

Knowledge, Attitude and Practices about Provision of Voluntary Medical Male Circumcision Services among Service Providers in Mufumbwe District of North-Western Province

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ABSTRACT

Background: Male circumcision, a surgical removal of the foreskin that covers the penis is identified to be effective towards prevention of Human Immunodeficiency Virus and Sexually transmitted infections among heterosexual partners worldwide. The practice is recommended to be provided by trained personnel traditional or community members, mostly Healthcare practitioners. To provide Voluntary Male Circumcision to a given population requires right knowledge, positive attitude and good practices among the Circumcision providers.

Objectives: To assess the Knowledge levels attitude and practices towards provision of medical male circumcision services among service providers in Mufumbwe, district of Northwestern province.

Method: This was a Mixed methods study that was conducted from May 2022 to September 2022. Data was collected using semi structured questionnaire. Purposive sampling was applied to one (1) Medical Officer, three (3) Medical licentiate and three HIV Nurse prescribers. Purposive sampling was also be used to select other respondents from one (1) Hospital, five (5) Rural Health Centres and Convenience sampling was used to select respondents from 22 rural health post.

Findings: The sample consisted of 91 participants. 12(13.48%) were trained and 77 (86.52%) were not trained form a total of 87 (100.00%) responses. A total of 91 participants knowledge level were recorded and a good score of 60 (65.93%). From a total of 69 non-MC providers, it was found that 63 (91.30%) had positive attitude and the attitude of Mc providers was analysed and found to be 19 (95.00%) positive. And practices that are associated with healthcare practitioners in regard to providing voluntary medical male circumcision services in Mufumbwe district Northwestern province. 6 (33.33%) from 18 responded offered MC in the past 12 months. 18 respondents from 71 respondents who did not know how to circumcise, 13(72.22%) said they refer the clients.

INTRODUCTION

Background

Medical male circumcision (MMC) is among the heavily promoted and implemented Human Immunodeficiency Virus (HIV) prevention strategies around the globe and is compelling Public and private health sectors to among many things invest in Surgical Supplies and knowledge and skills development on safe Male circumcision (MC), to Medical and health care personnel.

Historically, “Male circumcision is one of the oldest and most common surgical procedures worldwide, and is undertaken for many reasons: religious, cultural, social and medical” (Weiss et al. 2008:1) As a result of ideal research substantial evidence of a 59% (44 %–70 %) reduction in HIV risk (efficacy), and the World

Health Organization (WHO) and the Joint United Nations Program on HIV/AIDS (UNAIDS) suggestion that VMMC is included in comprehensive HIV prevention programming in areas where HIV prevalence is high, but MC rates are low, countries in sub-Saharan Africa are implementing the recommendations such that in the 15 priority nations of East and Southern Africa, where almost half of all new HIV infections occurred in 2019, over 23 million Voluntary medical male circumcisions (VMMC) procedures have been conducted since 2007.

Before the year 2010 In Zambia, circumcision was commonly practiced by certain ethnic or cultural groups such as the inhabitants of the North-western province of Zambia where the practice was only considered a traditional practice. WHO in partnership with UNAIDS recommendations and accumulation of research evidence of reducing the prevalence of HIV and other sexually transmitted diseases, the practice is now conducted in all parts of the country by trained personnel. The Ministry of Health is supporting VMMC programs as a public health solution to the prevalence of HIV. In A Report on the National Male Circumcision Situation Analysis, the Ministry of Health (2009, p. iv) states that “more HIV prevention needs to be done and hence the Zambian government has endorsed male circumcision (MC) as one of the key preventive strategies to be scaled up.”

Educating, particularly the education of health care practitioners on the medical benefits of MMC and resolving impediments to their engagement in MMC promotion, is a critical component of MMC scale-up. Therefore, the study will assess the Knowledge, attitude and practices about the promotion and provision of VMMC among health care workers. There is currently no publication to my knowledge that examines the knowledge, attitude, and practice of health care personnel about the provision of VMMC in any part of Zambia.

Statement of the Problem

Even though the Zambian government has endorsed MC as one of the most important HIV prevention measures to be ramped up, several districts were still falling short of the planned 50% goal halfway through 2016-2020 National Operational Plan. It has been noted by the Ministry of Health (2009) that Knowledge level about the benefits and risks, attitudes and cultural practices of community members toward MC play a role in scaling up the program. However, Though MC is practised by a substantial ethnic group in the northwestern regions, Mufumbwe district of the northwestern Province is one of three districts that had less than 50% coverage by June 2018 (Ministry of Health, 2019) (Ministry of Health 2009).

The knowledge of individuals towards health practices influences their health behaviour and improves an individual health outcome. In a similar fashion the extensive Knowledge of a service provider aids a positive mindset and good work habits. Improving the service outcome knowledge, attitude, and practice (KAP) of healthcare professionals concerning MMC impacts their program adherence. Knowledge, attitude, and practice (KAP) of health care practitioners (HCP) are critical in HIV prevention and the entire MMC program's success. (McEachan *et al.*, 2016).

There is a willingness attitude among HCPs to be taught in MC, indicating that, some HCPs treat clients with care and respect. These behaviors also assume that there is a segment of some health care providers who are impatient and unaccommodating to clients. Health care practitioners stigmatized attitudes as essential individuals in dealing with people from various social classes may have unfavorable results, such as dealing with fear, disgust, rage, and, in some situations, refusal to accept the client. Discriminatory treatment and inequality of HCPs interacting with persons from a desired social class compared to other clients can have an impact on the service provided by the personnel and may deprive marginalized individuals of their basic health rights (Zarei *et al.*, 2015).

A few studies have been conducted to identify knowledge, attitude, and practice of MMC among HCPs in developing countries. To this effect, no sturdy has been done in Mufumbwe district of North-western province or any part of Zambia to determine the knowledge, attitude and practices of health care practitioners if offered scaling up of MMC for HIV prevention.

Rationale of the Study

There is a report of low VMMC coverage in Mufumbwe and Mwinilunga district both of North-western province. The low rate associated with circumcision are the most telling indication that the VMMC program has hiccups worthy learning about. Various literatures identify the community attitudes and Perceptions associated with VMMC within a traditional circumcising community. However, because the success of the VMMC program also depends on HCPs level of knowledge, attitude, and practice, the findings will create to the body of literature on VMMC Services and such literature will assist in designing of health programs that will improve the provision of VMMC services and awareness among program Coordinators, Directors within Mufumbwe district and North-western province.

Research Aim

This study aims to assess the Knowledge levels attitude and practices toward the promotion of VMMC services among service providers in Mufumbwe, a district of the North-western province.

