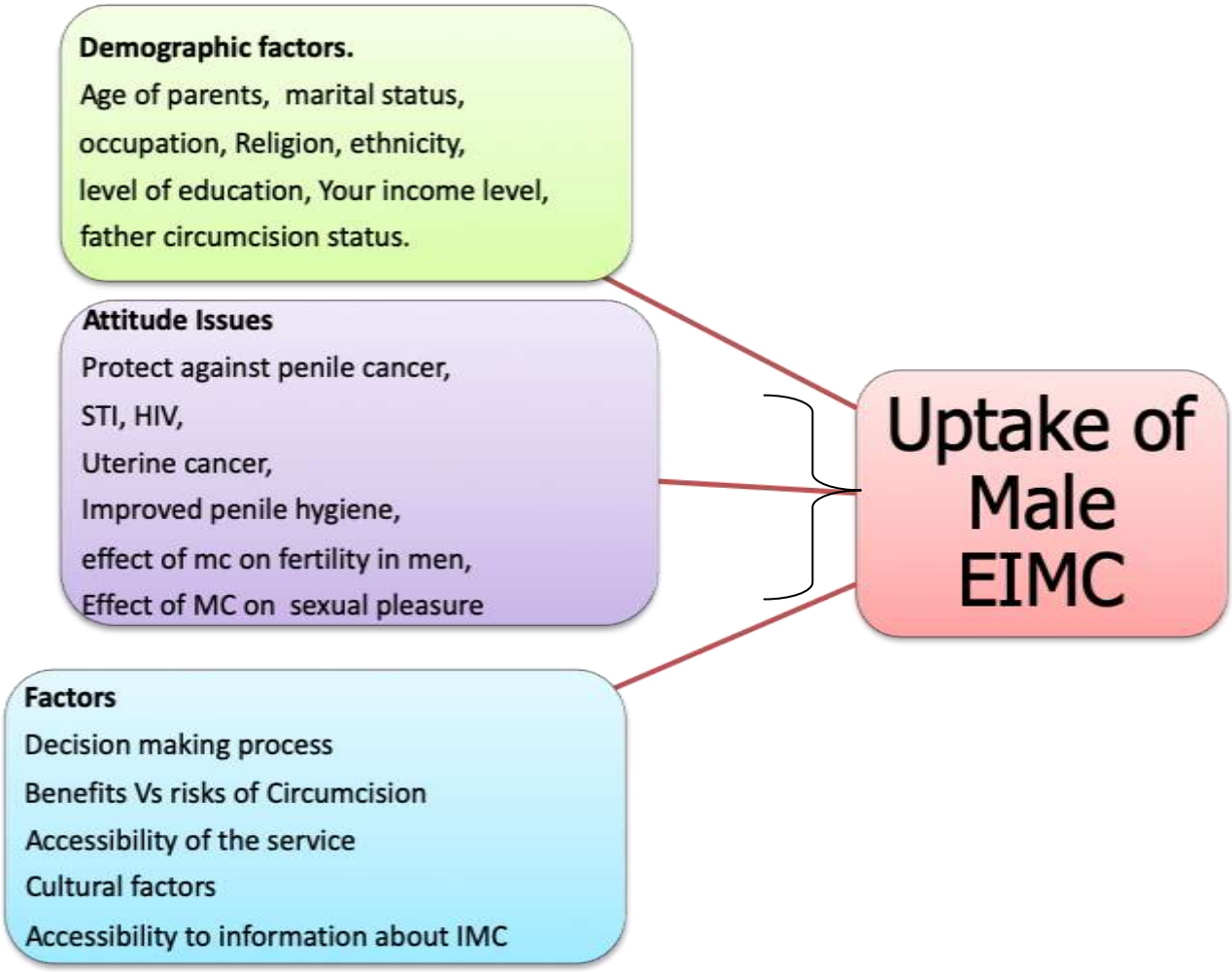

Figure 1: Factors associated with uptake of infant circumcision (Adapted from Adhikari, Soonthorndhada and Prasartkul, 2009)

Description of the conceptual framework

The conceptual framework is based on the theory of planned behavior and literature review. As postulated by Ajzen & Fishbein, 1980, the theory of planned behavior states that attitude toward behavior, subjective norms, and perceived behavioral control, together shape an individual's behavioral intentions and behaviors. According to this theory, if people evaluate

the suggested behavior as positive (attitude), and if they think their significant others want them to perform the behavior (subjective norm), this results in a higher intention (motivations) and they are more likely to do so**.**

In this research, there are two variables which are dependent variable, and independent variables. As per conceptual framework illustrated above, Infant male circumcision uptake (dependent variable) among parents attending RCH clinics is a result of background factors, attitude on Circumcision and factors such as cultural factors, accessibility of service, decision making process, perception of benefits and risks of the surgical procedure and exposure to information about male circumcision services.

It is conceptualized that the social factors and demographic factors such as marital status, education level, economic level and age of the parents influence the decision and actual uptake of the services. The parent perceptions on the risk of the circumcision procedure to an infant against the benefits of the circumcision, perception on how male circumcision affects the development of genital organs and perceived sexual pleasure after circumcision, are the other factors as well as facilitators of infant male circumcision. These factors intervene with one another and influence the uptake of Infant circumcisions.

The statistical association between independent variables and independent variables needs to be explained. The presence of one independent variable such as age of the parents does not necessarily lead to the uptake of Infant circumcision service. This study concentrated on the significance of each variable in the uptake of infant circumcision logical explanation of the association.

1.4 Rationale

The study contributes knowledge in understanding the factors that are associated with uptake of infant male circumcision in Mufindi District, a traditionally non-circumcising community with high HIV prevalence of 11.3%.

The knowledge acquired through this study informs and assists the Regional Medical Officer, District Medical Officers, the health facility management, development partners and stake holders in the fight against HIV on best ways to guide and implement infant male circumcision intervention in their areas.

Also, beneficiaries of data from this study are different stakeholders in different health programs focusing on HIV prevention interventions. These programs may revise or set up evidence-based programs that maximize the uptake of infant male circumcision as an additional intervention for HIV prevention.

1.5 Research questions

1.5.1 Main research question

What are the factors associated with uptake of infant male circumcision among parents attending RCH Clinic in Mufindi District?

1.5.2 Sub research questions

1. What is the proportion of uptake of infant male circumcision among infants of parents attending RCH clinic in Mufindi District?
2. What is the attitude on infant male circumcision among parents attending RCH clinic in Mufindi District?
3. What are the factors associated with uptake to infant male circumcision among parents attending RCH Clinic in Mufindi District?
4. What are the reasons for circumcision practices among parents of infants in Mufindi District?

1.6 Objectives

1.6.1 Broad Objective

To assess factors associated with uptake of infant male circumcision among parents attending RCH clinic in Mufindi District.

1.6.2 Specific Objectives

1. To determine the proportion of circumcision among infants brought at RCH Clinic in Mufindi District.
2. To determine the attitude on infant male circumcision among of parents attending RCH clinic in Mufindi District.
3. To determine factors associated with uptake to infant male circumcision among parents attending RCH Clinic in Mufindi District.
4. To describe reasons of circumcision practices among parents of infants in Mufindi District.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Proportion of uptake

The proportion of males who are circumcised and the age at which they are circumcised are determinants of how rapidly the male circumcision for HIV prevention intervention will result in the reduction of HIV prevalence in the population. If infant circumcision is acceptable by the parents, it will serve as a catch-up strategy to a widely implemented adolescent and adult circumcision, and then the time lag from introduction of a large-scale intervention until observable reductions in HIV prevalence could be significantly reduced. Uptake of Infant male circumcision in traditionally non-circumcising communities is crucial to the success of a MC intervention for reducing HIV prevalence. This review provides an extant literature on proportion of uptake, Factors associated with uptake and attitude on Infant male circumcision.

Plank RM et al in their systematic review, found that greater proportion of men and women prefer adolescent circumcision to infant circumcision, with the exception of Botswana, where one study showed 55% to 63% of adults preferred circumcision to be performed on infants or young children and another study showed 81% of postpartum mothers of male infants felt the best time to circumcise was within the first year of life [16].

Acceptability studies conducted in Southern Africa have uncovered strong support for male circumcision among parents for having their sons circumcised, but this has not translated to high uptake of infant male circumcision. In a study conducted in Zambia, it was found that 97% of the parents are willing to have their male infants circumcised, but only 11 % of their newborn sons went for Infant circumcision with significant predictors for uptake of Infant male circumcisions being older maternal age (mothers age above 36yrs) and older paternal age (fathers age between 25yrs to 35 years) [8]. However, the acceptance reported in this study did not reflect the actual uptake of the service as it was measured before the services were offered under assumption that those who accepted would take their infants for circumcision, which is not necessarily the case.

