

**Knowledge, attitude and perception of university students regarding Medical Male
Circumcision at the University of Venda, South Africa**

By

Tshiko Frank Matlala

Student number: 17009285

A mini-dissertation submitted in partial fulfilment of the requirements

for the degree of

MASTERS IN PUBLIC HEALTH

at the

UNIVERSITY OF VENDA

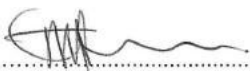
Supervisor: Dr Mabunda JT

Co-Supervisor: Mr Manganye B.S

April 2021

DECLARATION

I, Tshiko Frank Matlala17009285, hereby declare that the mini-dissertation titled '**Knowledge, attitude and perception of university students regarding Medical Male Circumcision at the University of Venda, South Africa**' is my work and has not been submitted for any degree at this University or any other institution. All citations and material in additional sources have been duly acknowledged and referenced accordingly.

Signature... 

Date:27.04.2021

DEDICATION

This piece of work is dedicated to

my late dad

Matome Alpheus Matlala

Who wanted me to be the best I can be.

ACKNOWLEDGEMENTS

- I would like to express my deepest gratitude to my Supervisor Dr JT Mabunda for her tireless support and patience. This has been a long and tough journey which we walked together with dedication. This study would not have been a success without her guidance and continuous constructive input.
- My thanks go to my friend, part-time lecturer and mentor, Dr P Mambanga for being a source of strength and encouragement during the course of this study.
- I also wish to thank my family for allowing the time to focus on this study, your support has been the pillar of this study.
- I am grateful for the assistance and guidance I got from the Aurum Institute team of clinicians (Dr Dino Rech and Dr Josephine Otchere-Darko), their input has been extremely valuable.
- To the University of Venda Public Health department, I really appreciate the opportunity you awarded me to pursue this study under your umbrella.
- To the University of Pretoria COPC Research Unit team member for their continuous support and encouragement.
- My mentee at Anglo American Platinum COPC project who always looked up to me and encouraged me to remain focused on this study.
- To all the participants of this study from the University of Venda On-campus Residence, who volunteered their time and valuable information, I thank you all from the bottom of my heart.

LIST OF ACRONYMS AND ABBREVIATIONS

ABC	Abstain, Be faithful, Condomise
AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral therapy
CDC	Centres for Disease Control and Prevention
HBM	Health Belief Model
HEAIDS	Higher Education and Training Health, Wellness
HIV	Human Immune Virus
HPV	Human Papilloma Virus
MC	Male Circumcision
MEC	Member of the Executive Council
MMC	Medical Male Circumcision
NDoH	National Department of Health
SPSS	Statistics Product and Services Solutions
STI	Sexually Transmitted Infection
UNAIDS	The Joint United Nations Programme on HIV and AIDS
USA	United States of America
VMMC	Voluntary Medical Male Circumcision
WHO	World Health Organization

ABSTRACT

Background: There is convincing evidence that Medical Male Circumcision is associated with a reduced risk of contracting the Human Immune-Deficiency Virus and other heterosexual infections and diseases. However, the rate of MMC is fluctuating, and studies have indicated that this is due to knowledge, attitudes, and perceptions of individuals towards Medical Male Circumcision.

Aim: The study aimed to assess the knowledge, attitudes, and perceptions of the University of Venda students regarding medical male circumcision.

Methodology: A quantitative cross-sectional descriptive study design was used. The population of this study were all university students (both females and males) residing in the University of Venda campus as of January 2020, where a sample of 327 students was drawn systematically from residential halls. Slovin's formula was used to determine the sample size. The systematic random sampling was used to select rooms from which respondents were chosen. A self-administered questionnaire was provided in English without translation. It comprised of four sections, namely, demography, knowledge, attitudes, and perceptions regarding Medical Male Circumcision. The face validity was ensured by the supervisor, and the experts in MMC were consulted to review the questionnaire in which some comments were raised in terms of language and terminology. To ensure the reliability of the questionnaire, the statistical product and service solution Cronbach's Alpha method was employed wherein items on the Likert scale variables were selected and analysed for internal consistent of the tool. The researcher conducted a pre-test among 60 (18% of the sample of the main study) off campus students who are not part of the study however they share similar characteristics. The sample was made up of 28 males and 32 females students. Descriptive statistics using the statistical product and services solutions version 25.0 were used to analyze the collected data. Descriptive statistics of the demographic characteristics, and scores for the level of knowledge, attitudes, and perceptions regarding MMC were presented. Chi square tests and cross tabulation were used to determine the associations between knowledge, attitudes and practices reading MMC and the socio-demographic characteristics of respondents. The level of significance was set at 0.05. Throughout the study the principles of ethical considerations which include permission to carry out the study, anonymity, privacy and informed consent was ensured.

Results: The study findings showed that majority of respondents generally have average knowledge and negative attitudes and misperceptions regarding MMC, hence the need for more education regarding MMC in order to change behaviour towards MMC.

Conclusion and Recommendations: Overall, the knowledge regarding MMC was average particularly its potential to reduce the risk of HIV infection, Sexual Transmitted Infection and enhance penile hygiene exists, with many displaying poor or lack of knowledge on circumcision. Given that information obtained from this study provides insight on knowledge, attitudes and perceptions towards MMC at University of Venda. Despite the average knowledge regarding MMC which might have resulted in negative attitude and misperceptions, it was further noted that barriers to effective implementation still exist and these barriers include the fear of pain associated with the procedure, the fear of complications. However, findings from this study would be useful to health policy makers in the design of health education programs to improve the MMC program in tertiary institutions.

Keywords; Attitudes, Circumcision, Knowledge, Medical, Perceptions, University of Venda

Contents

DECLARATION.....	i
DEDICATION.....	ii
ACKNOWLEDGEMENTS	iii
LIST OF ACRONYMS AND ABBREVIATIONS	iv
ABSTRACT.....	v
LIST OF FIGURES.....	xi
LIST OF TABLES.....	xii
CHAPTER 1	1
ORIENTATION OF THE STUDY.....	1
1.1 Introduction and background of the study	1
1.2 Statement of the problem.....	4
1.3 Rationale and significance of the study	5
1.3.1 Rationale of the study.....	5
1.3.2 Significance of the study.....	5
1.4 Study purpose and objectives	6
1.4.1 Purpose of the study	6
1.4.2 Objectives of the study	6
1.5 Definitions of key terms.....	6
1.6 Theoretical framework- Health Belief Model.....	7
1.7. Outline of the chapters.....	9
1.8. Conclusion.....	10
CHAPTER 2.....	11
LITERATURE REVIEW	11
2.1 Introduction.....	11
2.2 Origin of Circumcision as a practice.....	11
2.3 Global view in MMC	12
2.4 Circumcision in Africa and Sub-Saharan Africa.....	14
2.5 Circumcision and HIV in South Africa	15

2.6 Knowledge of MMC	16
2.7 Attitudes towards MMC	18
2.8 Perception regarding MMC	19
2.9. Conclusion.....	21
CHAPTER 3.....	22
METHODOLOGY	22
3.1. Introduction.....	22
3.2 Study Design	22
3.3. Study Setting	22
3.4 The study population and sampling.....	22
3.4.1 Population	23
3.4.2 Sampling	23
3.5 Data collection tool	25
3.6. Pre-testing of the instrument.....	26
3.7. Data collection plan	26
3.8. Data analysis	27
3.9. Validity and reliability	27
3.9.1 Validity of the study	27
3.9.2 Reliability.....	27
3.10. Ethical considerations.....	28
3.10.1 Institutional approval and permission.....	28
3.10.2 Informed consent and voluntary participation	28
3.10.3. Confidentiality and anonymity.....	28
3.11 Dissemination plan for study findings.....	28
3.12. Conclusion.....	29
CHAPTER 4.....	30
RESULTS AND INTERPRETATION	30
4.1 Introduction.....	30
4.2 Section A: Demographic Characteristics of the study participants.....	30

4.2.1. Residential distribution	31
4.2.2 Cultural affiliation and Country of origin of respondents.....	31
4.3. Section B: Knowledge regarding MMC	32
4.4. Section C: Attitude toward MMC	33
4.5. Section D: Perception regarding MMC	33
4.6. Statistical tests.....	34
4.6.1 Knowledge regarding MMC and gender	35
4.6.2 Attitude towards MMC and cultural affiliation	36
4.6.3 Academic level and perceptions regarding MMC	37
4.7. Conclusion.....	37
CHAPTER 5.....	38
DISCUSSION OF STUDY FINDINGS	38
5.1. Introduction.....	38
5.2. Knowledge, Attitudes, and Perceptions regarding MMC	38
5.3. Conclusion.....	41
CHAPTER 6.....	42
SUMMARY, LIMITATIONS, RECOMMENDATIONS AND CONCLUSION	42
6.1. Introduction.....	42
6.2. Background of the study	42
6.3. Summary of the study	42
6.4. Study Limitation	43
6.5. Recommendations.....	43
6.5.1 Recommendation for practice.....	43
6.5.2 Recommendation for policy	44
6.5.3 Recommendation for further studies.....	44
6.6 Conclusion.....	44
7. REFERENCES.....	45
8. APPENDICES.....	53
APPENDIX A : QUESTIONNAIRE ON MMC.....	53

APPENDIX B: INFORMATION LETTER	57
APPENDIX C: CONSENT FORM.....	59
APPENDIX D: LETTER REQUESTING PERMISSION FROM STUDENT DIRECTOR	60
APPENDIX E: PERMISSION FROM THE STUDENT WARDEN.....	62
APPENDIX F: ETHICAL CLEARANCE CERTIFICATE	63
APPENDIX G: LANGUAGE EDITTING REPORT	64

LIST OF FIGURES

Figure 1.1	Health Belief Model	8
Figure 4.1	Residential distribution of respondents	31
Figure 4.2	Cultural Affiliation of respondents	32
Figure 4.3	Knowledge regarding MMC	32
Figure 4.4	Attitude towards MMC	33

LIST OF TABLES

Table 3.1	Population Distribution	23
Table 3.2	Composition of the sample	25
Table 4.1	Demographic Information	30
Table 4.2	Perception regarding MMC	34
Table 4.3	Association between gender and knowledge regarding MMC	35
Table 4.4	Association between attitudes towards MMC and cultural affiliation	36
Table 4.5	Association between academic level and perception regarding MMC	37

CHAPTER 1

ORIENTATION OF THE STUDY

1.1 Introduction and background of the study

Male Circumcision (MC), which is practised for social, cultural and medical reasons, is one of the oldest and most common surgical procedures performed globally. It is estimated that one in three males worldwide is circumcised (Morris & Krieger, 2019). Several countries with a high prevalence of HIV are now expanding access to safe male circumcision and the immediate focus of circumcision for HIV prevention is on adolescents and adult men. However, a longer-term HIV prevention strategy is likely to include the provision of neonatal and child circumcision. Information on male medical circumcision practices is therefore needed, not only to guide the further expansion of male circumcision services for long-term HIV prevention, but also to ensure that the procedure is conducted as safely as possible, where it is routinely undertaken for religious or cultural reasons.

According to Morris, Hankins, Banerjee, Lumbers, Mindel, Klaussner and Krieger (2019), the true global MC prevalence is not known precisely and can only be estimated. Nevertheless, some estimates are more reliable than others. More than 22 million voluntary medical male circumcisions were performed in 15 priority African countries (South Africa included) from 2008 to 2018. About half of them were in the past three years, according to a progress brief from UNAIDS and the World Health Organization reports (Grund, Chetty-Makkan, Ginindza, Munyai, KisbeyGreen, Maraisane & Charalambous, 2018). Although the pace of scale-up has increased in recent years, it varies by country and is still not meeting the target of 5 million per year.