Objectives

The following objectives will guide the study:

- 1.4.1 To describe the proportion of Health care practitioners in the Mufumbwe district that have undergone formal voluntary medical male circumcision training.
- 1.4.2 Determine health care workers' Knowledge regarding voluntary medical male circumcision programs in the Mufumbwe district.
- 1.4.3 To assess health care workers' attitude regarding voluntary male medical circumcision service provision/promotion to Male clients visiting the health facilities in the Mufumbwe district.
- 1.4.4 To identify the practices involved in voluntary medical male circumcision among health care practitioners in the Mufumbwe district.

Research Questions

- 1.5.1 What is the level of correct knowledge about Voluntary male medical circumcision among health care practitioners providing STI/HIV prevention services in Mufubwe district, North-western province?
- 1.5.2 Which features of Voluntary male medical circumcision have the lowest level of correct knowledge among health care practitioners?
- 1.5.3 What are the characteristics of Perceptions of health care practitioners about VMM?
- 1.5.4 How do Healthcare practitioners provide Voluntary male medical circumcision in Mufubwe district, North-western province?
- 1.5.5 How do Health care practitioners providing VMMC to caution daily challenges associated with service?

LITERATURE REVIEW

Voluntary Male Circumcision as a Public Health Measure

In a press release by USAID (2011) the World Health Organization (WHO) and the Joint United Nations Programme on HIV/AIDS (UNAIDS) have advised that VMMC be implemented in countries where HIV prevalence is high but MC is low. USAID comes to the conclusion that circumcision lowers the risk of HIV sexual transmission to men by about 60%. From such knowledge, Titus and Moodley (2011) advise that despite the fact that MC is considered an effective and cost-effective public health method for combatting HIV

in heterosexual men in high-prevalence areas, there is some caution when it comes to using circumcision for HIV prevention due to practical problems

The Role of Health Care Practitioners in Male Circumcision Services

The service is delivered as a package that includes more than just a surgical operation, and a minimum package of services provided include, HIV testing and counselling, Screening for STIs and treatment and where required Provision and promotion of condoms, Counselling on risk reduction and safer sex and finally MC surgical procedures under local anesthesia. Health care practitioners (HCPs) are responsible for providing all required information for MC informed consent, including risks, benefits, and the freedom to decline the treatment without fear of retaliation or other negative consequences (Gostin & Hankins 2008).

Health Care Practitioners' Knowledge About VMMC Service

However, in a study by Starzyk *et al.* (2015) and Langins & Borgermans (2015), it is discovered that health care Practitioners have uneven knowledge and competencies about medical practices specific to profession and level of care. Starzyk *et al.* (2015) explain that HCPs' understanding of the risks and benefits of infant male circumcision (IMC) is severely lacking, furthermore, it is discovered that substantial differences exist amongst HCPs, with pediatricians having more total evidence knowledge than obstetricians and family practitioners. In another study by Dévieux *et al.* (2015), Health care practitioners have favourable views of MMC and are well-informed about its benefits and disadvantages, but Milford *et al.* (2016), argues that although most healthcare providers are aware that VMMC can reduce HIV transmission to the circumcised man, their awareness of the topic is limited, most likely because only a few had had specialized HIV prevention training

In terms of understanding the benefits and risks to counseling parents of newborn male infants, a significant proportion of HCPs do not have sufficient understanding, and more still do not have a sufficient understanding of the benefits and risks to counsel adult men (Carbery *et al.*, 2012).

Attitude Towards VMMC

The misunderstanding amongst healthcare practitioners that MMC completely prevents HIV infection, contributes to healthcare workers' aversion to conducting infant circumcision. If the erroneous assumption that MMC completely prevents HIV could be dispelled, there would be a higher likelihood that MMC could be performed on children under the age of one year (Dévieux *et al.*, 2015).

There are various reasons linked to physicians who are unaware of the benefits and risks of circumcision for newborn male infants as well as those who are unaware of the advantages and disadvantages of adult MC. Being a female physician, having little or no experience with the African MC trial outcomes, and seeing fewer patients per week are all linked to not knowing the benefits and risk of MC in Male Children and adults. A significant number of female doctors are hesitant to counsel male circumcision patients (Carbery *et al.*, 2012). Starzyk *et al.* (2015) confirms in a study that HCPs with more expertise had ever declined to circumcise a newborn or baby boy compared to those with less knowledge, citing a risk of the process (e.g., hypospadias, penile abnormalities, small penis size, and concern for sepsis).

Healthcare practitioners express negative impressions and experiences with VMMC implementation Due to a lack of preparation and training by program implementers such as Health Departments with assistance from contracted NGOs and private general practitioners. In order to improve on their existing knowledge and address potential misunderstandings, it is critical to ensure that healthcare providers are regularly trained and informed about the efficacy of MMC because Many clinicians show an interest in learning new surgical techniques for doing VMMC (Mavhu *et al.*, 2014; Dévieux *et al.*, 2015; Milford *et al.*, 2016).

Practices of Health Care Practitioners in Male Medical Circumcision Services

The effectiveness of the VMMC program depends on the collaboration of health care providers and the community (Ashengo *et al.*, 2014). Ashengo *et al.*, (2014) explain how in Zimbabwe, MCs were performed at a higher rate during community mobilisation and campaigns (64%) than during ordinary service delivery

(36%) though they prefer to do surgical procedures in institutions for infection control reasons. Whether a healthcare practitioner should provide MMC service or not is dependent upon the authorization in the scope of practice (SOP) and national VMMC policy. Physicians and non-physicians equally provide safe VMMC, on average, physicians begin providing VMMC with more general surgical expertise, which may contribute to their early success and performance which is counterbalanced by performance in non-physicians HCPs once they have accumulated VMMC-specific expertise (Davis *et al.*, 2021).

In order to ensure proper quality healthcare delivery and provision of VMMC services in accordance with national and international quality health standards, policymakers must plan and coordinate VMMC service delivery (Nxumalo *et al.*, 2021; Windhoek 2009).

In regards to observing health standards and policies, Provider attitudes, preferences, and willingness to follow defined rules, particularly for new interventions, have been shown in various areas of public health to be crucial for program success. Despite the fact that providers in VMMC programs typically support the six criteria of surgical efficiency, they may not always agree with the established recommendations and are unlimited to Frustration with top-down policy. Many providers in Kenya and, to a lesser extent, Tanzania, for example, do not support task-sharing because they believe that the provider has a professional obligation to stay with one client from start to finish. (Mavhu *et al.*, 2014).

HCPs in some health institutions carefully adhere to the VMMC procedure by providing HIV counselling and testing (HCT) to every client seeking VMMC services as guided by the VMMC guidelines. the bureaucratic practice by the service provider creates the fear of HIV testing and finding one's serostatus is viewed as a factor that deters men from seeking VMMC (Skolnik *et al.*, 2014).

While Health workers express their challenge as a Lack of adequate skilled individuals to perform the operations as one of the numerous potential impediments to adopting MC, In the community, there is a scarcity of knowledge on MC. Inadequate surgical equipment, The procedure's cost, in certain clinics, there is a lack of constant electricity or running water and in some clinics, there is a lack of physical space for surgical theatres (Brito *et al.*, 2010).