Most acceptability studies were conducted before IMC services were offered. In actual practice, there is a gap between the perceived acceptability of the practice and the rate of uptake. Asking whether parent might prefer to be circumcised under various hypothetical scenarios (e.g., if it is found to reduce risk of HIV acquisition; or if it is at minimal cost and safe) is one means of assessing acceptability. However, this does not translate to actual uptake. A more realistic means is to discover where infant male circumcision services are available and see who takes advantage of the services and gets circumcised [17], to the best of this literature search, none such study has been conducted to assess the actual uptake of infant circumcision and thus the proportion of circumcised infants in Tanzania. Therefore, the proportion of male infants getting circumcised is not known. This study intends to determine the actual uptake by finding out who really did seek the service and who didn't. This approach permits assessment of proportion seeking the services, and the ages and population segments that respond as well as factors that inhibit or facilitate uptake of the services [14]. This study intends to assess the proportional of uptake of IMC by parents by using the actual utilization of the services.

2.2 Attitude on Infant Male Circumcision

The attitude of the parents on infant circumcision is a significant contributor to uptake or non-uptake of the service. Studies conducted in Zambia and Zimbabwe have found that respondents who agree that male circumcision is a method of HIV prevention and offered protection against infection (HIV and other sexually transmitted infections), and improved cleanliness were more likely to circumcise their baby boys. Sgaier, S. K et al, (2017) found that for those who had concerns with male circumcision, the top reasons cited included belief that the infant is too fragile and young for the procedure, the needs for after-care are too much, the quality of the procedure (i.e., something could go wrong or the procedure might not be done properly), the pain may be too much for the child, and it could lead to death. The respondents had difficulty visualizing the skin being removed from the small penis and hence difficulty in understanding the procedure [18, 21].

In another study conducted in Western Kenya, parents who choose to circumcise their Infants agreed that circumcision protected them against diseases and improved penile hygiene. They also found that pain and perceived health risks to the infant, including bleeding, swelling, infection, and penile damage, are the major barriers reported by those declining IMC services [19].

Wester camp & Bailey, 2007 suggested that, though it is not well understood what motivates members of traditionally non-circumcising communities to seek MC services, the knowledge of the circumcision procedure, the benefits and attitude of the society, its associated risks and socio-cultural aspects are likely to influence the decision to accept circumcision. Studies from areas in East and southern Africa where male circumcision (at any age) is not traditionally practiced, report levels of acceptability for MC of 75% under the conditions that the community agreed that MC was protective against HIV acquisition, and that it is offered safely and affordably [20, 21, 22]. However, it is not known to what extent attitude influences the uptake of male circumcision in Tanzania, especially in traditionally not circumcising societies in southern Highlands. This study intends to find out the influence of attitude on male circumcision and the actual uptake of the procedure.

2.3 Factors associated with uptake of Infant circumcision

Across studies, different factors have been identified as barriers and facilitators to Infant circumcision. Bailey et al., 2002, Identified infants are considered to too fragile and pain was one of the barrier for IMC. The apprehension about pain during and after the procedure was reported to be the major barrier to MC acceptability in most studies. The other factor that has been identified as barrier is the cost of the procedure [3, 20].

In another study conducted in Botswana, Kebaabetswe et al., 2003, in both Botswana and Swaziland identified Culture and Religion as barriers. Lack of circumcision was mentioned as an element of the ethnic identity of those who do not circumcise traditionally. However, remaining with one’s foreskin is not considered crucial to one’s own ethnic identity. It serves as an ethnic marker primarily used by others [21].

Complications and adverse effects were also identified as factors that served as barriers to male circumcision. If parents believe that circumcision lead to high rate of complications, then uptake of male circumcision will be slow. Concerns for safety are universal in different studies. Mothers have been found to be vocal in their concerns, especially in cases of infant and early childhood circumcision [27].

The other factor identified as a barrier is potential for behavioral disinhibition. Bailey et al., 2002; Rain-Taljaard et al., 2003 in South Africa and in Nyanza Province, Kenya respectively identify that males who believe that circumcision offers protection from HIV infection, are less inhibited in their sexual activities and engage in higher HIV risk behaviors, thereby mitigating a partially protective effect of MC. However, the perception that male circumcision provides full protection against HIV and STIs was found to be generally rare, although expressed by few participating clients [3, 27].

The factors identified as facilitators for MC acceptability are improved penile hygiene, which is universally recognized as being extremely important and is viewed as a major benefit of circumcision. Bailey et al., 2002; identified other facilitators including protection from STIs and HIV and perceived increase in sexual pleasure among circumcised versus uncircumcised. Studies show that, how circumcision is perceived to influence sexual drive, sexual performance, and sexual pleasure for the man himself or for his partner influences the decision making around MC [3, 22].

A study on actual infant circumcision acceptability conducted in Kenya reports that the circumcision status of the infant's father is associated with increased likelihood of infant circumcision adoption [27]. The findings suggest that as adult VMMC becomes more prevalent, demand for IMC also to increases. Consequently, men who undergo VMMC need to be sensitized on both the availability and comparative advantages of EIMC [22]. This study intends to uncover whether this is the case Mufindi, Iringa, where voluntary medical male circumcision for adolescents and adults has been conducted for the past seven years.

Other findings support the notion that cultural beliefs are integral to successful MC provision some ethnic groups were concerned about handling and disposal of the removed foreskin. Secondly, some preferred circumcision to be performed by individuals of either the same tribe or religion. Thirdly, older Shangaan men strongly opposed IMC as they felt that it undermines their tradition by separating circumcision from adolescent initiation, in addition to allowing women (mothers) to nurse the wound, considered taboo [28]. Mufindi is inhabited by traditionally none circumcising ethnic groups, it not known as to what extent the cultural beliefs and traditions of these communities play a role in the decision about utilizing the male circumcision services. To the best of my literature search, currently there is no study has been conducted in Tanzania determine the factors for uptake of infant male circumcision after introduction of the services in the healthcare system.

2.4 Parents' reasons for male circumcision

Just as the prevalence of male circumcision varies around the world, the reasons for circumcision are equally diverse. A study conducted in Australia, found that the common reasons for newborn circumcision were hygiene, family tradition and medical reasons. The most common perceived benefit was hygiene while the most common concern was pain. They also found that as the number of boys a mother had who were already circumcised increased, the age at circumcision of the newborn boy became earlier [23].

In 1999, Jeffrey D et all found that most parents had made a decision on circumcision before physicians discuss it, and physician discussions appear to have little impact on the decision. Ease of cleanliness was the most common reason parents choose circumcision, other reasons being medical benefits of circumcision and religious requirement. Parents, who refused circumcision said they did not circumcise their children because of fear of pain to the child, some said it was unnecessary and others said the father of the child was uncircumcised [24].

In another study by Rediger c et al, 2013, reasons that parents gave for supporting circumcision of their children, were hygiene, prevention of infection, and the father being circumcised. When asked about the single most important factor for supporting male

circumcision, hygiene was most commonly reported. In the same study, the reasons most commonly reported by parents for not supporting circumcision were it not being medically necessary, the father being uncircumcised , and concerns about bleeding or infection [25].

A Tanzania study conducted to collect views of urban resident on male circumcision reported barriers to male circumcision among adults and children were: anticipation of pain, cost, fear to lose body parts, and lack of advice for adult's circumcision [26].

CHAPTER THREE

3.0METHODOLOGY

3.1 Study design

This is an analytical cross section study. The study design was chosen because it was meant to collect information at a point in time enough to get relevant information to answer the proposed objectives.

3.2 Study Area

The study was conducted in Mufindi district, one of four districts of the Iringa Region, southern highlands of Tanzania. Mufindi district is located 80 km south of Iringa Town, along the TANZAM highway. Other districts in Iringa region are Iringa Rural, Iringa Urban and Kilolo District. It is bordered by Njombe District to the south, Mbarali District to the west and Iringa District to the north. To the northeast lies Kilolo District. The headquarters is located at Mafinga Town along Mbeya Road.

The major tribal group is the Wahehe who constitute about 85 percent of the entire population, a traditionally none circumcising society. Their main activity is farming followed by a little livestock keeping. The Wabena, Wakinga, and others make up the remaining 15 percent. Mufindi District had the total population of 317,731 in 2012 census, with the average growth rate of 1.4%. The main economic activities of the people in Mufindi district are the agriculture activities which contribute 91% of the district GDP, the services and industry sectors accounting for 8% and 1% in Construction. Mufindi has a total of 94 health facilities of which 2 are Hospitals 14 Health Centers and 78 are dispensaries. The study setting is high volume RCH clinics that also provide infant circumcision services. These facilities are Mafinga Hospital, Kasanga Health Centre and Nyololo Health Centre.

3.3 Target Population

The Target population was parents of male infant (parent-baby pair) attending RCH clinic in Mufindi district.