Medical Male Circumcision (MMC) is an integral and a comprehensive strategy for Human Immune Virus (HIV) prevention for countries with heterosexually-driven epidemics, and the Republic of South Africa is one of the worst-affected by HIV/Acquired Immune Deficiency Syndrome (AIDS) in the Southern sub-region of Africa (Tsvere & Pedzisai, 2014). MMC has been found to reduce the risk of HIV acquisition in heterosexual men by approximately 48–61% (Milford, Rambally, Mantell, Kelvin, Mosery & Smit, 2016). The promotion of MMC in South Africa has for a longer period been linked to recommendations by World Health Organization/The Joint United Nations Programme on HIV and AIDS (WHO/UNAIDS), that MMC be promoted as part of a comprehensive HIV prevention strategy in countries with generalized heterosexual epidemics and low male circumcision rates (Milford et al., 2016).

A subsequent WHO/UNAIDS Voluntary Medical Male Circumcision (VMMC) strategic framework set a goal of reaching 90% of 10-29-year-olds in priority countries with VMMC by 2021 and to reach this coverage level, 5 million young men in the priority countries will need

to undertake voluntary circumcision every year (Morris & Krieger, 2019). However, mathematical modelling suggests that major changes in VMMC implementation in most countries will be required to reach this target. A study analyzing four feasible scenarios for scaling up VMMC between 2017 and 2021 in Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Uganda, and Zimbabwe, found that Tanzania alone would be likely to reach 90% coverage (Grund et al., 2019). Mozambique, South Africa, and Lesotho were projected as coming close to reaching target coverage in one scenario, with the remaining countries unlikely to meet the target in any of the scenarios assessed (Morris & Krieger, 2019).

Cultural circumcision of males, as part of coming of age rituals, is common in a substantial proportion of countries in eastern and southern Africa, thus contributing to the high proportion of circumcised males. However, statistics in some parts of these countries is not well-documented. Estimates of MC prevalence in these countries were based on the proportion of people in each country who are indigenous, lacking survey data, but with high adherence to cultural customs concerning MC; the proportion of circumcised indigenous males is much based on assumptions (Lane, Bailey, Luo & Parks, 2018). However, since 2007, the WHO and UNAIDS have recommended Voluntary Medical Male Circumcision as a key component of combining HIV prevention in countries with a high HIV prevalence and low levels of male circumcision (Tsvere & Pedzisai, 2014).

In South Africa, age is a crucial aspect for men who volunteer for circumcision, as it has consequences for the effectiveness of programs. For example, a modelling study in Swaziland suggested that health benefits were more likely if VMMC programs targeted men aged 20–34 years (Mothiba & Bopape, 2019). Voluntary Medical Male Circumcision for HIV prevention in Swaziland and a study in Zimbabwe showed that efficiency gains can be achieved by focusing on males 10–24 years of age, while in Malawi it was found that the government focused on the circumcision of children aged 10–14 years. Furthermore, it was found that uptake of male circumcision for 19- to 26-year-olds (the high-risk group) was slow; just over a third of the clients seeking VMMC were aged 16–18 years, and that only 5% of men older than 35 sought the service (Sangweni, Mavundla & Moabi, 2019). A new school of thought suggests that “deliberately prioritizing young adolescents is likely to achieve national coverage targets more quickly and cost-effectively than continuing to focus on older, harder-to-reach men” (Lane et al., 2018).

Historically, in South Africa by the end of 2011, more than 1.3 million VMMC had been performed for HIV prevention, with nearly a doubling of the number from 2010 to 2011. Despite the recent increased pace, focused efforts are needed to achieve the number of Medical Male

Circumcision for maximum public health impact on HIV and AIDS (Grund et al., 2019). Key challenges include strengthening advocacy at all levels, exploring innovative approaches to service delivery, including the use of medical devices for adult circumcision, improving supply chain logistics, use of limited human resources, and creating demand for services.

Marais, Toefy, Thompsen, Diwan, Skinner, Mofolo, Lenka and Cloete (2019) reported that in 2019 it was estimated that 46.4% of all males over 15 years of age in South Africa had been circumcised, through either a traditional or a medical procedure. However, only 18.6% of males had been circumcised medically. Therefore, the ultimate goal of the South African Government's VMMC program is to reduce HIV incidence, by scaling up MMC to reach 80% of HIV-negative males 15–49 year-olds by 2021 (Marais et al., 2019). Therefore, MMC scaling up is a priority in South Africa. The national MMC program, launched in South Africa in April 2010 (Milford et al., 2016), aimed to circumcise 80% of men 15–49 years (approximately 4.3 million men) by 2015 and to decrease HIV risk in this high prevalence setting. Hoffman et al. (2015) attests that by the end of March 2015, almost five years into the roll-out; approximately 1,900,000 MMCs had been performed nationally as part of the National Department of Health (NDoH) MMC rollout; almost 2.5 million fewer than targeted.

In KwaZulu-Natal, 134,146 men were circumcised in the period 2013–2014, as part of this program. Furthermore, 38% of the targeted circumcisions for the Province during this period, and 30,229 circumcisions were performed in the eThekweni District over this same period but only 22% of the targeted circumcisions for the District during this period (Milford et al., 2016). The HIV prevalence rate in Limpopo Province was at 13.7% by 2017 whereby the least is Western Cape Province with 5.3% and the highest is KwaZulu Natal Province with 25.8% (Statistics South Africa, 2017). The rates remain high especially in institutions of higher and tertiary education, however, very little is known about the profile of men who present themselves for VMMC in Limpopo because the traditional practices are still underreported.

Despite MMC being offered for free at most government health facilities, many families who live in villages far away from public health facilities have great difficulty sending their sons for circumcision, preferring the mountain schools, which take place near their villages during June resulting in incomplete statistics. There is overwhelming evidence that circumcision is one of the most effective strategies in preventing HIV transmission, in addition to ABC (Abstain, being Faithfull and Condom use). Male circumcision is one of the most effective preventive measures, and lack of circumcision has also been associated with increased risk of sexually transmitted genital ulcer, poor penile hygiene, Human Papilloma Virus (HPV) infection, penile cancer and cervical cancer in women with uncircumcised partners (Jeofrey, Zivanai & Gwendoline, 2013). Therefore, if all these are associated with lack of circumcision, then

circumcision becomes paramount and a priority. However, in a bid to scale-up MMC in South Africa, to be a success both in terms of numbers, appropriate knowledge, positive attitude and information are needed to ensure accurate understanding. It is also important to understand healthcare consumer's views and understanding of MMC to positively change attitudes and perceptions regarding circumcision (Tsvere & Pedzisai, 2014). Sengwayo (2011) states that MMC implementation of programs in South Africa is still relatively new and significant knowledge gaps remain about how men, particularly in rural areas, where the programs are just beginning understand MMC. Ikwegbue, Ross, and Ogbonnaya (2015) argue that most studies on MMC have comprised of male respondents and there is correspondingly less literature available on the knowledge and opinions of women about MMC, particularly in Southern Africa. Based on this assertion it is imperative for the present study to be conducted.

The main predictors of support for circumcision revolved around the people's knowledge about the relationship between male circumcision and reduction of acquisition of sexually-transmitted infections, including HIV. Mavhu, Frade, Yongho, Farrell, Hatzold, Machaku, Onyango, Mugurungi, Fimbo, Cherutich and Rech (2014) indicated that higher knowledge is associated with an increased likelihood of MMC support, with favorable and conducive personal perception and attitude towards MMC. Mavhu, Frade, Yongho, Farrell, Hatzold, Machaku, Onyango, Mugurungi, Fimbo, Cherutich and Rech (2014) further elaborate that the rural people have poor actual knowledge about MMC, in which one-third of the female respondents could not recommend circumcision and that 3% of respondents thought that circumcised men were fully protected against HIV. As a result of such misconceptions, women may not request their partners to use condoms during sexual intercourse. It is therefore imperative to explore student knowledge, attitudes and perceptions about MMC.

1.2 Statement of the problem

The chances of contracting HIV and other heterosexual diseases are reduced by MMC. It also assists in lowering the number of people contracting HIV, especially in the general populace. According to studies conducted by HEIADS (Higher Education and Training Health, Wellness and Development Centre) in the KwaZulu Natal Province universities in 2008, the HIV prevalence rate amongst KwaZulu Natal Province university students was at 4.1% for males and 7.8% for females (Durban University of Technology newsletter, 2013). This triggered the implementation of the MMC program in the Durban University of technology intending to reduce the risk of HIV infection amongst students. In the recent period South Africa is experiencing a severe, generalized heterosexually driven HIV epidemic, despite multiple HIV prevention programmes that are being implemented with a confirmed low MMC despite evidence of the protective effect of MC against men and the global and national commitment

to scale up implementation of this prevention method (Morris, Hankins, Banerjee, Lumbers, Mindel, Klaussner & Krieger, 2019).

During the academic registration of University of Venda in January 2017, the researcher visited the university of Venda campus. Upon informal discussions with some students regarding MMC, the researcher found that most uncircumcised men believe in myths which include the reduction of the penis size and sexual performance among others. Therefore, the researcher assumed that the decision of whether to undergo MMC procedure can be influenced by the fear of the unknown; for example, fear of pain during or after surgery as discovered during informal discussions with the university students. To buttress this assumption, the WHO report (2016) also states that most decisions about MMC are determined by the level of knowledge regarding MMC which consequently results in a positive and negative perception and attitude towards MMC. The concern is that some students at the University of Venda might not have information about MMC; as a result, they mostly rely on the above stated myths. Therefore, it is out of this concern that the researcher became motivated to investigate the knowledge, attitudes, and perceptions of students regarding MMC at the University of Venda, South Africa.

1.3 Rationale and significance of the study

The rationale indicates the reason for undertaking the study and it is extremely crucial that the study's significance is justified at all times.

1.3.1 Rationale of the study

This study was conducted in a rural university, to assist in terms of rural MMC uptake. Several studies have focused on male respondents, mainly because circumcision is performed on males, overlooking the effects that female partners and mothers have on the decisions of their partners and sons to undergo circumcision (Auvert, Taljaard, Lagarde, Sobngwi-Tambekou, Sitta & Puren, 2005; Marais et al., 2019; Morris et al., 2017). This study included both male and female respondents, to gain insight into the views of both parties regarding medical male circumcision.

1.3.2 Significance of the study

The findings of this study provides evidence to help and inform policymakers to review and implement better the current policy on the provision of health education and promotion regarding MMC. The study assists educational institution, private clinics and the ministry of health to improve access to MMC services. Furthermore, this study provides insight into and knowledge to both males and females regarding the assonance and benefit of MMC, which recommend and motivate for a high number of circumcised males, given that the successful

implementation of male circumcision programs can save over seven thousand male adults and newly-born babies from HIV by 2025 (Chikutsa, 2011).

1.4 Study purpose and objectives

The study aim should be specific and easily identifiable when it has been reached (Burns and grooves, 2020)

1.4.1 Purpose of the study

The study aimed to investigate the knowledge, attitudes, and perception of the University of Venda students regarding Medical Male Circumcision.

1.4.2 Objectives of the study

Specifically, the study sought to:

- Assess the knowledge of the University of Venda students about Medical Male Circumcision
- Determine the attitudes of the University of Venda students towards Medical Male Circumcision
- Describe the perceptions of the University of Venda students regarding Medical Male Circumcision

1.5 Definitions of key terms

Male Circumcision

Male Circumcision is the removal of the foreskin from a male penis (Circumcision, 2012). In this study, MC refers to the removal of the foreskin by a traditional surgeon, or a medical practitioner.

Medical Male Circumcision

Medical Male Circumcision is the surgical removal of the foreskin from a male penis (Circumcision, 2012). In this study MMC refers to the surgical removal of three-quarters of the inner foreskin and total outer foreskin by a trained health care provider.

Knowledge

Knowledge refers to the fact of information and skills acquired through experience or education (Kharkar & Bowalekar, 2012). In this study knowledge regarding MMC includes types, benefits, and methods.

Attitudes

Attitude refers to the human degree of like or dislike and perceptions towards something, they might be positive and negative (Kharkar & Bowalekar, 2012). In this study attitude implied feelings of students, including their views and judgments towards MMC.