Progress of VMMC Services In Zambia

Despite the fact that the Zambian government has endorsed MC as one of the most important HIV prevention measures to be ramped up, several districts were still falling short of the planned 50% goal halfway through 2016-2020 National Operational Plan. Ministry of Health, (2009) affirms that Knowledge level about the benefits and risks, attitudes and cultural practices of community members toward MC plays a role in scaling up the program. However, Though MC is practiced by a substantial ethnic group in the northwestern regions, Mufumbwe district of the North-western Province is one of three districts that had less than 50% coverage by June 2018 (Ministry of Health 2019).

The knowledge of individuals about health practices influences their health behaviour and improves the health outcome of an individual. In a similar fashion, the extensive Knowledge of a service provider aids a positive mindset and good work habits and improves the service outcome knowledge, attitude, and practice (KAP) of healthcare professionals concerning MMC has an impact on their program adherence. Knowledge, attitude, and practice (KAP) of health care practitioners (HCP) are critical in HIV prevention and the entire MMC program's success. (McEachan *et al.*, 2016).

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Conceptual and Theoretical Framework

Conceptual Framework

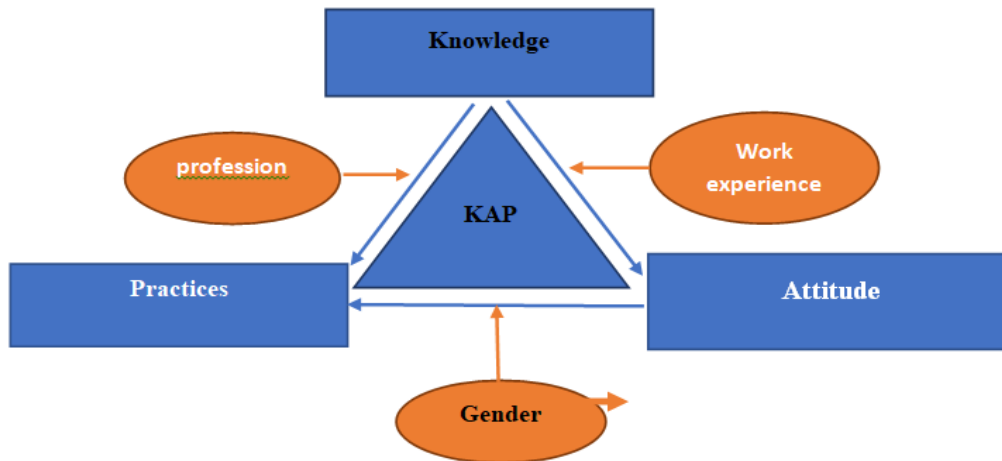


Figure 1: Conceptual Framework

The self developed conceptual framework is based on review of Conventional KAP Model from Kumar *et al.* (2022). According to this KAP model, practice is directly influenced by attitude and knowledge. Attitude is influenced by knowledge.

Theoretical Framework



Figure 2: Theoretical Framework

KAP Theoretical framework proposed by Legare 2008 shows that there are other factors that influence knowledge, attitude and practices but the relationship between the variables (knowledge, attitude and practices) is linear.

METHODOLOGY

Research Approach

This chapter focuses on the methods that was utilized to achieve the research's goals. The methodology will discuss the numerous procedures or approaches employed by the researcher in suitable problems, as well as

the reasoning behind them in accordance with (Kothari 2004). It comprises the site description, study design, sturdy population, selection, data collection techniques, ethical consideration, pretesting, data analysis, dissemination and utilization of results and limitation of the sturdy.

Research design

Mixed methods research will be conducted. The reason for using Mixed methods design is to gain indepth understanding of knowledge, attitude and practice of HCPs who provide VMMC services.

Research setting

Mufumbwe District is one of the nine districts on North-western province with a population of 79781 (CSO 2021 estimates), The district consists of 27 health facilities, 1 General Hospital, 5 rural health centers and 22 rural health centers health Care workers.

Study Population

The Study will include a total population of 138 clinicians who provide health care services at any facility in mufumbwe district will be eligible to be included in this study.

Sampling techniques

Quantitative sample size

The research will use Purposeful strategy and convenience sampling strategy to select health facilities and respondents of the sturdy. Purposive sampling will also be used to select other respondents from one (1) Hospital, five (5) Rural Health Centers. This means participants will be selected because they are likely to generate useful data for the study and provide specific knowledge about the topic of the study. Convenience sampling will be used to select respondents from 22 rural health post. This will be in order to focus only on who will be available at the particular time in order to save time and effort in the research exercise.

The calculation of the sample size required for this study will be with the sample size formula for proportions, In case of a finite population.

$$n = \frac{N}{1 + N(e)^2} = \frac{138}{1 + 138 (0.05)^2} = \frac{138}{1.345} = 102.6022 \approx 103$$

Where:

n = Sample size

N = Population size = 138

e = Level of precision = 5% or 0.05

Qualitative Sample Size

Purposeful strategy was used to select participant that selectected answers that needed more explanations. The sample size was determined by quantitative findings of knowledge, practice and practices.

Data collection techniques

Semi-structured interviews were used to collect data since they provide more room for asking questions and utilizing probing questions to obtain interpretations on confusing topics or to seek more amplifications of incomplete replies (Neuman 2014). Furthermore, by allowing human interaction between the researcher and

the respondents to ease access to information, these interviews important for the researcher to reduce misinterpretations on both the interviewers' and interviewees' parts (Cohen *et al.*, 2002).

Demographic features and relevant in-depth information from participants were collected using an interview guide with both closed and open-ended questions, and their tales were heard in their own language from their own viewpoints. The purpose of using open-ended questions was to have participants to reconstruct their experiences with provision of VMMC services. In-depth interviews were conducted with eligible research participants using the in-depth interview guide. The interview guide was drawn up for individual interviews targeting health care practitioners who provide HIV prevention and sexual reproductive health services. Doubts of confidentiality was solved by identify the respondent by job title. Each respondent will be interviewed privately to avoid necessary disturbances during the interview process.

Data analysis

To examine the data acquired, the researchers employed theme analysis. The data's explicit or surface meanings was used to identify the codes. The limit of the analysis was what a responder had stated or written. The creation of semantic codes was defined as a descriptive data analysis targeted simply at displaying the response score. The Data collected was checked for completeness and consistency by reading the questionnaire numerous times. The data from questionnaire was entered into a Microsoft Excel for sorting and imported to STATA version 14.2 for data cleaning and analysis. Qualitative data was analysed using NVIVO version 8 and interpretations generated from the data was presented. The coding rules were applied to the full corpus of text when sufficient consistency had been achieved. Throughout the coding process, it was necessary to double-check the coding to avoid falling into an idiosyncratic interpretation of the codes (Schilling 2006). After rechecking the correctness of the coding, a Chi-square test was used to determine the factors associated with the participant's knowledge and attitudes. Qualitative data analysis was performed by Nvivo Version 8.