3.4 Study Population

The study involved parent baby pairs attending RCH clinic in the three health facilities that provide IEMC services. These facilities are Mafinga Hospital, Nyololo Health center and Kasanga Health Centre

3.5 Inclusion and exclusion criteria

All Parent-baby pairs were included. A baby was any male infant less than one year old and weighing 2.5kg and above at birth and during the study which was determined by checking in their clinic cards was included. Parents with a baby who was found to be sick or having a contraindication to infant circumcision were excluded.

3.6 Sample size calculation

Sample size was calculated using the formula:

$n = Z^2 \times P (1 - P)*D/ E^2$

Where;

Z = Confidence level (Z = 1.96 for 95% CI)

P = 0.164 (Proportional of infants circumcision estimated to be about 16.4% [15]

D = The design effect estimated to be 2

E = Margin of error 4%.

Therefore, $n = 1.96^2 \times 0.164(1 - 0.164)/ 0.04^2 = 660$. Taking into account non-response rate of about, 10% 660+66=726 therefore, sample size was adjusted to 726 parent-baby pairs.

3.7 Sampling technique

The study utilized a cluster sampling technique. There are five health facilities (2 Hospitals and Three health centers) that provide both infant circumcision services and RCH services. Three facilities from these five with high attendances were selected. Based on registered number of attendances in each particular day, the required number of parent baby pairs was systematically selected. The parent who was available at the clinic was interviewed.

3.8 Variables and measurement

3.8.1The dependent variable

The dependent variable of interest in this study was the circumcision status of the index male child for each parent baby pair attending the RCH clinic on the day of the interview. The circumcision status was determined by the researcher through examining the index child with the consent of the parents.

3.8.2The independent variables

The study collected data on the following independent variables:

a) Attitude about Infant male circumcision

This variable was assessed and measured by ten statements regarding male circumcision. One statement about safety of infant male circumcision, asking how safe is the operation procedure whose responses were very safe, somehow safe, I don't know, somehow unsafe and not safe. There were also nine statements whose responses were strongly disagree, disagree, neutral, agree and strongly agree with the statements on male circumcision health benefits and sexual performance. These were measuring level of agreement or disagreement with statements on male circumcision protection against HIV, STI, penile cancer and uterine cancer, male circumcision improving penile hygiene, reducing fertility in men and not benefiting female in any way. The other statements were on sexual experience and asked respondents if male circumcision improved male sexual pleasure and if male circumcision reduced female sexual pleasure. Strongly agree and agree responses were classified as positive attitude, disagree and strongly disagree were classified as negative attitude and the undecided were characterized to be neutral. The assessment was done to determine the prevalence of a positive attitude and negative attitude. Prevalence of positive and negative attitude was determined among parents with circumcised infants and those with uncircumcised infant.

b) **Reasons for circumcision;**

Parental reasons for circumcising or not circumcising their sons were assessed. Parents were asked the reasons for their decision to circumcise or not to circumcise their sons.

c) Factors associated with Infant circumcision uptake

Demographic factors: These included the current age of the parent of the child, marital status of the parent, occupation of the parent, religion, tribe, education level and income of the household.

Exposure to information about infant circumcision services: This was assessed by asking four questions about exposure to infant male circumcision information via various media channels. The questions included whether the respondents had ever heard a service provider talk about IMC, whether had ever been visited by the health worker or peer educator and talked about Infant male circumcision, received any IEC material on Infant male circumcision and had heard any program or advertisement on radial or TV about male circumcision.

Social-cultural factors: These factors include decision-making process regarding infant male circumcision. In this, the respondents were asked about how they made their decision to circumcise or not to circumcise their index son, and whether they consulted anyone, and if they did, who did they consult. They were also asked who made the final decision to circumcise or not to circumcise the child. The other factor is the concern about the appropriate age for circumcision. The parents were asked what age they thought was appropriate for circumcision. Finally they were asked about the circumcision status of the father of the index child.

Other factors: The respondents were asked to state their main reason for deciding to circumcise or not to circumcise the index child.

3.9 Data collection process

The research assistants were given one day training on the objectives of the study before the data collection commences. The Data was collected by the principal investigator and six research assistants for a period of four weeks. All the eligible participants identified during this period were included until when the minimum sample was obtained. Data was collected from all the sampled parents by administering a questionnaire through scheduled interviews, the research assistants and principle investigator did oversee the completeness of the questionnaire.

3.10 Data collection tool

Data collection tool was adopted from a study by Mavhu w. et al 2011 and Maxwell R. et all 2014 [29, 30]. The interview forms were prepared in English and translated in Kiswahili language which is considered to be the best medium of communication. The back translation (Kiswahili to English) was made to make sure the meaning and content are maintained as in the Kiswahili version.

3.11 Pre-testing of tools

Pre-testing of the questionnaire was done at a different health facility (not included in the study) to make sure questions are clear and the flow is acceptable. Findings of the pretesting were used to revise the interview form.

3.12 Data management and analysis

Data collection tools included the structured questions and computer laptops. The Principal investigator collected all questionnaires on the same day from research assistants and checked them for completeness. Data entry was done on daily basis and cleaning was done after completion of data entry. Cleaning of data was done by double entry and random checks for errors. Data was analyzed using the SPSS software, STATA and Microsoft excel was used particularly for drawing charts.

3.13 Data analysis

Proportion of infant circumcision was determined by the frequency of circumcision status of the index child for every parent baby pair.

Factors that influence uptake and reasons for circumcision practices were assessed, which included; Demographic characteristics of the parents, exposure to infant male circumcision information via various media channels, peer educators and service providers, perceived appropriate age for male circumcision, the decision-making procedure (having consulted the spouse or significant other about IMC), reported circumcision status of the father of the infant, Perceived benefits, and risks

Chi square was used to determine the association between the dependent variables and each of the independent variables on the background information, attitude on infant circumcision, reasons for circumcision practices and factors for uptake of IMC variables towards male circumcision. An odds ratio was calculated to assess the likelihood of some factors that were found significant. Logistic regression was be used to assess the effect of independent factors to the dependent variable, eventually coming up with independent factors associated with uptake of infant circumcision. A p-value of less than 0.05 was used as a cut-off point for assessing statistical significance and 95% confidence intervals was used to assess the strength of the association. Data is presented in graphs, tables, and charts.

3.14 Ethical consideration

The research protocol was be submitted for ethical clearance to the MUHAS Senate Research and Publications Committee. Permission to conduct the study was sought from Iringa Regional Administrative Secretary, District Executive Director of Mafinga Town council and Mufindi District Councils and Medical Officer Incharge of a selected Hospital and Health Centers.

The research assistants were trained and oriented to the study objectives, procedures and respectful interaction with study participants throughout the study. Research assistants consisted of four nurses. Nurses were preferred because of their knowledge on infant circumcision, their ability to handle sensitive information as part of their professional and ethical conduct, and ability to interact with participants and allow participants to be more comfortable and confident to share their concerns and respond to the questions. These nurses also ensured that participation or non-participation of the candidates did not in any way affect the way participants received care at the clinic, and observed that the right of participants to withdrawal from participation at any stage of the research any time was guaranteed.

The principle investigator and the research assistant ensured that the respondents were free from coercion to participate or provide any information. Respondents were informed that they could stop to be interviewed at any time, ask any questions or concerns at any stage of the research and even withdraw from the research if they so wish. Without interference with the services they receive.

Every participant was informed that she had been asked to participate in the study because she was a parent of a male infant who was a candidate for circumcision, a service offered at the same facility she was attending, and that her participation was voluntary. They were also informed that if they agreed to participate in the study, they would be asked to fill a questionnaire with several questions enquiring on uptake of infant circumcision and they would have to sign informed consent forms

Participants were informed on the objectives of the study. They were also informed that the findings of the study would be used for research and academic purpose, and help inform facility managers and stakeholders to improve the quality of service offered and design relevant programs and interventions that take into considerations the findings and recommendations from the this research. Also, the study would add knowledge in literature for further research activities.

Each selected parent was informed that if she decided to participate, was interviewed in a separate private room with one research assistant to ensure privacy and confidentiality. Parents were asked for permission to examine the child, no child was examined without consent of the parents. The information collected was treated confidentially and no personal details such as names were used. Identification numbers or codes were documented to ensure that no information can be traced back to the participant. The research team compiled a report that contained the information from participants in this study and was used for research purposes only.

All communications were done in Kiswahili, the preferred language for communication that every participant was able to understand, while taking into consideration the culture and traditions of the participants. Participants were given contacts of the principle investigator and The Chairman of MUHAS Research and Publications Committee (Dr. Bruno Sunguya, Telephone number 0221503026 for questions/concerns about their participation.

Participants were informed that the information will be treated confidentially and anonymously and informed consent forms were signed by a parent who agreed to participate.