Perception

Kharkar and Bowalekar (2012) define perception as the ability to become aware of something through the human senses. In this study, perception refers to how MMC is understood or interpreted.

Student

Fenollar, Román and Cuestas (2007) define a student as a person who is studying at a university or any other institution of higher education. In this study, student refers to any person that is enrolled at the University of Venda during the time of the study.

1.6 Theoretical framework- Health Belief Model

This study was guided by the Health Belief Model (Rosenstock, Stretcher & Becker, 1988). This model was developed by a group of Public Health Service Psychologists from the United States of America, to provide a framework for understanding why some people take specific action to avoid or protect themselves from illnesses, while others fail to do so (Glanz, Rimmer & Viswanath, 2015).

The theory helps to articulate assumptions and hypotheses concerning the intervention strategies (Glanz, et al., 2015). This theory is relevant for this study because the study is concerned with students' knowledge, attitude, and perceptions about MMC which lead to a certain behavior of choosing whether to undergo MMC or not. The underlying concept of the original Health Belief Model (HBM) is that a health behaviour is determined by personal beliefs or perceptions about a disease, and strategies available to decrease its occurrence. Perceptions are modified by other variables such as knowledge, attitude, and motivation (Glanz, et al., 2015).

This framework as illustrated in Figure 1.1 indicates people's health-related behaviour, such as healthcare use and choice to undergo a specific surgical procedure. The constructs of the theory include perceived susceptibility, perceived benefits, perceived severity, and perceived barriers.

Perceived susceptibility

Motivation to initiate an action is reduced by a low perceived personal vulnerability (Kip, Ehlers & Van der Wal, 2009). Perceived susceptibility is a personal belief about the chances of acquiring an infection if preventative measures are not taken. In this study, if males and their female partners do not believe that MMC together with condom use, lower their chances of contracting HIV, it may increase their risk of contracting HIV.

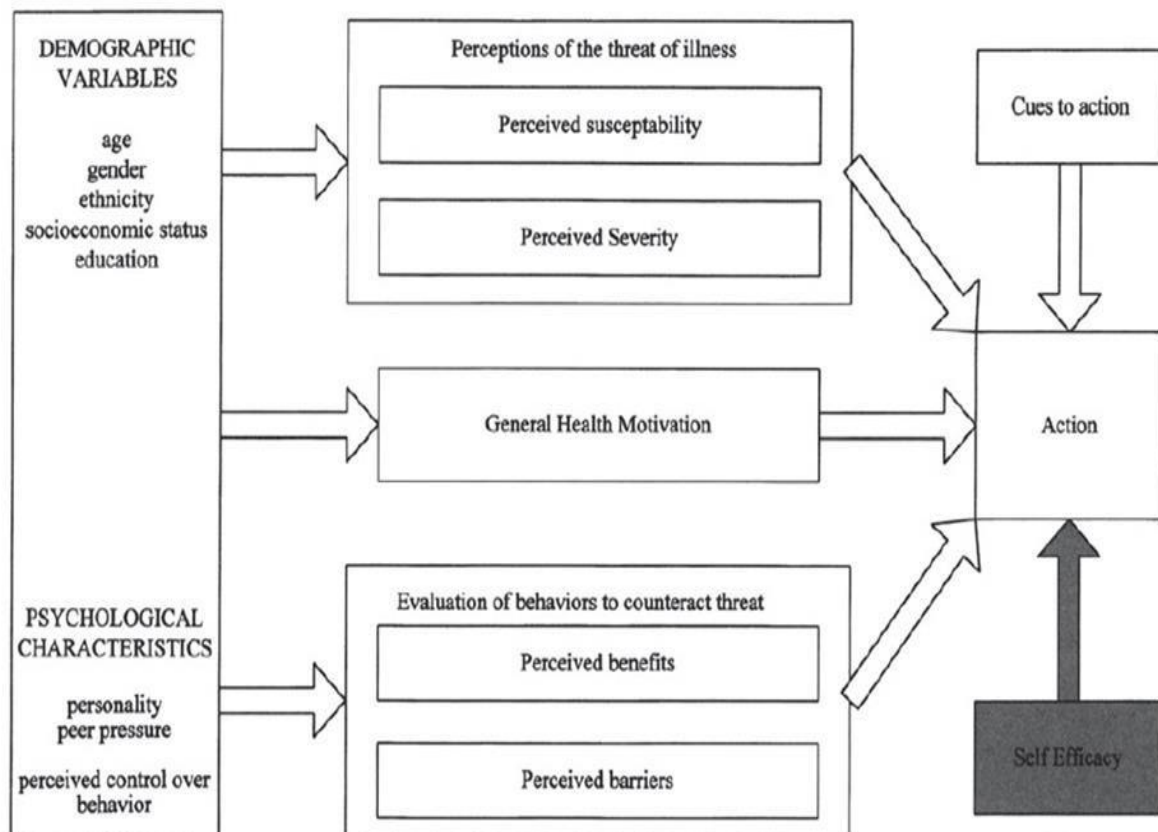


Figure 1.1 The health belief model [the model with self-efficacy represents the modified HBM suggested by Rosenstock et al., (1998)]

Perceived severity

Perceived severity refers to the individual's judgment of the consequences of contracting a disease. The HBM indicates that individuals may be motivated by the complications of sexually-transmitted diseases to undergo the MMC procedure (Glanz, et al., 2015).

Perceived benefits

Individuals who believe that the treatment offered to them will be effective are more likely to adhere to the treatment, but those who are suspicious or unsure are unlikely to be adherent. Perceived benefits regarding MMC may include the enhancement of sexual pleasure and improvement of the quality of life, by reducing the chances of acquiring HIV (Kip, et al., 2009). If male respondents are educated about the benefits of MMC and believe that these benefits can be applied in their lives, the respondents can be motivated to undergo the procedure.

Perceived barriers

The HBM can be useful to develop strategies for health promotion, which may lead clients who are unable to take positive action due to perceived barriers (Glanz, et al., 2015). For this study, perceived barriers may include fear of the unknown, for example, pain during surgery and the healing period of the wound, may lead the individuals to choose not to undergo or support the MMC procedure.

Perceived threat

The individual's health behaviour is determined by their perception of the vulnerability to the health threat and risks. Low perceived personal vulnerability may reduce the motivation to take an initiative to prevent illnesses (Glanz, et al., 2015). The HBM in this study states that if the individual does not feel like he is vulnerable to HIV infection, he might not take the initiative to undergo MMC or use other preventative measures. The more the individual's knowledge about MMC and HIV, the greater the likelihood of him protecting himself through undergoing MMC procedure or advising partners to undergo MMC and use a condom.

1.7. Outline of the chapters

Chapter 1: This section provided the background to the study, problem statement, purpose and objectives of the study. The chapter also gave a rationale, significance of the study, theoretical framework and defined key operational terms of the study.

Chapter 2: This chapter discusses the literature review aligned with the study. The literature reviewed focused on the origin of circumcision, overview of circumcision globally, in African and Sub-Saharan including South Africa. The review also explored knowledge, attitudes, and perception of young people regarding MMC.

Chapter 3: This chapter presents the research methodology and plan for data collection, as well as the methods with which the researcher used to achieve the objectives of the study. The chapter also covers the validity and reliability including ethical considerations.

Chapter 4: Presents the results including their interpretation.

Chapter 5: The chapter presents the discussion of the results also using relevant literature

Chapter 6: The chapter presents the conclusion, summary of the findings, discussion of limitations, and recommendations for practice and further research.

1.8. Conclusion

This chapter introduces the background of the study and outlines the research problem, purpose of the study and the objective of it thereof and the next chapter, chapter 2 is about the literature related of the study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

According to Singht and Thurman (2019), a literature review is a process that involves understanding what is known about a particular situation or phenomenon. Furthermore, it identifies the knowledge gap that exists so that the study can draw a conclusion on the topic being researched. In addition, the literature review provides an in-depth knowledge needed to study a selected problem enabling the researcher to build on the works of others. In this section of the study, literature relevant to knowledge, attitudes and perceptions regarding MMC will be discussed from a historical, global, regional and national perspective. The literature review in the current study guided the researcher to conceptualize the research problem adequately and understand the current body of knowledge related to the magnitude of HIV adverse effects and determinant factors for HIV/AIDS.

The researcher underwent a systematic and thorough identification and review of different literatures that were believed to be relevant to the research topic. Literature search was carried out using libraries and internet sources (from pubmed, medline and google). A number of studies were obtained and reviewed to gain knowledge on circumcision and HIV/AIDS. Sources that were used include scholarly articles in journals, e-books, books and book chapters. The search key words for sources included attitudes, circumcision, knowledge, medical, perceptions and youth. These key words helped the research to gather relevant information from different sources. However, due to a higher number of sources the present study was not too specific in terms of the period of sources due to the fact that the area of study has historical background, nevertheless the majority of the sources were five years old and all of them were published in the English language. For the selected sources the researcher will initially read the abstract to find if the source was relevant.

2.2 Origin of Circumcision as a practice

The term circumcision is derived from the Latin word "*circumcidere*", which means "to cut around". K'Odhiambo (2019) describes the term circumcision as the removal of the foreskin from the penile organ. He notes that there are four different types of circumcision and these include, complete removal of the foreskin (prepuce) leading to the exposing of the glans; snipping the frenulum but leaving the foreskin intact; cutting off part of the foreskin and leaving a remnant of one or two lateral flaps of loose skin; and, finally, "sub-incision". Male circumcision is one of the oldest surgical procedures known, traditionally undertaken as a mark of cultural identity or religious importance or for perceived health benefits such as improved

penile hygiene or reduced risk of infection. Siddhanta and Sinha (2016) observes that Muslims are the largest religious group to practice circumcision, and an estimated 68% of circumcised men are Muslim.

K'Odhiambo (2019) established that circumcision began over 12 000 years ago from the operation that was performed by a Mohel or physician in which a stone knife was used to circumcise and it was conducted in regions like Australia, New Guinea, North America, Middle East, and Africa. Circumcision began as a way of purifying individuals and society by reducing sexual pleasure and in Egypt, circumcision was conducted for cleanliness. Circumcision was revealed as a sacrifice of sinful human enjoyment for the sake of holiness in the afterlife. Furthermore, Zampieri, Piannezola and Zampieri (2008) among the Hebrews during ancient time's circumcision was performed to honour their forefathers. Vangen, Hoffmann, Flo, Lorentzen and Sand (2006) posit that the Bible (Old Testament) states that Hebrews believed that circumcision was a covenant between God and Abraham and his descendants because the penis is the source from which the perpetuation of the species emanates. Abraham circumcised himself over 3 800 years ago at the age of 99 years. After the circumcision, he became fit to father the Hebrew nation.

Circumcision is known in Arabic as al-Tohour and is practiced as a confirmation of the relationship with God; the practice is also known as 'tahera', meaning 'purification', but there is no specific mention of circumcision in the Koran (Chyi & San, 2016). The Prophet Muhammad was ordered to follow the faith of Abraham (Chyi & San, 2016), including the act of circumcision. In other writings, circumcision is ordered as one of five behaviours that men should follow to attain a high degree of respectability and dignity. Circumcision is also almost universally practiced among Jewish people. The religious justification for Jews comes from Genesis 17, which states that circumcision is a covenant with God and that all boys should be circumcised on the eighth day of life (Zampieri, Piannezola & Zampieri, 2008). Most other religions, including Christianity, Hinduism, and Buddhism, tend to have a neutral stance towards circumcision.