Validity and reliability

A pilot sturdy was conducted in Mwinilunga district, Northwestern province. This involved pre-testing the questionnaire with 5% of the sample size on HCPs in the district. The data was analysed for accuracy and internal consistency in order to adjust the questionnaire accordingly.

Ethical considerations

The University of Lusaka School of Postgraduate Studies, the National Health Research Authority (NHRA), and the provincial and district health administration offices were all contacted for permission and approval. Participants were informed about the current ethical considerations to safeguard their safety and rights. The rights to participate in research and voluntary participation were prioritized in this study. The procedure of obtaining informed consent from participants was ongoing or continuous throughout the investigation. Privacy and confidentiality concerns were given consideration. The results were protected from unauthorized observation by saving the data in a password-protected computer and withholding respondents' names. The participants were allowed to withdraw at any time if they felt uncomfortable. The participant received full disclosure of the nature of the study.

RESULTS

Study participants characteristics

The demographic characteristics of 91 survey participants is summarised in table 1. The sample consisted of healthcare practitioners 6 (6.6%) within the age group 20-24, 35 (38.5%) within 25-29 years, 31 (34.1%) within the age group 30-34 years, 12 (13.2%) within 35-40 years and 7 (7.7%) above 40. 53 (58.2%) of the respondents were Female, while 38(41.8%) were Male. 9(9.9%) were Community Health assistant, 9 (9.9%) Clinicians and 73(80.2%) Nurses and Midwives by Occupation. The highest education level or qualification of the population was; 21 (23.1%) Certificate, 63 (69.2%) Diploma and 7 (7.69%) Degree. 7 (7.7%) had 12-15 years medical work experience, 6 (6.6%) 16-20 years, 48 (52.7%) 2-6 years and 30 (33. %) 7-11 years medical

work experience. From a total of 91 participants, 28 (30.8%) worked from a Health Post, 40 (44.0%) Hospital and 23 (25.3%) Rural health center.

Table 1: Descriptive Characteristics of Health care workers in Mufumbwe District

Variables	Frequency (n)	Percentage (%)
Age (years)		
20-24 years	6	6.6
25-29 years	35	38.5
30-34 years	31	34.1
35-40 years	12	13.2
Above 40 years	7	7.7
Gender		
Female	53	58.2
Male	38	41.8
Occupation		
Community Health assistant	9	9.9
Clinicians	9	9.9
Nurses and Midwives	73	80.2
Qualification		
Certificate	21	23.1
Diploma	63	69.2
Degree	7	7.7
Years of experience		
2-6 years	48	52.7
7-11 years	30	33.0
12-15 years	7	7.7
16-20 years	6	6.6
Health Facility		
Health post	28	30.8
Rural health center	23	25.3
Hospital	40	44.0

Table 2 shows the analysis of Health care practitioners trained in VMMC service. The analysis Excluded 2 participants who did not respond to the question on training. 12(13.48%) were trained and 77 (86.52%) were not trained from a total of 87 (100.00%) responses. The highest proportion respondents was found with gender, 11 (12.36%) Male of 87 (100.00%) total respondent. 11 (91.67%) was the proportion of male to 1 (8.33%) Female who were trained in VMMC. After comparing the demographic characteristics against Training status, it had significant differences across Age (years), Gender and Years of experience. However, there was no significant differences across Qualification, Occupation and Health Facility.

Table 2: Analysis on proportion of Health care practitioners

Variables	Trained in medical male circumcision services		Total	p value
	Yes	No		
Age (years)				0.0073*
20-24 years	0	6	6	
	0.00	100.00	100.00	
	0.00	6.74	6.74	
25-29 years	0	34	34	
	0.00	100.00	100.00	
	0.00	38.20	38.20	
30-34 years	7	23	30	
	23.33	76.67	100.00	
	7.87	25.84	33.71	
35-40 years	2	10	12	
	16.67	83.33	100.00	
	2.25	11.24	13.48	
Above 40 years	3	4	7	
	42.86	57.14	100.00	
	3.37	4.49	7.87	
Gender				0.0002*
Female	1	50	51	
	1.96	98.04	100.00	
	1.12	56.18	57.30	
Male	11	27	38	
	28.95	71.05	100.00	
	12.36	30.34	42.70	

Occupation				0.1063
Community Health assistant	0	9	9	
	0.00	100.00	100.00	
	0.00	10.11	10.11	
Clinicians	3	6	9	
	33.33	66.67	100.00	
	3.37	6.74	10.11	
Nurses and Midwives	9	62	71	
	12.68	87.32	100.00	
	10.11	69.66	79.78	
Qualification				0.0596
Certificate	2	18	20	
	10.00	90.00	100.00	
	2.25	20.22	22.47	
Diploma	7	55	62	
	11.29	88.71	100.00	
	7.87	61.80	69.66	
Degree	3	4	7	
	42.86	57.14	100.00	
	3.37	4.49	7.87	
Years of experience				0.0033*
2-6 years	0	7	7	
	0.00	100.00	100.00	
	0.00	7.87	7.87	
7-11 years	3	3	6	
	50.00	50.00	100.00	
	3.37	3.37	6.74	
12-15 years	2	44	46	
	4.35	95.65	100.00	
	2.25	49.44	51.69	

16-20 years	7	23	30	
	23.33	76.67	100.00	
	7.87	25.84	33.71	
Health Facility				0.3307
Health post	2	25	27	
	7.41	92.59	100.00	
	2.25	28.09	30.34	
Hospital	5	34	39	
	12.82	87.18	100.00	
	5.62	38.20	43.82	
Rural health center	5	18	23	
	21.74	78.26	100.00	
	5.62	20.22	25.84	

Key: First row has *frequencies*; second row has *row percentages* and third row has *cell percentages*

* Pearson’s Chi-square (and Fischer’s exact) test showed statistical significant difference between Gender and Attitude.

Table 3 Shows the distribution of knowledge level according to demographic characteristic of healthcare worker. A total of 91 participants knowledge level were recorded and a good score of 60 (65.93%) was found. After comparing the Variables against Knowledge outcome, the scores had a significant different across Gender and Health facility. Those that had Good Knowledge levels were 31 (34.07%) Male and 29 (31.87%) Female. Those that had Poor Knowledge were 53 (58.24%) Female and 38 (41.76%) Males with a P-value = 0.0284. After comparing Facility of respondent with Knowledge levels, those with good knowledge 26 (28.57%) were from the Hospital, 21 (23.08%) Rural health Center and 13 (14.29%) Health posts. Healthcare workers with poor Knowledge level were 8 (8.79%) from Health post and 6 (6.59%) Hospital. P-value = 0.014448 (52.75%) Nurses and Midwife were more well knowledgable than Clinicians and Community health assistant, but there was no any statistical association across Occupation.