CHAPTER FOUR

4.0 RESULTS

4.1Background characteristics

The study comprised of 664 (participation rate of 91.6% of the original estimated sample size of 725 participants who were approached), 8.4% respondents did not fill the questionnaire, for undisclosed reasons.

The respondents were from three RCH clinics of Health facilities (Mafinga Hospital 29.5%, Nyololo Health Centre 45.9% and Kasanga Health Center 24.5%). A total of 197 fathers and 467 mothers were interviewed. The average age of the fathers was 32 with standard deviation of 6.7 years while that of the mothers was 27 years with standard deviation 6.0 years and the average age of the index male infants was 5.5 months with standard deviation of 3.7monts. Most of the respondents had completed primary education (42.6%) and 5.3% had no formal education. With regard to marital status of the parents, 75.3% were married, 19% were single parents 3% were widows and the rest were divorced. Religious affiliation of the respondents was 90.7% Christians and 6.9% Muslims and 2.4 had other religions. Most participants identified themselves as having medium economic level (61.6%) and 36.3% as having low economic level. Most of the respondents hard formal employment 49.8% (Table 4.1a and b)

Table 4.1a: Distribution of study participants by background characteristics (N=664)

Characteristics	Number (%)
Name of health facility	
Mafinga Hospital	196 (29.5)
Nyololo Health Centre	305 (45.9)
Kasanga Health Centre	163 (24.5)
Type of the respondent	
Father	197 (29.7)
Mother	467 (70.3)
Marital status of the respondent	
Single	126 (19.0)
Married/Cohabiting	500 (73.3)
Divorced	18 (2.7)
Widow	20 (3.0)
Education status	
No formal	35 (5.3)
Incomplete primary	69 (10.4)
Complete primary	283 (42.6)
Incomplete secondary	108 (16.3)
Complete secondary	137 (20.6)
Above secondary education	32 (2.7)
Religion	
Christian	602 (90.7)
Muslim	46 (6.9)
Other	16 (2.4)
Reported perceived level of income	
Low	241 (36.3)
Medium	409 (61.6)
High	14 (2.1)

Table 4.1b Distribution of study participants by background characteristics (N=664)

Characteristics	Number (%)
Main economic activity	
Small scale farming	44 (6.6)
Housewife	24 (3.6)
Petty business	192 (28.9)
Formal employment	331 (49.8)
Unemployed	73 (11.0)
Age group of the father (years)	
Below 21	9 (1.4)
21 – 25	101 (15.2)
26 – 30	195 (29.4)
31 – 35	156 (23.5)
36 – 40	93 (14.0)
Above 40	71 (10.7)
Unknown	39 (5.9)
Age group of the mother (years)	
Below 21	89 (13.4)
21 – 25	205 (30.9)
26 – 30	213 (32.1)
31 – 35	81 (12.2)
36 – 40	47 (7.1)
Above 40	18 (2.7)
Unknown	11 (1.7)
Reported circumcision status of the father	
Circumcised	583 (87.8)
Uncircumcised	67 (10.1)
Unknown	14 (2.1)

Exposure to information about Infant male Circumcision (n=664)

Among all study participants, 520 (93.3%) reported to currently be aware on the presence of male circumcision services for male infant. The main reported sources of information about IMC services were service providers 545 (82.0%), peer health care worker/community health worker 516 (77.7%) IEC materials 544 (81.9%) and 532(80.1%) got the information through radio and TV (Figure 4.1)

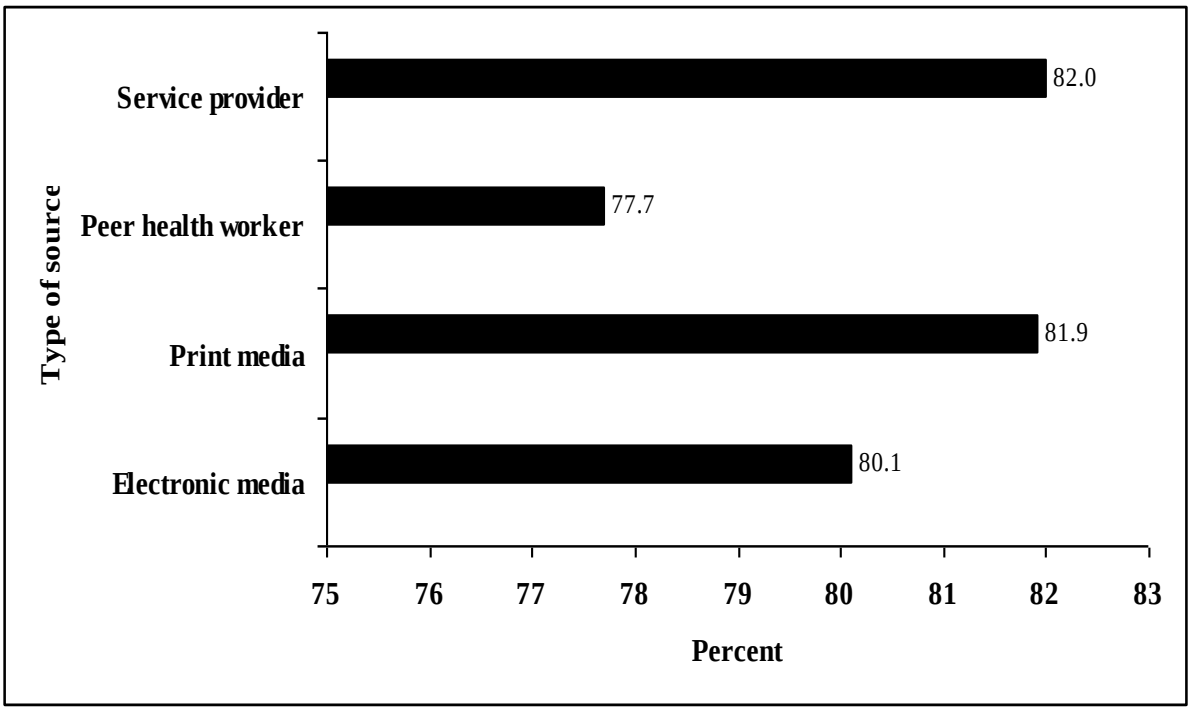

Figure 4.1: Source of Information on Infant male Circumcision (N=664)

Decision-making regarding circumcision

Decision making with regard to uptake of infant circumcision in the family is reported as being, collective responsibility both parents 228 (79.4%) for parents of circumcised infants and 232 (61.5%) for parents of uncircumcised infants) of the parents for both circumcise infants and uncircumcised infants. (Table 4.2a & 4.2b)

Table 4.2a Main decision-maker for parents to circumcise the son (N=287)

Decision-maker	Number (%)
Father	34 (11.8)
Mother	25 (8.7)
Both (father and mother)	228 (79.4)

Table 4.2b Main decision-maker for parents not to circumcise the son (N=377)

Decision-maker	Number (%)
Father	81 (21.5)
Mother	29 (7.7)
Both (father and mother)	232 (61.5)
Other (in laws, aunt, etc.)	35 (9.3)

4.2 Proportion of circumcision among infants brought at RCH Clinic

Of the 664 male infants who were attended during the period of the study, 287(43%) were circumcised and 377 (57%) were not circumcised (figure 4.2)

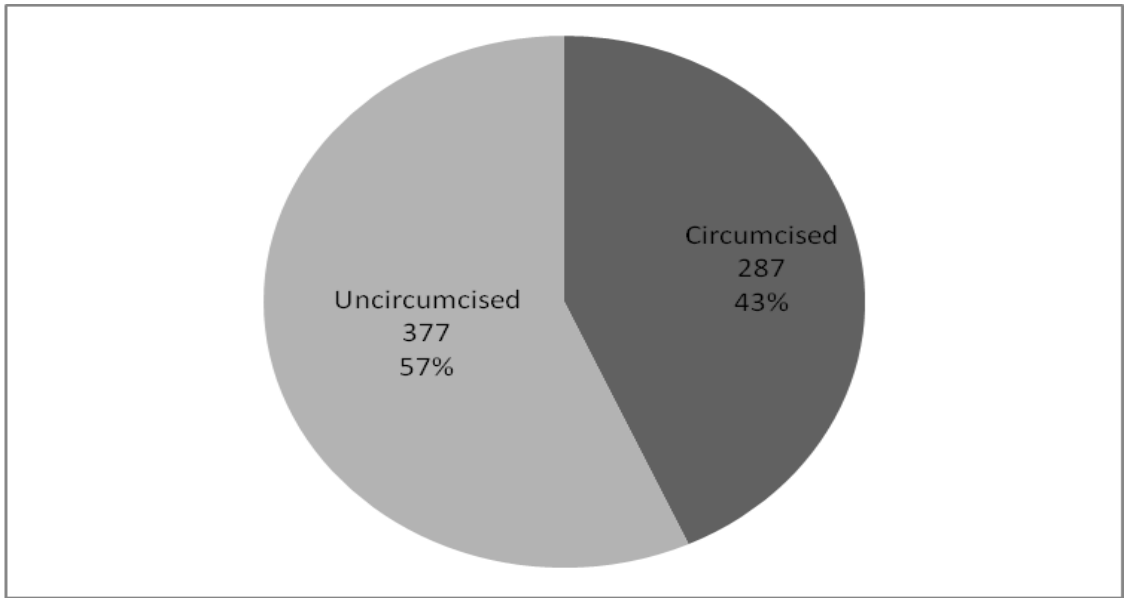

Figure 4.2: Proportion of circumcision among infants brought at RCH clinic (N=664)