2.3 Global view in MMC

The religious and cultural considerations are a major reason behind circumcision as a practice and a growing volume of research attests to the significant medical and public health benefits of MC. According to Chimuti (2013), circumcision has been widely practiced for non-religious reasons for many centuries in West Africa and in parts of central, east and Southern Africa, as well as among aboriginal Australasians and the Aztecs and Mayas in the Americas in the Philippines and Eastern Indonesia and on various Pacific islands, including Fiji and the

Polynesian islands. More recently, circumcision has become common in other settings, including the United States of America and the Republic of Korea. In some cultures, circumcision is an integral part of a rite of passage to manhood and is associated with factors such as masculinity, self-identity, and spirituality (WHO, 2019). For example, circumcision in Turkey is seen as part of becoming a man and a member of society, and it can be seen as unacceptable to remain uncircumcised. In other settings, circumcision is most commonly carried out on neonates or in childhood, with the primary reason being perceived improved penile hygiene, or to fit with the social norm (WHO, 2015).

Faleye (2014) attests that health, medical, sexual, and cosmetic benefits may explain why MC is a fundamentally inherent part of diverse human cultures globally, especially in hot arid environments. In light of the protection that MC affords against HIV infection in particular major health bodies such as the World Health Organization (WHO), the Joint United Nations Program on HIV/AIDS (UNAIDS), and the Centers for Disease Control and Prevention (CDC) have endorsed and currently promote voluntary medical MC (VMMC) in HIV-1 epidemic settings in which the major route of HIV transmission is through heterosexual intercourse (Morris, Wamai, Henebeng, Tobian, Klausner, Banerjee & Hankins, 2016).

Morris et al., (2016) further states that benefits exceed risks many folds, with half of the uncircumcised males developing at some point at least one of the conditions against which MC offers either partial or complete lifelong protection. However, the US has, arguably, the highest quality medical technology and expertise available in the world to those who can afford it. It has been years of good progress since VMMC was recommended in 2007 by UNAIDS and WHO as a key HIV prevention intervention in high prevalence settings particularly in the developing countries (Lane, Bailey, Luo & Parks, 2018).

The pace of scale-up has varied across priority countries. An increase in the annual numbers of VMMCs performed was observed from 2008 through 2018. Although there has been progress in targets that accumulated over the years, especially in 2015 and especially in the countries that are lagging. Global reporting on VMMC progress is improving including age disaggregation and national VMMC program monitoring and reporting is improving over time including on age disaggregated data which is crucial for programming (Lane et al., 2018). In the 2018 reporting period, 84% of the priority countries reported on age disaggregated VMMC data with about 84% of VMMCs conducted in 12 of the 15 countries (Africa) in 2018 were among adolescent boys and young men aged 10-24 years, which is within a priority age group (10-29 years) for this intervention. Globally disparities exist across countries in which a large proportion of VMMCs is among boys aged 10-14-years) and the epidemiological impact from these young adolescents will be reaped in subsequent years as they age into the older

sexually active high-risk age groups UNAIDS consultation on male circumcision for HIV prevention held in 2007 to review this evidence (WHO, 2018).

2.4 Circumcision in Africa and Sub-Saharan Africa

It is estimated that one HIV infection was averted for every 80 circumcisions performed during the 2008–2017 scale-up phase and continuing impact through 2030 will mean one HIV infection averted for every 12.5 of these circumcisions. Benefits will continue to grow beyond 2030 (Hines, Ntsuape, Malaba, Zegeye, Serrem, Odoyo-June, Nyirenda, Msungama, Nkanaunena, Come & Canda, 2017). For example, the HIV incidence in a demographic surveillance cohort in Siaya County, Western Kenya, dropped from 11.1 per 1000 person-years in the period 2011–2012 to 5.7 per 1000 person-years in the period 2012–2016 as both VMMC and ART were scaled up (Borgdorff, Kwaro, Obor, Otieno, Kamire, Odongo, Owuor, Muthusi, Mills, Joseph & Schmitz, 2018). Between 2008 and 2016, there were approximately 14.5 million VMMC procedures performed, which represented 70% of the original UNAIDS targets (Hines et al., 2017). Subsequent targets are for an additional 27 million procedures to be conducted by 2021 (Gisslen, Svedhem, Lindborg, Flamholz, Norrgren, Wendahl, Axelsson & Sönnnerborg, 2017). To meet these ambitious targets, the focus is needed related to the facilitators and barriers influencing MMC uptake and among the many factors influencing VMMC uptake, perceptions of decreased sexual functioning and satisfaction following VMMC are likely to attribute the drop primarily to a direct protective impact of VMMC.

Ledikwe, Mawandia, Kleinman, Ntsuape, Kamabu, Semo and Wirth (2020) assert that since VMMC programs began, evidence has shown that HIV incidence in the community has decreased in South Africa and Uganda. Furthermore, in 2013 a total of 2.7 million male circumcisions were performed in the 14 priority countries, for a cumulative total of 5.8 million by the end of that year. Provisional data show a cumulative total of 8.9 million male circumcisions through 2014. Ledikwe et al. (2020) established that in a randomized trial in Kenya, Uganda, and South Africa that VMMC reduces the risk of acquiring HIV by 51–60% among heterosexual men. In response, the WHO and the UNAIDS (WHO, 2018) recommended substantive efforts to scale-up VMMC services as an add-on strategy for HIV prevention in high HIV burden countries (Ledikwe et al., 2020).

The ground observations in priority sub-Saharan African countries suggest that the success of VMMC programs should not be based solely on numbers of males circumcised (Cork, Wilson, Perkins, Collison, Deshpande, Eaton, Earl, Haeuser, Justman, Kinyoki & Mayala, 2020). It was further estimated that in Africa that one HIV infection was averted for every 80 circumcisions performed during the 2008–2017 scale-up phase and continuing impact through 2030 will

mean one HIV infection averted for every 12.5 of these circumcisions (WHO, 2019). VMMC programs are cost-saving in almost all priority VMMC countries when HIV treatment costs averted are considered. The global target of 20.8 million VMMCs by 2016 was nearly attained in 2017 (90% of target). Of the 14 countries, seven reached country-specific targets that include Ethiopia (Gambella Region), Kenya, Mozambique, South Africa, and Uganda (Cork et al., 2020). However, reaching HIV negative adult men and those males at higher risk of HIV and STI with combination prevention and testing remains a challenge. Countries, with technical and donor support, are identifying approaches to enhance uptake among these groups.

Cork et al. (2020) revealed that the cost per HIV infection averted, which ranges from US\$369 in Zimbabwe to US\$4,096 in Rwanda, is below US\$1,000 in all countries except Malawi, Namibia, Rwanda, and Uganda. These costs per infection averted are comparable to those of prevention of vertical transmission (US\$663 per HIV-positive birth averted), voluntary counseling and testing (US\$1,315 per HIV infection averted), and prevention of STIs (US\$321–US\$1,665). Nonetheless, all of the values tested for these parameters resulted in lives saved and cost savings for all countries however it is especially important to note that even if VMMC coverage is scaled up to 50% in 5 years instead of to 80%, high numbers of infections will be averted and net savings per infection averted will be obtained in all countries except Mozambique and Tanzania, the two countries where pre-scale-up coverage is higher than 50%. This is critical because even though there is no evidence available yet on the feasibility of scaling up VMMC coverage to 80%, there is evidence that VMMC coverage rates of above 50% can be reached through VMMC scale-up efforts (Lissouba, Taljaard, Rech, Dermaux-Msimang, Legeai, Lewis, Singh, Puren & Auvert, 2011).

2.5 Circumcision and HIV in South Africa

In a South African context Dévieux, Saxena, Rosenberg, Klausner, Jean-Gilles, Madhivanan, Gaston, Rubens, Theodore, Deschamps and Koenig (2015) posit that circumcision is performed for cultural reasons during adolescence outside formal health care settings without anaesthesia in challenging traditional settings. According to Grabowski et al. (2017), cultural circumcision is typically practiced as a rite of passage as the adolescent moves from childhood to manhood. Male circumcision was carried out in the Zulu culture in the province of KwaZulu Natal but was suspended more than 200 years ago by the Zulu King, Shaka because septic wounds from the circumcision procedure had left many men unable to participate in the war. Furthermore, cultural circumcision in Southern Africa is important in the context of current efforts to scale up MMC services for HIV prevention as it provides partial protection for men against acquiring HIV infection through heterosexual sex, with 60% effectiveness.

While a staggered rollout of voluntary medical adult male circumcision for HIV prevention has been initiated, traditional male circumcision and non-circumcision are important signifiers of cultural identity and masculinity in South Africa (Howard-Payne, 2016). Research has indicated that by circumcising 80% of all uncircumcised adult men in the countries with high HIV prevalence and low prevalence of male circumcision by 2015 would avert one in five new HIV infections by 2025 (WHO, 2019). Thus, in order to meet the target of medically circumcising 20 million men by 2015, South Africa (along with 15 other African countries) up scaled the implementation of HIV prophylactic VMMC since 2007. However, the uptake of VMMC has varied significantly between provinces and countries, for example, by the end of 2012, South Africa had only reached 20% of its target for the number of men set to undergo VMMC while Kenya had reached 63% of its 2015 target (WHO, 2019).

One of the reasons for this difference in VMMC uptake may be related to the tension that exists in South Africa between tradition and medicine as well as the meanings assigned to these different practices as they relate to male circumcision. In urbanized Johannesburg, where men seem to concurrently perpetuate and discard characteristics and performances of hegemonic masculinity, there is a space for tension between tradition and medical modernity (Ledikwe et al., 2020). This is then considered against the backdrop of TMC practices as performed within traditional male initiation among Xhosa, Ndebele, Tsonga, Venda, Tswana, and Northern Sotho men in South Africa (Mothiba & Bopape, 2019).

2.6 Knowledge of MMC

Historically male circumcision is already a cultural practice amongst sectors of the mainly rural population of South Africa, including in the Xhosa-, Venda- and Sotho-speaking ethnic groups. However, literature shows that circumcision is not part of every cultural traditional practices. Although the practice of male circumcision was supported by many tribal kings king in 2010, the practice was still considered somewhat alien amongst the isiZulu speaking population, and as a consequence, Zulu men may be potentially reluctant to undergo MMC as it is not part of their culture. Willingness to undergo MMC may also be influenced by knowledge of the procedure and its potential benefits and challenges. A qualitative study in rural KwaZulu-Natal in 2018 reported that men generally did have adequate knowledge of the potential benefits of MMC and expressed willingness to undergo the procedure (Nxumalo & Mchunu, 2020).

Interestingly, the study reported that men's positive attitude could be enhanced by women's endorsement and increased participation in MMC promotion. It is encouraging that women could play a potentially positive role in supporting the MMC campaign. However, as circumcision is culturally unfamiliar, Zulu women may have an ambivalent or somewhat negative attitude

towards supporting men in carrying out MMC. There may also be some ambiguity or negativity around MMC for other reasons, including that it may be associated with a negative effect on sexual pleasure. Rural women's knowledge around potential benefits and challenges of MMC may be lacking, as they may have poor access to health information in general and about MMC in particular (Mothiba & Bopape, 2019). A large multi-center international study found that although women generally support MMC programs, they often lack factual knowledge about the benefits and risks of MMC and its role in HIV infection prevention.

Lissouba et al. (2017) established that women are directly involved in MMC for several reasons which include that male circumcision may influence sexual encounters of both men and women. In this context, investigating knowledge, preferences, and perceptions regarding medical MC is important and should be studied in the context of the current VMMC roll-out in Southern and Eastern Africa. Acceptability studies carried out before the implementation of roll-out in Kenya, South Africa, and Botswana, have shown that 47–79% of women were in favor of circumcision for their sexual partners and 62–89% of women were willing to circumcise their sons (WHO, 2019). Another Kenyan study conducted immediately before the VMMC program scale-up commenced reported a preference among women for circumcised partners (Hines et al., 2017). However, limited community-based studies address trends of women's opinions concerning MC over time in the context of VMMC roll-out.