Table 3: Analysis on the Knowledge of VMMC Services

Variables	Knowledge level of Healthcare workes			Total	p value
	Good	Avarage	Poor		
Age (years)					0.3630
20-24 years	2	3	1	6	
	33.33	50.00	16.67	100.00	
	2.20	3.30	1.10	6.59	
25-29 years	20	8	7	35	
	57.14	22.86	20.00	100.00	

	21.98	8.79	7.69	38.46	
30-34 years	23	4	4	31	
	74.19	12.90	12.90	100.00	
	25.27	4.40	4.40	34.07	
35-40 years	9	1	20.00	100.00	
	75.00	8.33	2	12	
	9.89	1.10	16.67	100.00	
Above 40 years	6	1	0	7	
	85.71	14.29	0.00	100.00	
	6.59	1.10	0.00	7.69	
Gender					0.0284*
Female	29	13	11	53	
	54.72	24.53	20.75	100.00	
	31.87	14.29	12.09	58.24	
Male	31	4	3	38	
	81.58	10.53	7.89	100.00	
	34.07	4.40	3.30	41.76	
Occupation					0.6990
Community Health assistant	5	2	2	9	
	55.56	22.22	22.22	100.00	
	5.49	2.20	2.20	9.89	
Clinicians	7	2	0	9	
	77.78	22.22	0.00	100.00	
	7.69	2.20	0.00	9.89	
Nurses and Midwives	48	13	12	73	
	65.75	17.81	16.44	100.00	
	52.75	14.29	13.19	80.22	
Qualification					0.1060
Certificate	9	7	5	21	
	42.86	33.33	23.81	100.00	
	9.89	7.69	5.49	23.08	
Diploma	45	9	9	63	

	71.43	14.29	14.29	100.00	
	49.45	9.89	9.89	69.23	
Degree	6	1	0	7	
	85.71	14.29	0.00	100.00	
	6.59	1.10	0.00	7.69	
Years of experience					0.7104
2-6 years	29	9	10	48	
	60.42	18.75	20.83	100.00	
	31.87	9.89	10.99	52.75	
7-11 years	22	5	3	30	
	73.33	16.67	10.00	100.00	
	24.18	5.49	3.30	32.97	
12-15 years	5	1	1	7	
	71.43	14.29	14.29	100.00	
	5.49	1.10	1.10	7.69	
16-20 years	4	2	0	6	
	66.67	33.33	0.00	100.00	
	4.40	2.20	0.00	6.59	
Health Facility					0.0144*
Health post	13	7	8	28	
	46.43	25.00	28.57	100.00	
	14.29	7.69	8.79	30.77	
Hospital	26	8	6	40	
	65.00	20.00	15.00	100.00	
	28.57	8.79	6.59	43.96	
Rural health center	21	2	0	23	
	91.30	8.70	0.00	100.00	
	23.08	2.20	0.00	25.27	

Key: First row has *frequencies*; second row has *row percentages* and third row has *cell percentages*.

* Pearson's Chi-square (and Fischer's exact) test showed statistical significant difference between Gender and knowledge of VMMC services. And between Health Facility and Knowledge

Table 4 shows responses of knowledge related answers to voluntary medical male circumcision of healthcare workers. 89 (97.80%) had knowledge about VMMC service and 2 (2.20%) did not have knowledge about

VMMC services. Total respondent 91 (100.00%). 12 (13.48%) were trained in VMMC procedure and 77 (86.56%) were not trained. Total respondent, (only those that Knowledge about VMMC service) 89 (100%.00). From a total response of 89 (100.00%), 18 (20.22%) said they had knowledge of VMMC procedure and surgical operations and 71 (79.78%) said they did not Know. Of the 18 that knew how to perform VMMC procedure and operation every respondent 18 (100.00%) had a good score of surgical practice knowledge. 88 (98.88%) had good knowledge score about benefits of VMMC in adults and 1 (1.12%) had a poor knowledge score about VMMC in adults. 69 (77.53%) had good knowledge score about benefits of VMMC in babies and 20 (22.47%) had a poor knowledge score about VMMC in babies. On knowledge of risk associated with the service 56 (62.92%) said yes, 24 (26.97%) said No and 9 (10.11%) did not know if there are any risks.

Table 4: Frequency table of knowledge related responses about VMMC.

Variables	Freq.	Percent	Cum.
Have Knowledge about VMMC services			
No	2	2.20	2.20
Yes	89	97.80	100.00
Trained in VMMC procedure			
No	77	86.52	86.52
Yes	12	13.48	100.00
Knowledge of VMMC procedure			
No	71	79.78	79.78
Yes	18	20.22	100.00
Surgical practice score			
Good	18	100.00	100.00
VMMC service knowledge score			
Good	67	75.28	75.28
Poor	22	24.72	100.00
Heard about scaling up VMMC services			
No	30	33.71	33.71
Yes	59	66.29	100
Knowledge of indications for VMMC			
Good	68	76.40	76.40
Poor	21	23.60	100.00
Knowledge of Benefits of VMMC in adults			

Good	88	98.88	98.88
Poor	1	1.12	100.00
Knowledge of benefits of VMMC in babies			
Good	69	77.53	77.53
Poor	20	22.47	100.00
Knowledge on risks associated with VMMC			
Do not know	9	10.11	10.11
No	24	26.97	37.08
Yes	56	62.92	100.00

Table 5 represents the attitude of healthcare workers who do not know how to perform circumcision operations, this excludes 2 respondents who did not know about VMMC services. From a total of 69 respondents, it was found that 63 (91.30%) had positive attitude and 6 (8.70%) Negative.

Table 5: Tabulation of attitude of non-MC providers

Attitude of non MC providers	Freq.	Percent	Cum.
Negative	6	8.70	8.70
Positive	63	91.30	100.00
Total	69	100.00	

Table 6 shows the attitude of Mc providers. The attitude of Mc providers was analysed and found to be 19 (95.00%) positive and 1 (5.00%) Negative attitude to VMMC Service. The attitude score was significantly different withing the gender of respondents, p-value-0.000. However, there were no statistical differences in the attitude score across Age (years), Occupation, Qualification, Years of experience and Health Facility.