4.3 Attitude on infant male circumcision

Parents in Mufindi district had different attitudes towards infant circumcision. Parents who thought that Male circumcision protects against HIV infection were 590 (88.9%), and those who thought that it protects against STI were 597 (89.9%). Also 525 (79.1%) parents thought that male circumcision offers some protection against penile cancer and 614(92.5%) said it improves penile hygiene. Of the 664 respondents, 448 did not think that circumcision reduces fertility in men and 118(17.8%) did not agree with the statement that male circumcision improves sexual pleasure in men and 416 (62.7%) did not agree with the statement that male circumcision reduces sexual pleasure in women. Among the respondents, 102 (15.4%) did not think male circumcision benefit to women in any way (Table 4.3a).

Table 4.3a: Attitude of parents on male circumcision (N=664)

Item about attitude on male circumcision	Circumcision status of infant	Positive attitude		Indifferent		Negative attitude	
		Number	(%)	Number	(%)	Number	(%)
Protects against HIV	Circumcised	267	(93.00)	10	(3.50)	10	(3.50)
	Uncircumcised	323	(85.70)	42	(11.10)	12	(3.20) (3.30)
Protects against STI	Circumcised	266	(92.70)	15	(5.20)	6	(2.10)
	Uncircumcised	331	(87.80)	38	(10.10)	8	(2.10)
Protects against penile cancer	Circumcised	247	(86.10)	32	(11.10)	8	(2.80)
	Uncircumcised	278	(73.70)	82	(21.80)	17	(4.50)
Protects the partner against uterine cancer	Circumcised	243	(84.70)	32	(11.10)	12	(4.20)
	Uncircumcised	276	(73.20)	88	(23.30)	13	(3.40)
Improves penile hygiene	Circumcised	271	(94.40)	8	(2.80)	8	(2.80)
	Uncircumcised	343	(91.00)	26	(6.90)	8	(2.10)
Reduces fertility in men	Circumcised	203	(70.70)	42	(14.60)	42	(14.60)
	Uncircumcised	245	(65.00)	74	(19.60)	58	(15.40)
Improves male sexual pleasure	Circumcised	52	(18.20)	47	(16.40)	187	(65.40)
	Uncircumcised	66	(17.60)	107	(28.50)	203	(54.00)
Reduces female sexual pleasure	Circumcised	188	(65.50)	29	(10.10)	70	(24.40)
	Uncircumcised	228	(60.50)	62	(16.40)	87	(23.10)
Does not benefit women in any way	Circumcised	48	(16.70)	32	(11.10)	207	(72.10)
	Uncircumcised	54	(14.300)	70	(18.60)	253	(67.10)

* Totals do not add up to 664 due to non-response on some items.

Generally, 61.1% of the parents had positive attitude towards male circumcision while 38.5% had negative attitude. (Table 4.3b)

Table 4.3b: Attitude of parents on male circumcision

	Positive Attitude	**Negative Attitude**	**Total**
Circumcised	189 (66.1%)	97(33.9%)	286(100.0%)
Uncircumcised	218 (58.0%)	158 (42.0%)	376 (100.0%)
Total	407(61.5%)	255 (38.5%)	662 (100.0%)

The attitude of the parents towards male circumcision is associated with uptake of the circumcision service. (95% CI 0.02, 0.75 P 0.034)

4.4 Factors associated with uptake to infant male circumcision.

Findings from this study show that single mothers are 1.2 more likely to send their children for circumcision compared to married or cohabiting parents, and widowed parents are 2.26 more likely. With regard to occupation as a factor for performing infant circumcision, Housewives were found to 1.85 more likely to circumcise their infants compared to peasants. With regard to tribes, Kinga were 4.37 more likely compared to Hehe and Bena were 3.53 more likely compared to Hehe. Education level has been found to another factor. Those with a primary education were 204.6 more likely to circumcise their infants compared to those with no formal education. Those with above secondary education were 499.3 more likely to circumcise their infants. Safety concerns were also a factor for circumcision.

Fathers, who were not circumcised, were less likely to take their child for circumcision compared to fathers who were circumcised. The odd for circumcision for the uncircumcised fathers was 0.54 compare to circumcised fathers

Those who did not approve male circumcision as a safe were less likely to take their infants for circumcision the results show that the odd circumcising their infants for those who said infant circumcision somehow safe were 0.04, somehow unsafe were 0.2 compared to those who said circumcision was very safe. (Table 4.4a&b)

Table 4.4a: Correlates of infant male circumcision in Mufindi District

Characteristics	Circumcised n (%)	Odds Ratio (95% Conf. Interval)
Marital status of the mother		
Married /cohabiting	222(44.4)	Reference
Single	41(32.5)	1.20(0.32, 4.48)
Widowed	14(70)	2.26(0.05, 109.73)
Divorced	10(55.6%)	0.48(0.05,4.65)
What is your Main occupation?		
Peasantry	31(70.5)	Reference
Housewife	10(41.7)	1.85 (0.01, 252.18)
Petty business	66(34.4)	0.20(0.02, 2.12)
Formal employment	159(48)	0.50(0.05, 5.25)
What is your religion?		
Christian	258(42.9)	Reference
Muslim	19(41.3)	0.92(0.16, 5.22)
Other Religion	10(62.5)	0.01(0.00, 0.54)
What is your tribe?		
Hehe	125(42.4)	Reference
Kinga	43(48.3)	4.37(0.78, 24.56)
Mbena	90(46.2)	3.53(1.16, 10.74)
Other tribes	29(34.1)	2.20(0.49, 9.81)
What is your Education level?		
No formal education	**13(37.1)**	Reference
Incomplete primary	37(53.6)	204.55(5.28, 7,928.60)
Completed primary education	108(38.2)	7.58(1.66, 34.57)
Incomplete secondary education	63(58.3	.00(1.44, 44.31)
Completed Secondary education	53(38.7)	6.56(1.22,35.26)
Above secondary education	13(40.6)	499.29(1.06, 234,380.00)

Table 4.4b: Correlates of infant male circumcision in Mufindi District

Characteristics	Circumcised n (%)	Odds Ratio (95% Conf. Interval)
What is your Income level?		
low	89(36.9)	Reference
Medium	193(47.2)	1.08(0.39, 3.02)
High	5(35.7)	0.31(0.03, 3.49)
Is the father of the child circumcised?		
Yes	260(44.6)	Reference
No	22(32.8)	0.54 (0.10,2.86)
I don't know	5(35.7)	0.16(0.00, 21.63)
How safe is Infant Circumcision procedure?		
Very safe	253(49.2)	Reference
Somehow safe	14(31.8)	0.04(0.00, 0.41)
I don't Know	12(16)	0.45(0.04, 4.84)
Somehow unsafe	2(14.3)	0.20(0.01,4.79)

4.5 Reasons for uptake of circumcision

The respondents reported the main reasons for performing male circumcision to their sons included to improve penile hygiene of their children and protection against HIV. Other reasons included protection against Cancer and to improve sexual performance. Table 4.5a

Table 4.5a: Reasons for uptake infant circumcision (N=287)

Main reason	Number (%)
Protection against HIV	91 (31.7)
Hygiene	139 (48.4)
Protection against cancer Improve	14 (4.9)
sexual performance	5 (1.7)
Other reasons	38 (13.2)

Parents who did not to accept infant circumcision reported the reason for not performing male circumcision being too young for the procedure 170 (45.1%) and 66 (17.5%) feared complications table 4.5b.