A study of information availability and utilization by rural women in Southern Africa reported a need for suitable media where information on issues such as health, agriculture, education, business, and legal matters could be made more readily available (Faleye, 2014). In addition, the study by Mangombe and Kalule-Sabiti (2019) found that education influences perception of risk of HIV infection, for instance, youth with secondary education were less likely to perceive themselves to be at a higher risk of HIV infection compared to respondents with higher education. However, youth with primary education were less likely to perceive themselves to be at low risk of HIV infection compared to those with both secondary and higher education. As education increases, the young men are more likely to perceive themselves to be at high risk of HIV infection, most likely because they understand the dynamics of HIV infection. Therefore, the decision to be circumcised is determined by the level of education which informs individual that they are at risk. As education increases, the young men are more likely to perceive themselves to be at high risk of HIV infection, most likely because they understand the dynamics of HIV infection. However, these results are inconsistent with previous studies; for instance, a study among military personnel in Nigeria found an inverse relationship between educational attainment and HIV risk perception, thus the choice for MMC (Gilbertson et al., 2019).

In support of that, a study by Khumalo (2016) established that Educational intervention is key and it warranted to increase the level of knowledge with the support of institutional organizations and governing medical bodies as well as policymakers in facilitating MMC. Past research indicates that in order to systemically promote the translation of knowledge, all decision-makers including patients, institutional administrators, and policymakers must have access to current evidence-based research. However, WHO (2019) suggests that the educational intervention in MMC should be specific and to increase circumcision knowledge and promote informed decision-making, a multi-prong approach is necessary. This approach may include the following: the creation of a module about MMC for through a continuing I education course and/or implemented within training curriculum, distributing information about male circumcision to health educators and discussing this at staff meetings and creating fact sheets and pamphlets for parent(s)/guardian(s) to increase their level of knowledge and facilitate discussion.

2.7 Attitudes towards MMC

According to Mshana, Wambura, Mwanga, Mosha and Chungalucha (2011), social pressure for traditional circumcision is likely to be experienced by adolescents in the traditionally circumcising communities. The majority of Xhosa initiates (70%) felt that they could be stigmatized as a result of opting for medical rather than traditional circumcision (Peltzer & Kanta, 2009). Among the Xhosa, ridiculing and stigmatization of uncircumcised males or those circumcised in the hospital are common, and such pressure results to some young males presenting themselves to initiation school without the knowledge or consent of parents (Magodyo, Andipatin & Jackson, 2017). Peer pressure for MC is also documented among traditionally non-circumcising communities such as the Sukuma of Tanzania (K'Okhiambo, 2019), wherein the majority of Sukuma youths attending boarding secondary schools reported having to circumcise to avoid stigmatization from their peers.

Therefore, in communities with a strong preference for traditional MC, risk reduction interventions to avoid infection and death may be the appropriate strategy to pursue. Reports of the same knife being used on several initiates are worrying. Risk reduction strategies have been effective in curbing the HIV epidemic among intravenous drug users (WHO, 2019). Hence, the provision of safe circumcision kits for each initiate or training and offering disinfectant to traditional circumcisers may be a way to make traditional circumcision safe while the gradual uptake of health facility MC is promoted. The involvement of traditional leaders and circumcisers in such an intervention is crucial so that they provide traditional legitimacy. Mshana et al. (2011) established that the existing positive attitudes towards MC in

traditionally circumcising communities mean that such programs would start on a solid foundation.

On the contrary, a study in Tarime, Uganda, females reported sexual enjoyment with circumcised males than those not circumcised. Grabowski et al., (2017) observe that in Kenya, MC did not negatively affect the sexual satisfaction of males after participants were asked to compare their experiences of sexual pleasure before and after circumcision. In the Ugandan study, the majority of female participants reported either no change or improved sexual satisfaction after their partner's circumcision (Grabowski et al., 2017). However, it is important to point out that sexual satisfaction is subjective and may be determined by relationship issues between partners therefore the provision of outreach health services to manage complications during the traditional circumcision ceremonies could also be considered. Sub-Saharan Africa countries could, for example, specify the need to arrange traditional MC ceremonies in collaboration between community leaders and district health authorities (Corcks et al., 2020). They could also offer training on how to provide first aid to MC initiates who suffer from immediate adverse effects such as excessive bleeding and the need to immediately refer such cases to nearby health facilities in the area and such holistic and context-sensitive programs are more likely to achieve the desired attitude.

2.8 Perception regarding MMC

Sengwayo (2011) posited that there have been numerous studies of MMC acceptability in both traditionally circumcising and non-circumcising communities in Africa and these studies show high levels of acceptability, despite fears expressed by men of pain, excessive bleeding, and death). However, some studies have also noted a false sense of security among some newly circumcised men and belief that MMC provides an HIV prevention panacea reducing the need for condom use. Furthermore, Lissouba et al. (2017) outlined factors that deter men from undergoing MMC include fear of pain, perception of low HIV risk, lack of partner, parent or social support and a preference for traditional, 'rites of passage' circumcision, which carries a cultural significance in some communities. In addition, Tobian, Serwadda, Quinn, Kigozi, Gravitt, Laeyendecker, Charvat, Ssempijja, Riedesel Oliver & Nowak (2009) emphasized that men's perceptions of MMC have been associated with beliefs about improved personal health, hygiene, and sexual performance. In South Africa, Lissouba et al. (2017) found health-related beliefs to be strong motivators for men to take up circumcision beliefs such as that the uncircumcised penis collects dirt which promotes disease and is generally unhealthy.

While still, other studies have observed that in traditional circumcising communities, men are often not respected if they have been medically circumcised and not gone through the

appropriate traditional circumcision rituals and would thus not be considered to have completed the transition from boyhood to manhood. All of these factors have the potential to influence men's willingness to participate in a large scale MMC roll-out program. Waters, Mugisa, Bowa, Linyama, Stringer and Stringer (2013) established that ethnicity has also been highlighted as a potentially important consideration and studies in South Africa have examined men's attitudes to MMC through the lens of ethnicity as part of the feasibility assessment of a national roll-out program. According to Sengwayo (2011), among adults from non-circumcising communities participating in their studies, more than 70% said they would like to be medically circumcised if it reduced the chance of getting HIV and STIs. Both of these studies concluded MC acceptability as highest among Xhosa men (72%), a group with a tradition of male circumcision, but also popular among Tswana men (52%), who have no such tradition and generally much lower circumcision prevalence. Although traditional male circumcision practices vary, these studies conclude ethnicity per se, does not seem to be a determinant of acceptability and as a result should not impede the roll-out of MMC nationally.

It is believed that fathers who do not believe in male circumcision and are not circumcised would not get their children circumcised, thus exposing young boys at greater risk of contracting HIV and AIDS (Khumalo, 2017). In African traditional societies such as Xhosa, Ndebele, Pedi, South Sotho, and Venda, circumcision is a common practice associated with rites of passage that serve the needs of society and individuals. Xhosas are circumcised during manhood initiation rituals, the ritual consisting of various stages such as pre-ritual preparation, circumcision, and seclusion in the lodge and re-integration into society. Male circumcision is perceived as the gateway to manhood. However, major problems can occur as a result of the incorrect performance of circumcision, such as using one blade more than once, which puts the initiates at risk of contracting HIV. In 2011 the Eastern Cape legislature made recommendations that each boy should be examined by a doctor and boys at schools who had been circumcised should be inspected to ensure that the boys were safe (Sengwayo, 2011). Prior to a VMMC campaign, data collected from men and women residing in a traditionally non-circumcising community in Kenya indicated that 25–35% of the participants thought VMMC would reduce penile sensitivity and 14% believed circumcision would decrease sexual pleasure for the man (Riess, Achieng & Bailey, 2012).

In contrast, in the same study, 38% of women thought their sexual enjoyment would improve with circumcision; a finding that has been reported by other studies (Riess, Achieng & Bailey, 2014). In addition to beliefs about circumcision's impact on sexual functioning and satisfaction, inaccurate perceptions about the procedure's protection against HIV infection may lead to sexual risk compensation. Risk compensation, also known as behaviour disinhibition, can be described as an increase in risky sexual behaviour due to a perceived reduction in HIV risk.

For example, circumcised men may feel completely protected from HIV infection, therefore decreasing condom use and increasing casual and multiple concurrent partners. Such behaviour, if practiced by enough men within a community, could attenuate the public health benefits of VMMC. In order for the rates of MC or MMC to increase, society and the individual's perceptions must be better understood. The promotion of successful health strategies, for example, MC and MMC, must influence people's perceptions

2.9. Conclusion

The literature review focused on the historical background of circumcision from a cultural perspective. Furthermore, the literature was also discussed from a global, regional, national and local perspective of MMC with regards to the knowledge, attitudes and perception of young people as well as myth and challenges facing this health intervention.

CHAPTER 3

METHODOLOGY

3.1. Introduction

This section provides an overview of the methodology used in the study. The discussion focused on the research design, population sampling, data collection, data analysis, and ethical considerations. Burns and Grove (2020) describe the methodology as including the design, setting, sample, methodological limitations, and the data collection and analysis techniques in a study.

3.2 Study Design

This study adopted a quantitative approach, using a cross-sectional survey design. The cross-sectional survey design was used because the researcher collected data at one point in time. For this study, the cross-sectional survey design described the level of knowledge, attitudes, and perceptions of university students regarding MMC as it is at the time of investigation. The Integral to quantitative-cross sectional is the expectation that a researcher sets aside his or her experiences, perceptions, and biases to ensure objectivity in conducting the study and the conclusions that are drawn.

3.3. Study Setting

The study was conducted at the University of Venda. The University is situated in Thohoyandou, a small town in Vhembe district, Limpopo Province. Venda is an area rich in different types of fruits throughout the year, which makes it a desirable area for tourists and business people. It is an area where agriculture is still practiced domestically. However, students from all over South Africa and across the South African borders are drawn to the University of Venda because of the quality of education offered by the institution, as opposed to its agricultural practices. Most people in the local area are Venda-speaking people and have been practicing traditional circumcision for many years. The rate of MMC at the University of Venda campus is unknown because the university clinic does not offer the services. However, due to the diversity of students on the campus, there might be students who require MMC services. The university has nine on-campus residence, can house about 1779 students, amongst which there are about 921 males and 858 females. There is also a clinic which operates from 8h00 to 16h00. The clinic does not offer MMC but only HIV Testing Services and primary health care.

3.4 The study population and sampling

The study population is the subgroup of the targeted population whereby the sample is selected.

3.4.1 Population

Study population is defined as the entire aggregate of cases in which a researcher is interested. It is therefore, useful to make a distinction between the accessible and target population (Burns & Groove, 2020). The target population of this study was all university students (both males and females) residing in the University of Venda campus as of January 2021, wherein the sample was drawn systematically from residential halls. The study focused on students residing on campus because of their cultural diversity, which might assist the researcher to get input from students who are from different areas.

Table 3.1: Population Distribution according to residences

Residence Halls	No. Of Students	
	Male	Female
Riverside	124	124
F5	12	--
F4	0	372
F3	372	--
Bernard Ncube (F block)	0	58
Mango Groove (F2)	0	124
Carousel (F1)	123	--
Lost city girls (DBSA1&2)	0	180
Lost city boys (DBSA3&4)	178	-
Total	921	858

Source: Residence warden records as of 2021 January.

3.4.2 Sampling

3.4.2.1. Sample size

A sample size is the number of entities in a subset of a population of a study and is an important feature of a study in which the goal is to make inferences about a population. Studies have indicated that the bigger the sample, the more the significance of the results.

Slovin's formula was used to determine the sample size (Pagano & Gauvreau, 2018).

n = sample size of the adjusted population.

N = population size

e = accepted level of error set at 0.05.

$$n = \frac{N}{1 + N(e)^2}$$
$$n = \frac{1779}{1 + (1779 \times (0.05)^2)}$$
$$= 1779 / (1 + 4.4475)$$
$$= 1779 / 5.4475$$
$$= 327$$

3.4.2.2. Sampling of rooms

Stratified random sampling technique was employed, each residence was regarded as a single stratum. Systematic random sampling was used to select rooms from which respondents were chosen. The sampling method was used to select students' room numbers. The total number of the rooms was divided by the sample size to find the K value, which is the interval value; K value = $N/n = 1779/327 = 5$. Therefore, every 5th room was selected for the study. The room numbers on each residence were written on a sheet of paper and put in a bowl, shaken and the first room to start were selected randomly

3.4.2.3 Selection of respondents

Individuals occupying the selected rooms were part of the study. Individuals staying on campus were included as they represent different cultures and tribes from across the country and beyond. Individuals residing off-campus were excluded as majority of them represent a small local cultural group.