Table 6: Analysis of MC providers Attitude

Variables	Attitude of MC providers		Total	p value
	Positive	Negative		
Age (years)				0.4313
20-24 years	4	1	5	
	80.00	20.00	100.00	
	22.22	5.56	27.78	
25-29 years	5	0	5	
	100.00	0.00	100.00	
	27.78	0.00	27.78	
30-34 years	3	0	3	

	100.00	0.00	100.00	
	16.67	0.00	16.67	
35-40 years	5	0	5	
	100.00	0.00	100.00	
	27.78	0.00	27.78	
Above 40 years	4	1	5	
	80.00	20.00	100.00	
	22.22	5.56	27.78	
Gender				0.0000*
Female	0	1	1	
	0.00	100.00	100.00	
	0.00	5.56	5.56	
Male	17	0	17	
	100.00	0.00	100.00	
	94.44	0.00	94.44	
Occupation				0.7140
Community Health assistant	3	0	3	
	100.00	0.00	100.00	
	16.67	0.00	16.67	
Clinicians	4	0	4	
	100.00	0.00	100.00	
	22.22	0.00	22.22	
Nurses and Midwives	10	1	11	
	90.91	9.09	100.00	
	55.56	5.56	61.11	
Qualification				0.6547
Certificate	6	0	6	
	100.00	0.00	100.00	
	33.33	0.00	33.33	
Diploma	9	1	10	

	90.00	10.00	100.00	
	50.00	5.56	55.56	
Degree	2	0	2	
	100.00	0.00	100.00	
	11.11	0.00	11.11	
Years of experience				0.7236
2-6 years	1	0	1	
	100.00	0.00	100.00	
	5.56	0.00	5.56	
7-11 years	2	0	2	
	100.00	0.00	100.00	
	11.11	0.00	11.11	
12-15 years	7	1	8	
	87.50	12.50	100.00	
	38.89	5.56	44.44	
16-20 years	7	0	7	
	100.00	0.00	100.00	
	38.89	0.00	38.89	
Health Facility				0.4682
Health post	1	0	1	
	100.00	0.00	100.00	
	5.56	0.00	5.56	
Hospital	10	0	10	
	100.00	0.00	100.00	
	55.56	0.00	55.56	
Rural health center	6	1	7	
	85.71	14.29	100.00	
	33.33	5.56	38.89	

Key: First row has *frequencies*; second row has *row percentages* and third row has *cell percentages*

* Pearson's Chi-square (and Fischer's exact) test showed statistical significant difference between Gender and Attitude.

Table 7 presents healthcare workers attitude related answers regarding voluntary male medical circumcision services. 53 (94.64%) perceived likelihood of risks of VMMC as less likely, 2 (3.57%) had an attitude of perceiving risk as more likely. From a total 71 respondents, (Who responded No to Knowledge of VMMC procedure), 59 (83.10%) were willing to train in VMMC and 12 (16.90%) were not willing.

Of the 78 (87.64%) were willing to Provide VMMC service to adult and 11 (12.36%) were not. 67(75.28%) were willing to offer the service of Circumcision to babies and 22 (24.72%) responded were not. From total of 12 respondents (who responded no to Participation in past 12 months) 10 (83.33%) had a positive reason to why they did not provide VMMC services and 2 (16.67%) had a negative reason.

Table 7: Frequence table on the attitude of Healthcare workers on VMMC services

Variables	Freq.	Percent	Cum.
Likelihood of risks of VMMC			
Less likely	53	94.64	94.64
Likely	1	1.79	96.43
More Likely	2	3.57	100.00
Willing to training in VMMC			
No	12	16.90	16.90
Yes	59	83.10	100.00
Willingness to provide VMMC to adults	77	86.52	86.52
No	11	12.36	12.36
Yes	78	87.64	100.00
Attitude on prevention of risks			
Negative	3	7.14	7.14
Positive	39	92.86	100.00
Willingness to provide VMMC to infants			
No	22	24.72	24.72
Yes	67	75.28	100.00
Reasons for not providing VMMC at facility			
Negative	2	16.67	16.67
Positive	10	83.33	100.00

Table 8 shows the frequency of respondents in relation to their practice of VMMC. Total of 18 respondents who had knowledge of performing Mc to variables in the table. 6 (33.33%) responded yes to participation in 12 months and 12 (66.67%) responded No.

Total of 6 participants who responded yes to Participation in past 12 months were variable respondents to Participation in VMMC services. 4 (66.67%) responded Regular and 2 (33.33%) responded not often.

7 (38.89%) answered Yes to Offers VMMC outreach activity variable and 11 (61.11%) responded No. Total responses 18.

4 (22.22%) scheduled Booking and daily clinic services for VMMC and 14 (77.78%) scheduled service for Booking appointments.

Table 8: Frequency response of participants related to Practice

Variables	Freq.	Percent	Cum.
Participation in past 12 months			
No	12	66.67	66.67
Yes	6	33.33	100.00
Participation in VMMC services			
Not often	2	33.33	33.33
Regular	4	66.67	100.00
Offers VMMC outreach activities			
No	11	61.11	61.11
Yes	7	38.89	100.00
VMMC Service schedule			
Booking	14	77.78	77.78
Booking Daily clinic	4	22.22	100.00

Qualitative Analysis

Knowledge of VMMC Services among Healthcare Workers

Healthcare workers 18 (100.00%) scored good on how to conduct a VMMC services and operations, most notably they said that it begins with On-site services such as counseling services at MC before and after the operation. HIV testing and counseling services, Medical Care Services, and the regular treatment of STIs and Services for men's reproductive health, however 14 (77.78%) could not fully describe desired or category B services VMMC services.

With regard to how to perform an operation, the respondents accounts were recorded in two themes, dorsal slit and forceps guided. 12 said the operation is done by marking the end of the glance on the foreskin, making a slit up to the mark and cut the foreskin around the glance. 6 said by marking the end of the glance on the foreskin pulling the foreskin and placing a forceps on the mark and cutting the foreskin above the forceps.

“The client is positioned on a surgical bed for the treatment. Foreskin and penis are cleaned. Administer anesthetic injection, mark the foreskin around the glance. The foreskin is chopped off and pulled away while a clamp is fastened to the penis. Following the operation, close the layers with sutures and dress the wound with petroleum gauze to prevent it from rubbing against clothing” (Clinician).

“So, the first thing is to allow your client to lay on a flat surface, you clean around with iodine solution then you block the penile dorsal nerves, make a visible mark around the foreskin to identify were the glance ends, you then pull the foreskin upwards and put a clamp on the mark and cut off the foreskin immediately above the clamp. Then end the operation by closing the skin” (Nurses and Midwives).

Of 18 respondents, majority 13 (72.2%) of healthcare workers had good knowledge of Benefits of VMMC in adults and Knowledge of benefits of VMMC in babies most notably Clinicians and Nurses and Midwives mentioned a list of benefits with themes prevention and Hygiene. *“Circumcision reduces HIV transmission by 50 to 60 percent in men, can prevent high chances of STIs and transmitting HPV to a partner and important for hygiene,” (Nurses and Midwives).* Healthcare workers mentioned that circumcision prevents phimosis, paraphimosis and hygiene in babies.

Attitude of Healthcare Workers on VMMC Services

majority 12 gave reasons for not providing VMMC at facility. 11 (55.56%) expressed interest and sited lack of surgical instruments to use, culture and insufficient training. 1(5.55%) said that there was no interest of providing the service.