Table 4.5b: Main reason for non-uptake of infant circumcision

Main reason	Number (%)
Unaware of service	44 (11.7)
Fear of complications	66 (17.5)
Religious barriers	6 (1.6)
Culture barrier	4 (1.1)
Inhibit penile growth	38 (13.2)
Let him grow and decide	14 (3.7)
Child is too young	170 (45.1)
Long distance to health facility	15 (4.0)
The father rejects	27 (7.2)
Other reasons	2 (0.5)

CHAPTER FIVE

5.0 DISCUSSION

This study aimed at determining factors associated with uptake of infant male circumcision in Mufindi district with the emphasis on determining the proportion of male infants getting circumcised, the attitude of the parents towards infant male circumcision, the reasons for circumcision and the factors that are associated with the uptake of infant circumcision. The study revealed that the majority of the parents (80%) were exposed to information about the availability of IMC services within the region. In this study, we also found that the decision making on circumcision was collective decision between the father and the mother, and apart from this the father was the most important decision maker on the infant male circumcision. For the infants who were circumcised 79.4 % of them the decision was made collectively between the mother and the father, and 11.8 were made by the father. For those who were not circumcised 61.5 made collective decision not to circumcise while in 21.5% the father refused to circumcise the index son. The role of the health care workers was found to be insignificant in influencing the decision of the parents, although they have been found to be the main source of information. These findings are consistent with the finding in a study by Sema K. et al, 2017, who found that a high proportion of fathers and mothers would not have their child circumcised [31] if one spouse or their parents did not agree. This was especially the case for mothers in Zimbabwe, where 81% of mothers stated that they would not circumcise their infant boys if their husband did not agree, and 71% of the fathers would not do so if their mothers did not agree. Healthcare providers were a very important source of information, but were less influential on the decision-making process. [31]. Parents decide collectively on circumcision of the infants due to the fact that in these traditionally nine circumcising communities there no strong ties of circumcision to cultural values. Rather the decisions are made based on the information received from media, peers and healthcare professionals and therefore provide room for discussion between parents to ascertain the possible benefits.

The proportion of circumcised infants was found to be 43.2%; this shows an increase in proportion of circumcised infants when compared to report from previous studies in Iringa which reports prevalence of 14.6% [15] in Iringa region. Similar studies have shown high levels of male circumcision acceptability in sub Saharan Africa region. Plank et al (2010) in a study among women in South Eastern Botswana on acceptability of IMC (16) and a study by Marisa R et al, 2016 which found that majority (59 %) of parents generally accepted Infant circumcision. These proportions are similar to the proportions of IMC which have been observed by this study in Mufindi District, southern highlands of Tanzania. Another study by Sema K, 2017 found that 54% of the parents in Zambia, and 36% the parents in Zimbabwe, said they definitely take their Male infants for circumcision. [31] The similarity may be due to the fact that there are similar and shared cultural values among communities in southern Africa that determine the acceptability and uptake of circumcision

The study also found that the attitude of the parents towards male circumcision is associated with uptake of the circumcision service. From the respondents, 66.1% of parents with positive attitude towards male circumcision did take their infants the procedure while parents with negative altitude only 33% were circumcised (95%CI, P 0.034). This is similar to findings in a study by Mwanga et al, 2011 in Tanzania where they found that most communities in Tanzania (Ileje and Tabora) had positive attitudes and strong beliefs towards Male Circumcision. Communities in these traditionally non-circumcising districts, similar to Mufindi District, were willing to take their sons for medically performed MC. Religious leaders and traditional gatekeepers supported Male Circumcision as it has been enshrined in their holy scripts and traditional customs respectively. [4] These findings are also similar to the finds in a study by Mhavu et al, 2011 in Zimbabwe where he found that Attitudes towards MC were relatively positive. The same study found that if the communities agreed that if circumcision could prevent HIV, 52% of men reported that they would undergo MC and 58% of women indicated that they would like their partners to be circumcised [31]. The positive attitude towards infant circumcision found in Mufindi may be due to fact that it is enshrined in holy scripts as these are religious communities. And the fact that circumcision protects against HIV, communities in Mufindi are aware of the HIV epidemic due to High prevalence in the

region (11.3) compared to the country prevalence of 4.7% [11] and campaigns that have raised awareness on HIV prevention. Therefore communities are ready to embrace any intervention that will lead to control of HIV epidemic, Circumcision included.

The study also found out that the major reasons for parents taking their male infants for circumcision was to improve genital hygiene (45%) and protection against HIV (32%), other stated reasons were protection against penile cancer 5% and improved sexual performance. Parents who did not take their children for circumcision stated that their children were too young and fragile to undergo the surgery. They had fear for complications and that they thought circumcision could affect the development of their genital organ. These findings are corroborated by other regional studies. Fear of complications has been repeatedly reported as barriers to IMC uptake. [31, 32] Fear of complication cause the parents to believe that circumcision later in life would be safer and therefore better to wait until the child is older. The study found that the average preferred age for circumcision by parents was 2 years. This collaborates the findings from other studies that the distribution of the ideal age for circumcision has been shifting towards a younger age (prior to puberty) but after infancy period. In Zambia and Zimbabwe, it was found that three-quarters of respondents felt that circumcising prior to timing of sexual debut (between infant to 14 years) is ideal, compared with half in Zimbabwe. The split between viewing infancy and early adolescence as the ideal timing was almost equal in both countries (38% from the quantitative survey viewed infancy as ideal versus. 37% viewing adolescence as ideal in Zambia. The fears are barriers which should be targeted with specific educational messaging, including emphasizing that the procedure is safer in infancy than when offered later in life. [31, 32] This fear is a general misconception in the society as circumcision during early infancy has been proven to quicker, safer and simpler compared to older age. With regard to religion, despite having few Muslims in the study 46 (6.9%), it has been shown that the Muslim communities are more likely to accept Infant male circumcision compared to Christians and other religions. This was also found in a study by Mwanga et al 2011, in districts of Tanzania. In Their study, religion was mentioned to influence circumcision as well. Despite of having a few Muslims in their study sample 4 (11%), it was pointed out by many informants, predominantly Christians, from

traditionally non-circumcising communities that Islamic faith insisted on its believers to get circumcised. It is 'suna'(commendable) and a religious requirement as a 'civilized' man

This study has several limitations. The study design was cross sectional. Therefore, it was therefore difficult to assess the cause and effect of infant male circumcision. Second, we conducted interviews at the health facility premises and because of the possibility of illiteracy among study participants; we used face-to-face interviews to study participants rather than a self-administered tool. All these might have introduced information bias and less reliability because respondents might have been offering socially desirable answers. Third, although the study tried to examine factors associated with infant male circumcision, the selected factors were not exhaustive and we might have missed several social factors such as socio-economic and cultural characteristics that could be related to infant male circumcision.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1Conclusion

The study findings show that the proportion of infant getting circumcised has increased by three folds in Mufindi in a period five years. Also we have found that the attitude of parents about IMC is generally favorable, and is one of the factors associated with uptake of IMC. The other factors that are associated with uptake are education level, tribe, and marital status of the mother, main occupation of the parents, perceived safety and circumcision status of the father. For parents who accept infants' circumcision, for most parents, hygiene as the most important reason for circumcision, followed by protection against HIV infection. Parents who do not accept IMC, reported that fear of complications, and young age of the infant were the main factors for refusal to circumcise their infants. The parents preferred circumcision to be conducted at an older age, after infancy period because of fear that infants are too fragile for the procedure.

6.2 Recommendation

We recommend that intervention should increase the focus of IMC on changing the attitude of parents on male circumcision, emphasizing on safety of the procedure and improving penile hygiene. . Educational information surrounding IMC should focus on circumcision protection against HIV, safety of the procedure and target both male and female parents (mother and father) involved in decision making. Sustained acceptability and uptake will require performance of IMC with minimal complications and adverse effects to increase parents' confidence in the safety of the surgical procedure

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APPENDICES

Appendix 1: Interview forms for a parent of an infant (English version)

IDENTIFICATION NUMBER ……. ……NAME OF HF……..

1. How old are you? _____ Years
2. How old is the father of this child _____years
3. What is your current marital status:
    1. Married/Cohabiting
    2. Single
    3. Widowed
    4. Divorced
4. What is your main occupation?
    1) Peasantry
    2) Housewife
    3) Petty business
    4) Formal employment
    5) Other (specify) ……
5. What is your Religion?
    1) Christian
    2) Muslim
    3) Other Specify.....
6. What is your Tribe?
    1) Hehe
    2) Kinga
    3) Bena
    4) Other mention _____

7. What is your highest level of education?
    1) No formal education
    2) Incomplete primary
    3) Completed primary education
    4) Incomplete secondary education
    5) Completed Secondary education
    6) Above secondary education
8. What do you consider to be your income level?
    1) Low
    2) Medium
    3) High
9. **Assess the circumcision status by examining the infant genitals**
    1) Circumcised
    2) Uncircumcised
10. Is the father of the index child circumcised?
    1) Yes
    2) No
    3) Don't know

IN THE FOLLOWING NINE QUESTIONS, STATE IF YOU STRONGLY AGREE, AGREE, UNDECIDED, DISAGREE OR STRONGLY DISAGREE

11. Male circumcision protect against HIV
    1) Strongly Agree
    2) Agree
    3) Undecided
    4) Disagree
    5) Strongly Disagree