Inclusion criteria

- All students registered
- Student staying on campus
- All females and males
- Undergraduate and post graduate students

Exclusion criteria

- Student staying off campus

Table 3.2: Composition of the Sample

Residence Halls	No. of Participants			
	Male		Female	
Riverside	124	124/1779x327=23	124	124/1779x327=23
F5	124	124/1779x327=23	--	
F4	0		372	124/1779x327=68
F3	372	124/1779x327=68	--	
Bernard Ncube (F block)	0		58	124/1779x327=11
Mango Groove (F2)	0		124	124/1779x327=23
Carousel (F1)	123	124/1779x327=22	--	
Lost city girls (DBSA1&2)	0		180	124/1779x327=33
Lost city boys (DBSA3&4)	178	124/1779x327=33	-	
Total	921	169	858	158

3.5 Data collection tool

Data collection is a systematic way of gathering information relevant to the research purpose or question (Munro, 2005). For this study, a self-administered questionnaire was provided in English without translation. This is because the respondents are believed to have a good command of the English language since it is the medium of instruction. The questionnaire comprised of four sections; namely, demography, knowledge, attitudes, and perceptions regarding MMC. The knowledge of MMC was measured by analyzing the percentage of respondents' responses to each question on the knowledge section and the questions were assigned Yes/No as the possible answer. The questions on attitudes and perceptions were designed on a five-point Likert scale (strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5)). Munro (2005) posits that a Likert scale often used in psychometric questionnaires, which requires the subject to respond with how much they agree or disagree with a statement and for this study this rating method aimed at measuring how intense a person's feeling (attitudes and perceptions) are in relation to each statement. The MMC perceptions were measured through the respondent's percentage in response to the question. The research data collection instrument was developed and used after a thorough review of

pre-existing instruments that were used to identify knowledge, attitudes, and perceptions of people towards any medical intervention of any sort. The tool consisted mainly of closed-ended questions. It was developed by the researcher and reviewed by both the supervisor and the experts in MMC.

3.6. Pre-testing of the instrument

A pre-test is a preliminary test of the study instrument administered to a statistically smaller sample of respondents before a full-scale study (Cresswell & Cresswell, 2017). The researcher conducted a pre-test among 60 (18% of the sample of the main study) off campus students who are not part of the study however they share similar characteristics. The sample was made up of 28 males and 32 females students in which the age ranged from 17-30 years older, however the majority were between 22-30 years old. The pre-test helped the researcher to be familiar with the data collection instrument and the data collection process. The researcher went to the residence in off campus and negotiated with the security guard who offered him permission to meet with the block representatives in each residence. The researcher left the questionnaires together with the consent forms and collected them the following day. The researcher noted that due to Covid-19 the respondents were difficult to identify and their feedback was slow, as some questionnaire were only ready for collection after 3 days however the data collection was successful. In conclusion, the researcher learnt that enough time is needed to allow the respondents complete the questionnaire and it also gave the researcher time to capture the ones completed.

3.7. Data collection plan

Data collection is an important aspect of research. Inaccurate data collection will ultimately lead to invalid study findings. To ensure a high response rate, respondents were given enough time to complete the questionnaire. Due to the Covid-19 pandemic which has ravaged many communities, the researcher collected data in line and respecting the Covid-19 regulations. The researcher distributed the enveloped questionnaires to every residence selected and the questionnaires, consent forms and information sheets were dropped at the reception/guard room. This was done to avoid physical interaction with the students, the respondents picked the questionnaires at the reception and given three days to complete the questionnaires and return them at the reception. A hand sanitizer was provided at each guard room for disinfection before and after touching the provided documents. With the help of security guards in different residences the researcher monitored the return of completed questionnaires.

3.8. Data analysis

Data was analysed using the Statistical Package for Social Sciences (SPSS) version 25.0. Descriptive statistics were used to summarize data. Cross-tabulation and chi-square analysis was carried out to determine the association between the university students' attitudes towards MMC and socio-demographic factors with the significance level set at 0.05.

The data was presented in the form of frequency tables, pie charts and bar graphs, to summarize the findings. In the section on MMC attitudes

3.9. Validity and reliability

These two aspects are key aspects of research which differentiate between a poor and a good research.

3.9.1 Validity of the study

Validity refers to the accuracy of the research and the accuracy of each step independently. The content validity was ensured through extensive reviewing of literature which was related to the subject under discussion. The face validity was ensured by the supervisor, and the experts in MMC were consulted to review the questionnaire in which some comments were raised in terms of language and terminology. The effected changes on the questionnaire following advice from the MMC specialists from Aurum Institute, Dr Dino Rech and Dr Josephine Otchere-Darko included, changing the language of questions to avoid using excessive medical jargon as the intention was not to measure advanced knowledge as we would in an MMC training. The specialist further advised that MMC should be noted in full to avoid confusion with traditional circumcision since the questionnaire is self-administered which might limit the chances of explanations. However, all the comments were attended to and effected by the researcher and it was therefore accepted as suitable for data collection.

3.9.2 Reliability

Reliability is the extent to which results are consistent over time, and an accurate representation of the total population under study is referred to as reliability. If the results of a study can be reproduced under a similar methodology, then the research instrument is reliable (Munro, 2005). To ensure the reliability of the questionnaire, the SPSS Cronbach's Alpha method was employed wherein items on the Likert scale variables were selected and analysed for internal consistency of the tool. Cronbach's alpha is a measure of internal consistency ($0 \leq \alpha \leq 1.0$) of the instrument and the analysis yielded a fairly higher value of 0.786 which suggests that the items have relatively high internal consistency.

3.10. Ethical considerations

All researchers are required to report on the ethical considerations to give the readers assurance of review board approval and participant consent.

3.10.1 Institutional approval and permission

The research proposal was presented to the Department of Public Health, the Executive Higher Degrees Committee of the School of Health Sciences for quality assessment and to the University Higher Degrees Committee at the University of Venda, for approval. The University Research Ethics Committee provided an ethical clearance number **SHS/20/PH/26/0610**. The ethical clearance was then presented to the University of Venda Director of Student Affairs in request for permission to access the students (Appendix F).

3.10.2 Informed consent and voluntary participation

Information letters (Appendix B) were given to each respondent and each respondent was required to sign a consent form (Appendix C). The researcher adhered to all the national Covid-19 regulations which promotes social distance and avoiding social public interactions, therefore the students collected enveloped questionnaire, consent forms and information sheet from the reception at each residence. The researcher ensured that all the essential information, such as the purpose of the study and significance of the study, as well as voluntary participation, was provided on the information letter, to enable the respondents to make an informed decision. Respondents were told (information letter) that they have the full right to refuse to participating in the research (they can choose not to respond to some or all questions) and respondents that do not wish to further participate in the study can withdraw at any time.

3.10.3. Confidentiality and anonymity

The respondents were informed that the information collected for this research project would be treated as confidential as completed questionnaires were kept under lock and the information provided by the respondents was not made available or divulged to any person and the participants were allocated a numerical number and their names were used. The researcher explained that the information provided by the respondents on the questionnaires would be impossible to link it with participants both by the facilitator and the researcher because it has no name or other identification on it. The process of filling the questionnaire was conducted in an environment conducive to the participants.

3.11 Dissemination plan for study findings

The report of the study in the form of a dissertation will be submitted to the Library of the University of Venda, the student management at the University of Venda and to the MEC of

Health, Limpopo, South Africa. It is also envisaged that the findings will be published in a relevant journal so that it will be accessible to many audiences.

3.12. Conclusion

This chapter covered the research design, methodology, population, sample, data collection, research instrument, data analysis, ethical principles and plan for dissemination of results.

CHAPTER 4

RESULTS AND INTERPRETATION

4.1 Introduction

The study aimed to investigate the knowledge, attitudes, and perception of the University of Venda students regarding MMC. This section, presents the findings and interpretation of the data collected. The presentation of the study findings is done following the structure of the questionnaire/instrument used to collect data which is divided into four sections is section **A**, **B**, **C**, and **D**. The results are statistically presented in the form of frequencies and percentages with the chi-square test and cross-tabulation used in presenting the association between socio-demographic information and respondents' knowledge, attitudes, and perceptions regarding MMC.

4.2 Section A: Demographic Characteristics of the study participants

Table 4.1: Demographic information (n=315)

Variables	Frequency (n)	Percentage (%)
Gender		
Male	202	64.1
Female	113	35.9
Total	315	100
Age		
18 years	57	18.1
19-21 years	124	39.4
22-24 years	51	16.2
25-26 years	20	6.3
27-30 years	37	11.7
30 years and above	26	8.3
Total	315	100
Academic Level		
1st Year	31	9.8
2nd Year	32	10.2
3rd Year	49	15.6
Postgraduate	203	64.4
Total	315	100

Initially, the study aimed at collecting data from 327 students however the study revealed that only 315 responded, giving a 96% response rate. Table 4.1 above shows the gender, age, and academic level of the study respondents. The majority 64.1% of them were males and the female constituted 35.9%. The study respondents comprised of many 19-21 years old (n=124;39.4%) and a few were distributed between the age of 22-30 years of age. However, 18.1% of the ones who were 18 years of age cannot be ignored as well as the 8.3% who were over 30 years. The respondents had a majority of post-graduate students followed by 3rd years, 2nd years and 1st years respectively.

4.2.1. Residential distribution

Figure 4.1 below illustrates the distribution of the participants according to their residence. The figure shows that the 30.5% were from Riverside, 22.5% from F3, of 12.7% from Carousel, 7.9% from Bernard Ncube, 6.3% from Mango Grove and 7% from Lost City Girls. A few participants came from F5, F4, and Lost City Boys.

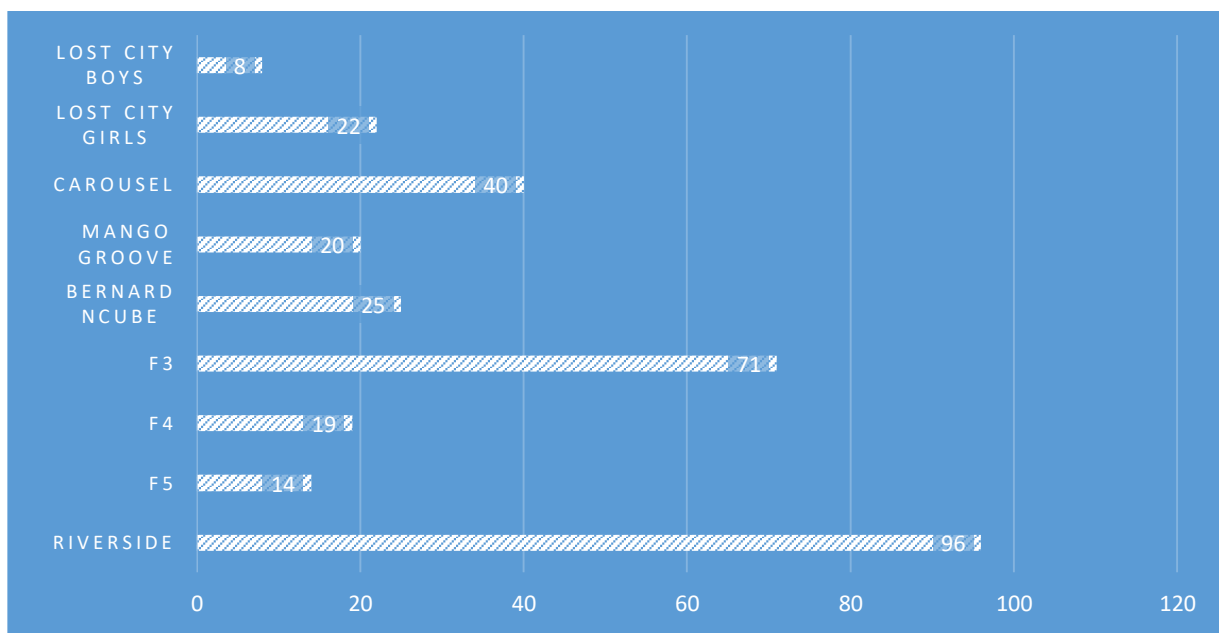


Figure 4.1: Residential distribution of respondents

4.2.2 Cultural affiliation and Country of origin of respondents

Many of the respondents who participated in the study were 78% South Africans followed by Zimbabweans and a few from Botswana and Nigeria respectively. As highlighted in Figure 4.1.2 below the majority of respondents were the Venda, Tsonga and Ndebele and few numbers constituted the Swati, Shona, Igbo and Pedi.