“Mostly because of culture, circumcision is common from July up to September, but we have to compete for clients with traditional male circumcision providers. So, it is not common to circumcise clients at any other point of the year no matter how much I make myself available” (Nurse and Midwives).

“If they can provide us with basic surgical instruments and adequate space, it would be interesting to do all the operations from here,” (Clinician).

Practices Involved In VMMC Provision Among Healthcare

18 from the 71 respondents who did not know how to circumcise were asked about their practices. 13(72.22%) said they refer the clients, 2 (5.56%) will only offer IEC to the clients 3(16.67%) refused.

“I usually refer to my workmate and sometimes to the district hospital when my colleague is on leave” (Clinicians).

“If we have anyone who want to be circumcised, we put them on a theatre list or directly refer them there depending on the availability of human resource” (Nurses and Midwives).

“I tell them am not a circumcision provider, ...that is all, most of them know by now” (Nurses and Midwives).

DISCUSSION OF FINDINGS

The study aimed to assess the Knowledge levels attitude and practices toward the promotion of VMMC services among service providers in Mufumbwe, a district of the North-western province.

The data suggest that though very few health care workers had undergone professional training in VMMC services and almost all health care workers had a high level of understanding of the service. However, they did not understand how to integrate category B or deired services. The results showed that most health care workers had good perception about different aspect related to VMMC. Among those that were trained, it was found that VMMC was strictly done clinically and mostly regularly. The research shows that with the challenges, health care practitioners shared responsibilities by ways of referrals or schedule for an appointment with a client on a later date to create time for preparations.

A huge proportion of health workers were untrained. Concerns about human resources are one barrier to expanding VMMC services. To eventually reach a steady state that will place fewer demands on the healthcare system, scaling up VMMC requires a focused campaign strategy and quick mobilization of human resources. Gains in efficiency, whether surgical or non-surgical, have a major impact on operation costs and, as a result, the quantity of medical male circumcisions that can be performed (Hankins, Forsythe & Njehumeli 2011) . The

analysis identifies age, gender and years of professional work experience significantly as key factor to undergo VMMC training. The majority of health care workers that had been trained were males than women, Similar to the findings of (Nxumalo, Mchunu & Nxumalo 2021) were, Female personnel' opinions had been shaped by their participation in and awareness of this sociocultural value system and being involved mad a man feel somewhat disrespected, which could make him reluctant to have a medical Circumcision. circumcision was linked to traditional gender-specific rites of passage. New insight on the influence of age and years of experience reviewed that those within the age group 30-34 were more likely to have undergone training and having worked for 12-15 years made one to have more chances to be trained in VMMC.

Most health care workers explained that pre-and post-operative counseling, HIV counseling and testing, surgical treatments, routine STI treatment, condom distribution, and men's reproductive health care are part of VMMC service varying knowledge across gender and work stations or facility levels. HCPs in most facilities strictly follow the VMMC protocol; from HIV counseling and testing (HCT) on each client requesting VMMC services in accordance with the VMMC guidelines of the Country (Skolnik et al., 2014). Though health care workers had knowledge about VMMC most of them were less knowledgeable about category B services or desirable services. Because of the (Health Professions Council of Zambia, 2010) advise that HCPs provide accurate and unbiased services to clients and patients, our results showing overall understanding of VMMC is variable are significant.

Pediatric clinicians had better general VMMC knowledge compared to other health workers Starzyk et al. (2015). In this study nurses and Midwives were more Knowledgeable than other healthcare workers, though not significant. The findings were significant that males were more knowledgeable than female, and working from a hospital was significantly related to being Knowledgeable. The lowest number of workers who were knowledgeable were found to be stationed in rural health centers.

All males having a positive attitude than the female gender was a significant finding.

A prominent representation of non-VMMC service provider among healthcare workers thought it would be uncommon for risk to occur either in adults of in little children and babies following the operation, Female health workers claimed to have conflicting opinions on the nature of the procedure, particularly in regard to the safety of male patients in light of the perceived inherent difficulties associated with VMMC surgeries (Nxumalo & Mchunu 2020). However, the current sturdy contradicted Dévieux et al., 2015 that healthcare workers had a dim view of MC in infants under 1-year-old because of a misperception that Mc totally protects HIV infection.

The majority of non VMMC providers expressed willingness to be trained in VMMC service. Health workers said Translation of scientific data into clinical practice frequently delays, but a number of factors can hasten the process, including a core group of clinicians eager to take the lead. Training programs would be well-received to ensure that they completely integrate training into clinical practice (Sheldon et al. 2012).

MC providers were eager to provide MC however cited impediments to the service as lack of surgical instruments and adequate space and unexpectedly, culture, in a sense that most clients preferred traditional as it suited their culture.

Providing mc was not found to be common among MC providers, more than half of the did not perform the the operation in a continuous space of 4quater. Most of the few that did however, regularly offered the service. When the service is fully on offer, few would perform MC in outreach cite during the circumcision period. According to health workers, fixed and outreach sites should offer VMMC services to promote access. And they think that if facilities are short on space, mobile sites are preferable to offer counseling, testing, and other services (Ashengo et al., 2014).

Most MC providers did not provide immediate surgical services instead the made appointments date with the client. A few that provided immediate services also employed setting appointment dates to suit the clients need.

The practice of non-MC providers mostly referring the clients to the next level of care such as health post to health center or hospital. Other made internal referrals to MC providers within the facility. Collaboration between healthcare professionals is essential for the VMMC program to be successful. MCs were carried out more frequently in Zimbabwe during campaigns and inter-facility participation (64%) than during routine service delivery (36%) despite the fact that they prefer to undertake surgical operations in hospitals for infection control reasons (Ashengo et al., 2014)

CONCLUSIONS AND RECOMMENDATION

This chapter will conclude the study by summarising the key research findings in relation to the research aims and research questions, as well as the value and contribution thereof. It will also review the limitations of the study and propose opportunities for future research.

The study aimed to assess the Knowledge levels attitude and practices toward the promotion of VMMC services among service providers. The results indicate that very few health care workers had undergone professional training in VMMC services but almost all had a high level of understanding of the services. However, they did not understand how to integrate category B or desired services in VMMC services. Further findings show that most health care workers had good perception about different aspect related to VMMC. They believed it was a low-risk operation after the surgery had been performed and were willing to be trained and to offer the service to clients of all ages. The study reviewed that Practically, Health care workers shared responsibilities by ways of referrals or schedule for an appointment with a client on a later date to create time for preparations. VMMC was strictly done clinically and mostly regularly by very few providers. In order to improve upon their current knowledge and clear up any potential ambiguities, A review of providers' current training is necessary. It is essential to make sure that healthcare professionals receive training and information about the effectiveness of medical male circumcision. Although the results of this study imply that male circumcision is acceptable and that healthcare professionals are willing to undergo MMC training; nevertheless, further research with more substantial and representative sample sizes is required to corroborate these results. This study is significant because it establishes a benchmark for comparing existing knowledge levels, and more research is required to assess whether healthcare professionals are currently appropriately trained for the ambitious medical male circumcision program.