12. Male circumcision protect against STI
    1) Strongly Agree
    2) Agree
    3) Undecided
    4) Disagree
    5) Strongly Disagree
13. Male circumcision protect against penile cancer
    1) Strongly Agree
    2) Agree
    3) Undecided
    4) Disagree
    5) Strongly Disagree
14. Male circumcision protects the partner against uterine cancer
    1) Strongly Agree
    2) Agree
    3) Undecided
    4) Disagree
    5) Strongly Disagree
15. Male circumcision improve penile hygiene
    1) Strongly Agree
    2) Agree
    3) Undecided
    4) Disagree
    5) Strongly Disagree
16. Male circumcision reduces fertility in men
    1) Strongly Agree
    2) Agree
    3) Undecided
    4) Disagree
    5) Strongly Disagree

17. Male circumcision improves male sexual pleasure
    1) Strongly Agree
    2) Agree
    3) Undecided
    4) Disagree
    5) Strongly Disagree
18. Male circumcision reduces female sexual pleasure.
    1) Strongly Agree
    2) Agree
    3) Undecided
    4) Disagree
    5) Strongly Disagree
19. Male circumcision does not benefit women in any way.
    1) Strongly Agree
    2) Agree
    3) Undecided
    4) Disagree
    5) Strongly Disagree
20. How safe is the infant male circumcision operation procedure?
    1) Very safe
    2) Somehow safe
    3) I don't know
    4) Somehow unsafe
    5) Not safe
21. If you were to weigh the benefits and risks of taking your son for infant male circumcision, what outweighs the other?
    1) The risks
    2) The benefits
    3) I don't know

22. Have you ever been to a clinic where a service provider talked about infant male circumcision?
    1) Yes
    2) No
23. Have you ever been visited by a health worker or a Peer educator talking about infant male circumcision at home?
    1) Yes, when? ……..
    2) No
24. Have you ever received any Information, Education or Communication materials about infant Male circumcision?
    1) Yes
    2) No
25. Have you ever listened to the radio Programme or advertisement about infant male circumcision?
    1) Yes, When ----------.
    2) No
26. What do you consider to be the appropriate age for male circumcision? ..... (Y or M)

For parent of uncircumcised infants (from Qn no. 9) go to question no. 29

27. Who made the final decision to circumcise your child?
    1) Child's father's decision.
    2) Child's Mother's decision
    3) Our collective decision (father and mother)
    4) Other family member's decision ……..... Other, Please Specify
28. Why did you decide to circumcise you son? (Tick ALL that apply))
    1) Protection against HIV
    2) Hygiene
    3) Protection against cancer

4) Improves sexual performance
5) Other reason (mention)……..

The following questions are for parent of uncircumcised infants only

29. Who made the final decision not to circumcise your child?
    1) Child's father's decision.
    2) Child's Mother's decision
    3) Our collective decision (father and mother)
    4) Other family member's decision ……..... Other, Please Specify

30. Why didn't you decide to circumcise your son? (Tick ALL that apply)
    1) Not aware of the service
    2) Fear of complications
    3) Against my faith
    4) Against my culture
    5) Affects sexual performance
    6) Affects development of the genitalia/growth of the penis
    7) Unethical, wait for him to grow and decide
    8) Too young
    9) Distance from the facility
    10) The father does not want his son circumcised
    11) Other reason (mention)……..

Appendix 2: Interview questionnaire for a parent baby pair (Kiswahili version)

NAMBA YA UTAMBULISHO……JINA LA KITUO CHA AFYA ……

1) Una Umri gani (mama ya mtoto)? _____miaka
2) Baba ya mtoto ana umri gani? _____miaka
3) Hali yako ya ndoa ikoje?
    1) Nimeolewa/naishi na mwanaume
    2) Sijaolewa
    3) Mjane
    4) Mtaraka
4) Unafanya shughuli gani za kiuchumi (chagua jibu sahihi)
    1) Nimeajiriwa na serikali
    2) Nimeajiriwa na makampuni binafsi
    3) Nimejiajiri mwenyewe (mfanya biashara)
    4) Mkulima
    5) Sina ajira
5) Wewe ni dini gani?
    1) Mkristu
    2) Muislam
    3) Dini nyingine (Taja _____)
6) Wewe ni kabila gani?
    1) Mhehe
    2) Mkinga
    3) Mbena
    4) Kabila jingine(Taja_____)
7) Una kiwango gani cha elimu
    1) Sijasoma kabisa
    2) sikuhitimu elimu ya msingi
    3) Nimehitimu elimu ya msingi

4) Sikuhitimu elimu ya sekondari
5) Nimehitimu elimu ya sekondari
6) Nina elimu ya ya zaidi ya sekonday

8) Una kipato cha kiwango gani? (Jinsi unavyojiona mwenyewe)
   1) Kiwango cha chini
   2) Kiwango cha kati
   3) Kiwangoi cha juu

9) Angalia kama mtoto ametahiriwa.
   1) Ametahiriwa
   2) hajatahiriwa

10) Je, baba wa mtoto huyu ametahiriwa?
   1) Ndio
   2) Hapana
   3) Sijui

KATIKA MASWALI TISA YANAYOFUATA, JIBU KAMA UNAKUBALIANA SANA, HAUKUBALINI, HUJUI, UNAKUBALIANI, HUKUBALIANI SANA NA SENTENSI ZILIZOWEKWA.

11) Tohara ya mwanaume inapunguza uwezekano wa kupata maambukizi ya ugonjwa wa UKIMWI
   1) Nakubaliana sana
   2) Nakubalini
   3) sijui
   4) Sikubaliani
   5) Sikubaliani sana

12) Tohara ya mwanaume inapunguza uwezekano wa kupata maambukizi ya magonjwa ya zinaa.
   1) Nakubaliana sana
   2) Nakubalini
   3) sijui

4) Sikubaliani
5) Sikubaliani sana

13) Tohara ya mwanaume inapunguza uwezekano wa kupata saratani ya uume.
    1) Nakubaliana sana
    2) Nakubalini
    3) sijui
    4) Sikubaliani
    5) Sikubaliani sana

14) Tohara ya mwanaume inapunguza uwezekano wa kupata saratani ya mlango wa uzazi.
    1) Nakubaliana sana
    2) Nakubalini
    3) sijui
    4) Sikubaliani
    5) Sikubaliani sana

15) Tohara ya mwanaume inarahisisha usafi wa uume.
    1) Nakubaliana sana
    2) Nakubalini
    3) sijui
    4) Sikubaliani
    5) Sikubaliani sana

16) Tohara ya mwanaume inapunguza uwezo wa mwanaume kuzaa.
    1) Nakubaliana sana
    2) Nakubalini
    3) sijui
    4) Sikubaliani
    5) Sikubaliani sana

17) Tohara ya mwanaume inaongeza uwezo wa mwanaume kufanya tendo la ndoa?

1) Nakubaliana sana
2) Nakubalini
3) sijui
4) Sikubaliani
5) Sikubaliani sana

18) Tohara ya mwanaume inapunguza uwezo wa mwanamke kufurahia tendo la ndoa?

1) Nakubaliana sana
2) Nakubalini
3) sijui
4) Sikubaliani
5) Sikubaliani sana

19) Tohara ya mwanaume haimnufaishi mwanamke kwa namna yeyote ile?

1) Nakubaliana sana
2) Nakubalini
3) sijui
4) Sikubaliani
5) Sikubaliani sana

20) Tohara kwa mtoto mchanga ni salama kiasi gani?

1) Salama
2) Ni Salama kidogo
3) Sijui
4) Si salama kidogo
5) Si salama

21) Ukilinganisha faida na hasara za tohara kwa mtoto mchanga, ipi inaizidi nyingine

1) Faida
2) Hasara
3) Sijui

22) Umewahi kuwa kwenye kituo cha kutolea huduma ambapo mtoa huduma alitoa elimu kuhusu tohara ya watoto wachanga?

1) Ndio
2) Hapana

23) Umeshawahi kutembelewa /kuonana na mtoa huduma akakueleza kuhusu tohara ya watoto wachanga?

1) Ndio
2) Hapana

24) Umewahi kusoma au kuona machapisho yeyote juu ya tohara kwa watoto wachanga?

1) Ndio
2) Hapana

25) Umeshawahi kusikiliza matangazo au kipindi cha redio kilicho zungumzia kuhusu tohara kwa watoto wachanga?

1) Ndio
2) Hapana

26) Unadhani umri sahihi wa kutahiriwa ni ……. (.miaka/miezi)

Mama ambaye mtoto wake hajatahiriwas (swali namba 9), nenda swali la 29

27) Ni nani alifanya maamuzi yaliyopelekea mtoto kutahiriwa?

1) Baba ya mtoto
2) Mama ya mtoto
3) Tuliamua pamoja (baba na mama)
4) Tulishuriwa na mtu mwingine. (Mtaje_____)

28) Ni sababu ipi ilipelekea mwano kutahiriwa? (chagua sababu **ZOTE** ambazo ni sahihi)

1) Kumkinga na maambukizi ya UKIMWI
2) Kwa ajiri ya usafi wa uume
3) Kumkinga na saratani ya uume
4) Kumuwezesha kufurahia tendo la ndoa
5) Sababu nyingine. (taja_____)

Maswali yafuatayo ni kwa mama ambaye mtoto wake hajatahiriwa pekee.