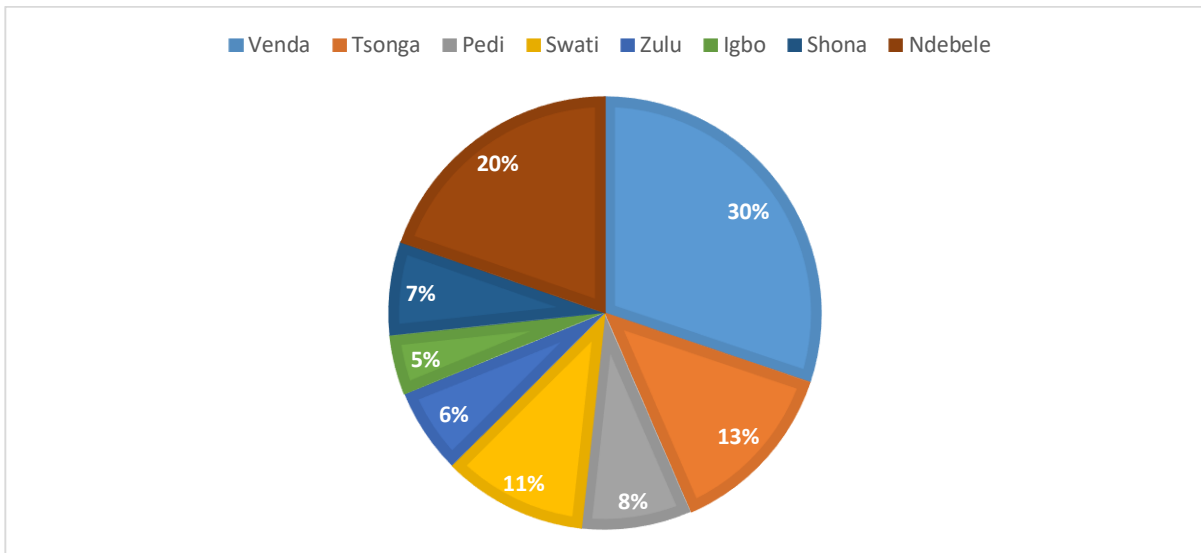


Figure 4.2: Cultural affiliation of respondents

4.3. Section B: Knowledge regarding MMC

The knowledge regarding MMC was graded using Bloom's cut-off point scoring on knowledge levels. The knowledge section had 16 questions in which they had Yes/No responses whereby the Yes was regarded as a correct answer and No as incorrect. Therefore, the score ranged between 0-16, and overlay the score of knowledge regarding MMC was defined as poor/low knowledge, average and high/adequate

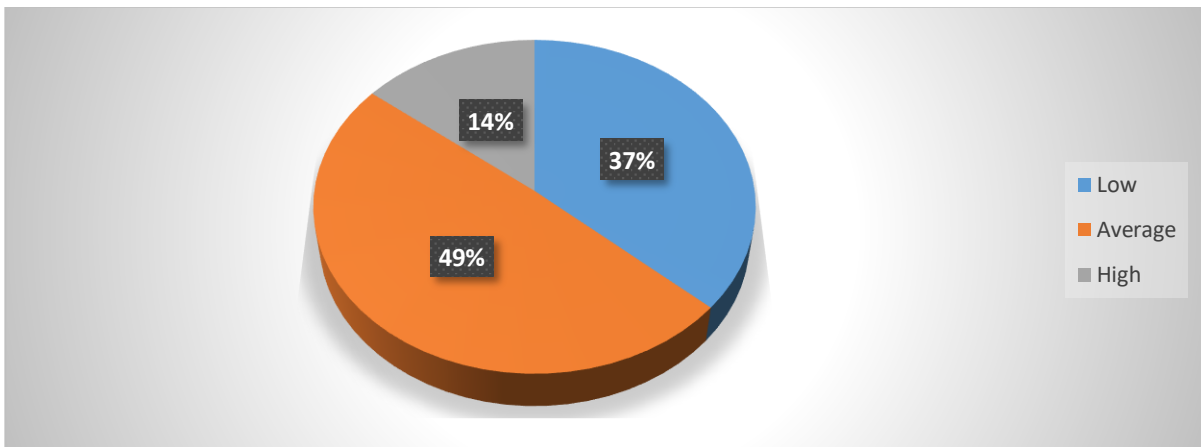


Figure 4.3: Knowledge regarding MMC

Figure 4.3 above shows that the response of the knowledge regarding MMC, the study, therefore, revealed that many respondents had average knowledge regarding MMC. Moreover, a worrisome percentage of 37% had low or poor knowledge level, however, 14% of adequate knowledge level cannot be ignored.

4.4. Section C: Attitude toward MMC

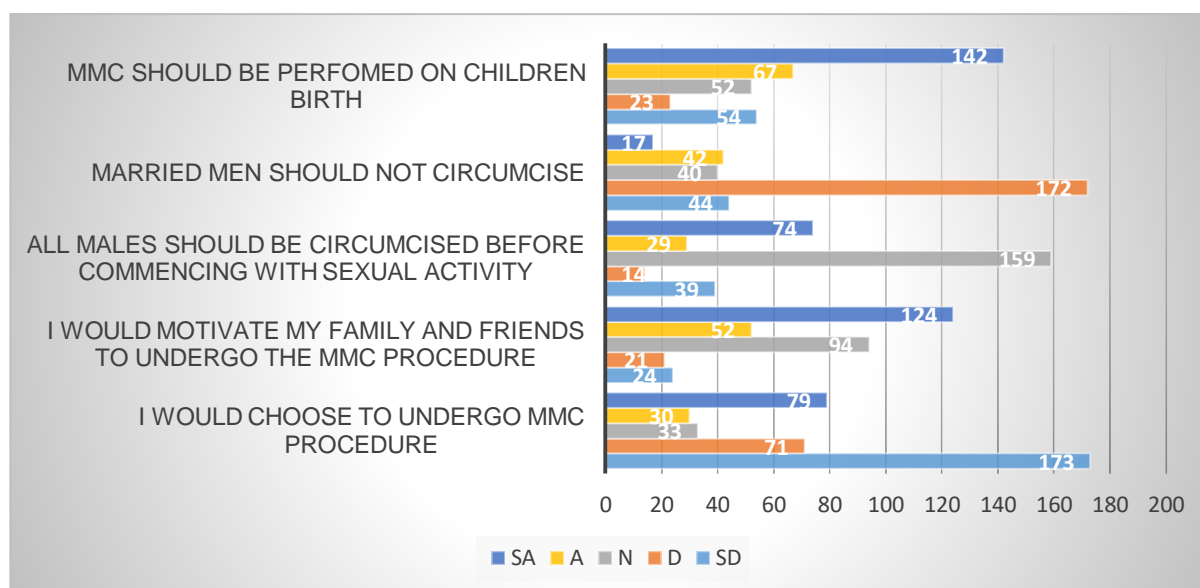


Figure 4.4: Attitudes towards MMC (N=315)

A high number of 159 respondents neutrally responded revealing that they are not sure if all males should be circumcised before engaging in sexual activities. Despite this, a notable number of those agreeing were 29 and strongly agreeing were 74 respectively, cannot be ignored though to a lesser extent. Furthermore, the study revealed that all married men should be circumcised, though a minority did not agree with this assertion. The study moreover indicated that the MMC should be performed on children at birth and a higher number agreed and strongly agreed respectively to this statement. In summation, the majority which was 54.9% of the respondents did not want to undergo circumcision, rather they strongly agreed that they can only motivate family friends and relative to go for MMC.

4.5. Section D: Perception regarding MMC

Table 4.2: Below shows the perception of students regarding MMC, 54.0% perceived MMC as causing pain and 47% as a procedure that can reduce the penis size. There was a considerable response that disagreed that VMMC does not include excessive bleeding, however, the 35.6% neutral response left a puzzle with missing links regarding the perception of students regarding MMC. The study established that 38.7% and 9.2% agreed respectively that the MMC takes too long to heal and this response was against the neutral percentage of 21.9% and those who disagreed were 21.9% as well. There was no available data on the assertion that MMC might cut off the penis as 47.3% didn't respond, however, the MMC was condemned by 33% and 10.2% respectively who agreed it can cause dangerous sexual behavior which includes unprotected sex. There was also a perception that MMC can

decrease sexual satisfaction from 73% of respondents and 48.9% also attested that MMC doesn't guarantee total immunity from infections. Erectile dysfunction and problems regarding the reproductive system were perceived to be because of MMC.

Table 4.2: Perception regarding MMC

Statement	SA		A		N		D		SD	
	N	%	n	%	N	%	N	%	n	%
MMC causes pain	170	54.0	53	16.8	54	17.1	25	7.9	13	4.1
MMC reduces the size of the penis	40	12.7	148	47.0	53	16.8	65	20.6	9	2.9
Excessive bleeding might occur during the procedure	33	10.5	59	18.7	112	35.6	55	17.5	24	7.6
The MMC wound takes too long to heal	122	38.7	29	9.2	69	21.9	26	8.3	69	21.9
My penis/my partner's penis might get cut off during the procedure	25	7.9	14	4.4	100	31.7	27	8.6	--	--
MMC will increase risky sexual behaviours e.g. no condom use	87	27.6	45	14.3	47	14.9	104	33.0	32	10.2
I will not get sexual satisfaction after circumcision	43	13.7	230	73.0	24	7.6	8	2.5	10	3.2
My partner will still contract infections even after circumcision	21	6.7	154	48.9	39	12.4	90	28.6	11	3.5
MMC will affect the reproductive system, making it difficult for males to have children	28	8.9	34	10.8	175	55.6	20	6.3	58	18.4
Being circumcised may cause erectile dysfunction	41	13.0	118	37.5	93	29.5	47	14.9	16	5.1
The number of sperms count decrease after MMC	13	4.1	37	11.7	103	32.7	144	45.7	18	5.7
MMC makes it easier for HIV infection in both males and their female partners	19	6.0	64	20.3	120	38.1	98	31.1	14	4.4

KEY=SA-Strongly Agree, A-Agree, N- Neutral, D-Disagree, SD- Strongly Disagree

4.6. Statistical tests

The statistical tests were conducted to ascertain the association between the demographic characteristics and the study variables and this was done through cross-tabulation and chi-square test with a significance level of 0.005.

4.6.1 Knowledge regarding MMC and gender

Table 4.3: Association between gender and knowledge regarding MMC

MMC doesn't prevent HIV infection				
		<i>(141.383, p=0.000)</i>		Total
		Yes	No	
Gender of Respondents	Male	202	0	202
	Female	26	44	70
Total		228	44	272
The foreskin harbours cells that are susceptible to HIV infection				
		<i>x²=56.408, p=0.000</i>		Total
		Yes	No	
Gender of Respondents	Male	202	0	202
	Female	5	62	67
Total		207	62	269
MMC reduces homosexual (same-sex) HIV infection by 60%				
		<i>(185.323p=0.000)</i>		Total
		Yes	No	
Gender of Respondents	Male	202	0	202
	Female	35	78	113
Total		237	78	315

The findings from the chi-square and cross-tabulation were statistically significant between knowledge level and gender.