Limitations

The study's sample size was small, we failed to reach the total sample size, so results cannot be extrapolated outside this area. However, the data were rich and contained details that are helpful to take into account and guide suggestions for healthcare providers working in a Zambian rural district context.

REFERENCES

1. Ashengo, T.A. et al. 2014. Voluntary Medical Male Circumcision (VMMC) in Tanzania and Zimbabwe: Service delivery intensity and modality and their influence on the age of clients. *PLoS ONE* 9(5). doi: 10.1371/journal.pone.0083642.
2. Brito, M.O., Luna, M. and Bailey, R.C. 2010. The feasibility and acceptability of male circumcision among men, women, and health providers of the Altagracia Province, Dominican Republic. *AIDS Care – Psychological and Socio-Medical Aspects of AIDS/HIV* 22(12), pp. 1530–1535. Doi: 10.1080/09540121.2010.484455.
3. Carbery, B., Zhu, J., Gust, D.A., Chen, R.T., Kretsinger, K. and Kilmarx, P.H. 2012. NEED FOR PHYSICIAN EDUCATION ON THE BENEFITS AND RISKS OF MALE CIRCUMCISION IN THE UNITED STATES. *AIDS Education and Prevention* 24(4), pp. 377–387. Available at: www.epocrates.com (Accessed: 7 March 2022).
4. Cohen, L., Manion, L. and Morrison, K. 2002. *Research Methods in Education*, Sixth Edition.
5. Davis, S.M., Baker, H., Gross, J.M., Leslie, S.L., Chasokela, C.M.Z., Samuelson, J. and Toledo, C. 2021. The Role of Nurses and Midwives in Expanding and Sustaining Voluntary Medical Male Circumcision Services for HIV Prevention: A Systematic and Policy Review. *The Journal of the Association of Nurses in AIDS Care: JANAC* 32(1), pp. 3–28. doi: 10.1097/JNC.0000000000000222.

6. Dévieux, J.G. et al. 2015. Knowledge, attitudes, practices and beliefs about Medical Male Circumcision (MMC) among a sample of health care providers in Haiti. *PLoS ONE* 10(8). doi: 10.1371/journal.pone.0134667.
7. Gostin, L.O. and Hankins, C.A. 2008. Male circumcision as an HIV prevention strategy in sub-Saharan Africa: Sociolegal barriers. *JAMA - Journal of the American Medical Association* 300(21), pp. 2539–2541. doi: 10.1001/jama.2008.752.
8. International partners call for accelerated access to voluntary medical male circumcision in eastern and southern Africa 2011. Available at: www.pepfar.gov (Accessed: 18 January 2022).
9. Kesmodel, U.S. 2018. Cross-sectional studies – what are they good for? *Acta Obstetrica et Gynecologica Scandinavica* 97(4), pp. 388–393. doi: 10.1111/aogs.13331.
10. Kothari, C.R. 2004. *Research methodology: methods & techniques*. New Age International (P) Ltd.
11. Langins, M. and Borgermans, L. 2015. Strengthening a competent health workforce for the provision of coordinated/integrated health services.
12. Mavhu, W. et al. 2014. Provider attitudes toward the voluntary medical male circumcision scale-up in Kenya, South Africa, Tanzania and Zimbabwe. *PLoS ONE* 9(5). doi: 10.1371/journal.pone.0082911.
13. McEachan, R., Taylor, N., Harrison, R., Lawton, R., Gardner, P. and Conner, M. 2016. Meta-Analysis of the Reasoned Action Approach (RAA) to Understanding Health Behaviors. *Annals of Behavioral Medicine* 50(4), pp. 592–612. doi: 10.1007/s12160-016-9798-4.
14. Milford, C., Rambally, L., Mantell, J.E., Kelvin, E.A., Mosery, N.F. and Smit, J.A. 2016. Healthcare providers' knowledge, attitudes and practices towards medical male circumcision and their understandings of its partial efficacy in HIV prevention: Qualitative research in KwaZulu-Natal, South Africa. *International Journal of Nursing Studies* 53, pp. 182–189. doi: 10.1016/j.ijnurstu.2015.07.011.
15. Ministry of Health, Z. 2009. *Male Circumcision Situation Analysis: A Report on the National Male Circumcision Situation Analysis Conducted by the Ministry of Health and Co-operating Partners*.
16. Neuman, W.L., William L. 2014. *Social research methods: qualitative and quantitative approaches*.
17. Nxumalo, C.T., Mchunu, G.G. and Nxumalo, C. 2021. *South African Family Practice*. Available at: <https://doi.org/10.4102/safp> (Accessed: 21 February 2022).
18. Schilling, J. 2006. On the pragmatics of qualitative assessment designing the process for content analysis. *European Journal of Psychological Assessment* 22(1), pp. 28–37. doi: 10.1027/1015-5759.22.1.28.
19. Skolnik, L., Tsui, S., Ashengo, T.A., Kikaya, V. and Lukobo-Durrell, M. 2014. A cross-sectional study describing motivations and barriers to voluntary medical male circumcision in Lesotho. Available at: <http://www.biomedcentral.com/1471-2458/14/1119> (Accessed: 24 February 2022).
20. Starzyk, E.J., Kelley, M.A., Caskey, R.N., Schwartz, A., Kennelly, J.F. and Bailey, R.C. 2015. Infant male circumcision: Healthcare provider knowledge and associated factors. *PLoS ONE* 10(1). doi: 10.1371/journal.pone.0115891.
21. Titus, M.J. and Moodley, J. 2011. Male Circumcision as a Public Health Measure for the Prevention of HIV Transmission. *Southern African Journal of Epidemiology and Infection* 26(4), pp. 262–265. doi: 10.1080/10158782.2011.11441464.
22. *Transition and Sustainability Plan for the Zambia Voluntary Medical Male Circumcision (VMMC) Programme* Transition and Sustainability Plan for the Zambia VMMC Programme 2019.
23. Weiss, Helen., World Health Organization., Joint United Nations Programme on HIV/AIDS. and London School of Hygiene and Tropical Medicine. 2008. *Male circumcision: global trends and determinants of prevalence, safety, and acceptability*. World Health Organization.
24. Windhoek, N. 2009. *Country experiences in the scale-up of male circumcision in the Eastern and Southern Africa Region: Two years and counting A sub-regional consultation*.
25. Zarei, N., Joulaei, H., Darabi, E. and Fararouei, M. 2015. Stigmatized Attitude of Healthcare Providers: A Barrier for Delivering Health Services to HIV Positive Patients.