29) Ni nani alifanya maamuzi yaliyopelekea mtoto kuto kutahiriwa? (chagua sababu **ZOTE** ambazo ni sahihi)

1) Baba ya mtoto
2) Mama ya mtoto
3) Tuliamua pamoja (baba na mama)
4) Tulishuriwa na mtu mwingine (Mtaje_____)

30) Kwa nini uliamua mwanao asitahiriwe (sababu moja ya kuu)

1) Sikujua kama kuna huduma
2) Niliogopa madhara yanayotokana na operesheni ya tohara
3) Ni kinyume na Imani yangu ya dini
4) Ni kinyume na utamaduni wangu
5) Inaathiri uwezo wa mwanaume kujamiiana
6) Inathiri ukuaji wa uume wa mtoto
7) Ni kinyume na maadili, ataamua mwenye kutahiriwa atakapokua mkubwa
8) Ni mdogo mno kufanyiwa tohara
9) Kituo cha huduma kiko mbali sana
10) Sababu nyingine (Taja)

Appendix 3: Consent form (English version)

TITLE: FACTORS ASSOCIATED WITH UPTAKE OF INFANT MALE CIRCUMCISION (IMC) FOR HIV PREVENTION AMONG PARENTS ATTENDING RCH CLINIC IN MUFINDI DISTRICT

Foreword

My name is Dr Innocent Kasmir Mhagama. I am a researcher from Muhimbili University of Health and Allied Sciences. I am conducting a study Factors associated with uptake of infant male circumcision (IMC) for HIV prevention among parents attending RCH clinic in Mufindi District.

How to participate in this study

You are asked to participate in this study because you are a parent of a male infant who is a candidate for Infant Circumcision for HIV prevention. If you are willing to participate in this study, you will fill a questionnaire with several questions enquiring on uptake of Infant circumcision.

Purpose and Rationale of the study

The aim of the study is to determine the factors associated with uptake of infant male circumcision among parents attending RCH clinic in Mufindi. Practically, the findings of this study can inform facility managers, policy makers and stakeholders to design relevant programs and interventions that take into considerations the social contexts and improve how these programs are managed. Also, this study will add knowledge in literature for further research activities.

Confidentiality

Everything will remain confidential and will be used only for research purposes. The research team will compile a report that will contain information from participants in this study and information will be treated confidentially and anonymously as no person links (name, patient Ids number, form etc. will be documented.

Risks

I do not expect that any harm will happen to you as a result of participating in the study.

Right to participate in the study

Taking part in this study is completely of your choice. You have the right to participate or decide otherwise without giving any reason for your decision. Once you have decided to participate you are also free to terminate your participation at any time.

Who to contact

If you have any questions about this study you are free to contact, the principal investigator, Dr. Innocent Mhagama (0755 078497).If you have any questions/concerns about your rights as a participant you may contact Dr. Bruno Sunguya, Chairman of MUHAS Research and Publications Committee. P.O.BOX 65001 Dar es Salaam. Tel 0221503026

If you agree to participate in this study, please sign this consent form.

I …… have read and understood the contents of this consent form and my questions have been sufficiently answered. I therefore consent for the interview for this study.

Signature of the respondent …….....Date ……

Signature of the interviewer ……....……Date ……

Appendix 4: Consent form (Swahili Version)

FOMU YA RIDHAA YA KUSHIRIKI KATIKA UTAFITI

Kichwa cha Utafiti

Mambo yanayohusiana na kukubalika kwa tohara ya watoto wachanga wa kiume (IMC) ya kuzuia VVU kati ya wazazi wanaohudhuria kliniki ya RCH wilaya ya Mufindi.

Utangulizi

Jina langu ni **Dk. Innocent Kasmir Mhagama** mimi ni mtafiti kutoka Chuo Kikuu cha Afya na Sayansi Shirikishi cha Muhimbili. Ninafanya utafiti wa mambo yanayohusiana na kukubalika kwa tohara ya watoto wachanga wa kiume (IMC) kwa ajili ya kuzuia VVU kati ya wazazi wanaohudhuria kliniki ya RCH wilaya ya Mufindi.

Jinsi ya kushiriki katika utafiti huu

Unaombwa kushiriki katika utafiti huu kwa sababu wewe ni mzazi wa mtoto mchanga ambaye anaweza kutahiliwa kwa ajili ya kujikinga/kuzuia VVU. Ukikubali kushiriki katika utafiti huu, utajaza dodoso na maswali kadhaa yaliyo kwenye dodoso yanayolenga kujua kuuliza juu ya kukubalika kwa tohara kwa watoto wachanga.

Dhumuni la utafiti

Lengo la utafiti huu ni kuchunguza mambo yanayohusiana na kukubalika kwa tohara ya watoto wachanga wa kiume kwa wazazi wanaohudhuria kliniki ya RCH wilaya ya Mufindi. Matokeo ya uchunguzi huu yanaweza wasaidia watengeneza sera, wasimamizi wa huduma za afya, na wadau wengine kuandaa programu na afua zinazolenga kuimarisha mapambano dhifi ya ukimwi kupitia tohara kwa watoto wachanga. Matokeo haya pia yatasaidia kuongeza uelewa kwa ajili ya tafiti zingine huko mbeleni.

Usiri

Kila kitu kitabakia kuwa siri na kitatumika kwa ajili ya utafiti tu. Timu inayohusika na utafiti itatumia majibu yote kuandaa ripoti itakayokuwa na habari zako na za wazazi wengine walioshiriki katika utafiti huu na taarifa zitawekwa kwa usiri na mhusika hatajulikana kwani anuani na majina havitaumika mahala popote.

Madhara

Sitegemei kutakuwa na kitu chochote kitakachotokea kwako kwa kushiriki katika utafiti huu.

Haki ya kushiriki

Ushiriki wako katika utafiti huu si lazima. Una uwezo wa kukubali au kukataa bila kutoa sababu zozote za kufanya hivyo. Na ukikubali, unaweza kubadili uamuzi wako wakati wowote. Ukiwa na maswali yoyote kuhusu utafiti huu, uwe huru kuwasiliana nami, mtafiti mkuu, Dk. Innocent Kasmir Mhagama (0755078497)

Kama utakuwa na maswali kuhusu haki zako kama mshiriki, unaweza kumpigia Dr. Bruno Sunguya, Mwenyekiti wa kamati ya utafiti, Simu namba 0221503026

Kama umekubali kuhojiwa, tafadhali saini hapa:

Mimi....……..……nimesoma na kuelewa kilichoelezwa kwenye fomu hii na maswali yangu yamejibiwa kiufasaha. Hivyo ninakubali kujibu maswali yaliyopo kwenye dodoso kwa ajili ya utafiti huu.

Sahihi ya mhojiwa ……..…… Tarehe ……...

Sahihi ya mkusanya taarifa…….…….....Tarehe.....

Appendix 5: Sample selection

Total Health centers and Hospitals (16)	**Health facilities that provide IEMC services (5)**	**Randomly selected Health Facilities (3)**	**Sample size from each facility (Total sample size is 726)**
14 Health Centers and 2 Hospitals (16 Health Facilities)	1. Mafinga Hospital 2. Usokami Health Center 3. Kasanga Health Center 4. Nyololo Health Center 5. Lugoda Health Center	1. Mafinga Hospital	242
		2. Kasanga H/C	242
		3. Nyololo H/C	242

Appendix 6: Approval Of Ethical clearance

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

OFFICE OF THE DIRECTOR OF POSTGRADUATE STUDIES

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Ref. No. DA.287/298/01A/

22nd May, 2019

Mr. Innocent Kasmir Mhagama
MPH-Distance Learning
MUHAS.

RE: APPROVAL OF ETHICAL CLEARANCE FOR A STUDY TITLED: "FACTORS ASSOCIATED WITH UPTAKE OF EARLY INFANT MALE CIRCUMCISION IN MUFINDI DISTRICT"

Reference is made to the above heading.

I am pleased to inform you that, the Chairman has, on behalf of the Senate, approved ethical clearance for the above-mentioned study. Hence you may proceed with the planned study.

The ethical clearance is valid for one year only, from 21st **May, 2019 to 20th May, 2020.** In case you do not complete data analysis and dissertation report writing by **20th May, 2020,** you will have to apply for renewal of ethical clearance prior to the expiry date.

Dr. Emmanuel Balandya
ACTING: DIRECTOR OF POSTGRADUATE STUDIES

cc: Director of Research and Publications
cc: Dean, School of Public Health and Social Sciences, MUHAS