The table 4.4 below shows the relationship between cultural affiliation and the attitudes towards MMC. The cross-tabulation and the chi-square findings were significant, which means that the attitudes towards this present intervention can be determined by cultural background or affiliation.

4.6.2 Attitude towards MMC and cultural affiliation

Table 4.4: Association between attitudes towards MMC and cultural affiliation

I would motivate my family and friends to undergo the MMC procedure							
		$(\chi^2=449.111, p=0.000)$					Total
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Cultural Affiliation	Venda	24	21	50	0	0	95
	Tsonga	0	0	22	20	0	42
	Pedi	0	0	0	26	0	26
	Swati	0	0	0	6	28	34
	Zulu	0	0	0	0	20	20
	Igbo	0	0	0	0	14	14
	Shona	0	0	0	0	22	22
	Ndebele	0	0	22	0	40	62
Total		24	21	94	52	124	315

Married man shouldn't circumcise							
		$(\chi^2=534.227, p=0.000)$					Total
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Cultural Affiliation	Venda	0	2	34	42	17	95
	Tsonga	0	36	6	0	0	42
	Pedi	8	18	0	0	0	26
	Swati	34	0	0	0	0	34
	Zulu	2	18	0	0	0	20
	Igbo	0	14	0	0	0	14
	Shona	0	22	0	0	0	22
	Ndebele	0	62	0	0	0	62
Total		44	172	40	42	17	315

Table 4.5 below illustrates the association between the perceptions of students regarding MMC and academic level. The findings were statistically significant that the perceptions of students regarding MMC are determined by their academic level.

4.6.3 Academic level and perceptions regarding MMC

Table 4.5: Association between academic level and perceptions regarding MMC

MMC will increase risky sexual behaviours e.g. no condom use							
		$(\chi^2=456.452; p=0.000)$					Total
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	
Academic Level	1st Year	4	27	0	0	0	31
	2nd Year	0	32	0	0	0	32
	3rd Year	28	0	21	0	0	49
	Postgraduate	0	45	26	45	87	203
Total		32	104	47	45	87	315
The MMC wound takes too long to heal							
		$(\chi^2=447.565; p=0.000)$					Total
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	
Academic Level	1st Year	13	18	0	0	0	31
	2nd Year	0	8	24	0	0	32
	3rd Year	49	0	0	0	0	49
	Postgraduate	7	0	45	29	122	203
Total		69	26	69	29	122	315

4.7. Conclusion

This chapter presented the findings and frequencies, percentages and charts were used to illustrate the knowledge, attitudes and perceptions of students regarding MMC. The next chapter is a discussion of the study findings.

CHAPTER 5

DISCUSSION OF STUDY FINDINGS

5.1. Introduction

This study explored the knowledge, attitudes, and perceptions of students regarding MMC at a tertiary institution. The study findings were presented and interpreted in chapter four, therefore this section discusses the findings of the study utilising the literature provided in chapter two using the aims and objective of the study. Specifically, the study aimed to assess the knowledge of the University of Venda students about MMC, to determine the attitudes of the students towards MMC and to describe their perceptions regarding MMC.

In summation, the study revealed low knowledge levels with mixed perceptions regarding MMC which resulted in negative attitude towards MMC. This study presents findings which are contrary to the study done in Haiti whereby significant contributions to the scant literature were found with healthcare providers' attitudes and knowledge of MMC in which a large proportion of healthcare providers were willing to undergo training to conduct MMC to demonstrate high levels of knowledge and positive attitudes towards MMC (Devieux et al., 2015).

5.2. Knowledge, Attitudes, and Perceptions regarding MMC

The study was conducted on the male and female population at the University of Venda, Limpopo province and results revealed that the age of the majority respondents ranged from 19 to 30 years with the majority being males. In addition, the male respondents were all below the age of 26 as shown by the cross-tabulation, only female respondents were over the age of 26 years. Similarly, Mangombe (2017) conducted a study on circumcision among males and revealed that the median age was 29 years, however, the downside of this age limit is that it excluded males who are over 26 years (probably the married age) who are also affected by the HIV epidemic, thereby missing out on their views on MMC.

Moreover, the current study did not solicit female's views who are below 18 years which is also vital in the MMC decision-making process as they are equally affected. Since education provides people with the knowledge and skills that can lead to a better quality of life, in this study 64.4% of the respondents were post-graduate students suggesting that the literacy levels might be high. In a supporting view, a study by Kaufman et al. (2018) attests that the fact that the level of education may be high among respondents suggests that MMC implementers can utilize this vantage stance and focus on health education campaigns to promote MMC uptake. The study did not include the marital status of the respondents, which

the research thinks, if included might have added value to the views regarding MMC. This is because that marital status determines the sexual knowledge of an individual and the sexual knowledge is as well related to decision making regarding the MMC.

As discussed earlier on the conceptual framework, one of the components of the HBM is the demographic variable of the gender of the respondents which constituted of males and females who answered the questionnaire. The study revealed that the males were more knowledgeable than females. There was a significant positive relationship between knowledge and gender which according to Korieh (2005) males have additional information which is necessary for more knowledge to promote the acceptance of circumcision among all gender population. Most of the cultural affiliations were present in the sample which signified a fair cross-sectional representation. However, the Venda and Tsonga speakers were the majority regarding cultural affiliation which may be attributed to the Venda being the predominant cultural group in the Vhembe District.

In overall, the study can conclude that demographic variable influences the knowledge, attitudes, and perceptions regarding MMC and this was as well confirmed by similar findings from studies in traditionally non-circumcised societies in Tanzania, Zimbabwe, and South Africa indicated that factors such as higher levels of education, living in urban areas and marital status were associated with higher rates of circumcision among non-circumcising societies (Mangombe, 2017). However, the socio-economic status such as marital status, employment was not investigated on how they influence the rate of MMC in the current study.

Majority of the respondents in the present study had average knowledge regarding MMC for example that MMC should be performed by highly skilled and qualified health care providers and that the foreskin harbours cells which are susceptible to HIV infection. These results are similar to those of studies done in Botswana (Plank et al., 2010) in which more than 70% of the respondents had heard that MMC reduces the risk of acquiring HIV infection and more than 60% had heard that MC reduces the risk of acquiring STI thus showing the availability of information regarding MMC. Despite the average percentage which indicated little knowledge regarding MMC, the present study established that some respondents view circumcision as a substitute for condom use and they viewed MMC as not a prevention method of HIV. These present findings are contrary to a study conducted by Tobian and Gray (2011) in which it was noted a prevalent acceptance that there is an association between MC and health benefits (reduced risk of HIV and STI, penile hygiene enhancement). Although the present study did not establish the influence of culture on MMC knowledge a more detailed study supported that despite residing in the area where circumcision is seldom practiced and despite being

uncircumcised, the majority of men associate MC with better penile hygiene, even among those men who prefer to remain uncircumcised (Milford et al., 2016).

Although the present study suggested that all married men should be circumcised there was a low response rate on the assertion that all males should be circumcised before commencing sexual activity. Due to the lack of scientific information regarding MMC, the study indicated that the respondents think MMC should be performed on children at birth and were willing to motivate their relatives to circumcise. Furthermore, the study indicated that MMC can motivate riskier behavior among the sexually active group. This was similarly found in a study by Naidoo et al. (2012) in which it was stated that a perception that one is protected thus promoting male circumcision would cause an increase in riskier sexual behaviour and male circumcision would both undermine their existing protective behaviour and strategies.

The study revealed that student perceives MMC as causing too much pain and also reducing penis size. A study by Peltzer et al. (2009) concurred by stating that barriers to MMC were found to include fears of the procedure itself and the pain (including post-operative) associated with circumcision, and social barriers included stigma associated with HIV testing, pressures to engage in sex during the healing process and family disapproval of the procedure. Thus the perception of such individual fears about the MMC procedure can be identified as a prominent barrier to undergoing MMC as the study by Makamedi (2017) confirmed that the experiences of peers were often found to be an important consideration when deciding whether or not to undergo MMC. In trying to unbundle this perception Hoffman et al. (2015) observed that in partially medically circumcised men and medical circumcision providers raised concerns about HIV risk during traditional circumcision through the use of one instrument on more than one initiate and also the risk of circumcision complications even leading to death. Thus, this sentiment can reveal and explain the individual fears as a barrier to MMC.

The study established that majority of respondents' view MMC as a procedure that takes too long to heal which might be the reason to discourage them to motivate individuals who are planning to get circumcised. Peltzer et al. (2015) concurs with the present study that in some cases the causes of fear might be in circumstances where in post circumcision there was incomplete wound healing and little aftercare while sexual activity had already begun. Furthermore, a valid point raised in the WHO document can add to the cause of individual fears for example, according to WHO (2008), newly circumcised males should abstain from sex for about six weeks to ensure the penis is fully healed as they could be at increased risk of infection during this time, however, this can make individuals hesitate to abstain sex for such a time. In spite of this, whether the procedure takes place in a clinical or traditional setting

safety is of paramount importance. The present study further established that MMC can cause dangerous sexual behaviour which includes unprotected sex and a decrease the sexual satisfaction, and some perceiving MMC as a cause of erectile dysfunction and problems regarding reproductive system were perceived to be because of MMC. These findings are supported by previous studies (Lukobo & Bailey, 2007; Mavhu et al., 2011; Ngalande et al., 2006 & Scott et al., 2005) as they state that fears are usually driven by perceptions rather than experience for example, efforts by circumcised boys to prove their masculinity by emphasizing any painful experiences or 'horror stories' of the procedure become the fears of uncircumcised boys. Generally, some studies reiterate that that male circumcision was not associated with lower sexual inhibition, instead, in several cases traditionally and medically circumcised men had engaged too early in sex with multiple partners without a condom, and some traditionally and medically circumcised men experienced an increase in sexual desire and sexual pleasure post circumcision (Tsvere & Pedzisai, 2014).

In another study, findings suggested that the perception of false HIV safety, as some people may believe that MMC provides complete protection therefore, MC intervention programs must stress that circumcision does not provide complete protection from HIV/STIs and should not be considered a substitute for other prevention methods. In summary Hoffman et al. (2015) concluded that sexual dysfunction and false perceptions of immunity from HIV and STI's following circumcision, which may increase male-to-female transmission results in the increase of risky sexual behaviour following MMC due to misconceptions around the extent to which circumcision protects against HIV.

5.3. Conclusion

The study findings showed that most of the respondents generally have average knowledge and negative attitudes and misperceptions regarding MMC, hence the need for more education regarding MMC in order for them to change their behaviours towards MMC. This chapter therefore, discussed the findings of the study in relation to other studies and literature whereby gaps and similarities were identified.

CHAPTER 6

SUMMARY, LIMITATIONS, RECOMMENDATIONS AND CONCLUSION

6.1. Introduction

This chapter concludes the study, summarises the findings, discusses the limitations, and makes recommendations for practice, policy and further research.

6.2. Background of the study

MMC is an integral and a comprehensive strategy for HIV prevention for countries with heterosexually-driven epidemics, and the Republic of South Africa is one of the worst-affected by HIV/AIDS in the Southern sub-region of Africa (Tsvere & Pedzisai, 2014). Historically, in South Africa by the end of 2011, more than 1.3 million voluntary medical male circumcisions had been performed for HIV prevention, with nearly a doubling of the number from 2010 to 2011. Despite the recent increased pace, focused efforts are needed to achieve the number of MMC for maximum public health impact on HIV and AIDS (Grund et al., 2019). Key challenges include strengthening advocacy at all levels, exploring innovative approaches to service delivery, including the use of medical devices for adult circumcision, improving supply chain logistics, use of limited human resources, and creating demand for services.

6.3. Summary of the study

This study investigated the knowledge, attitudes, and perceptions regarding MMC among students in a tertiary institution. Specifically, the objectives sought to:

- Assess the knowledge of the University of Venda students about MMC
- Determine the attitudes of the University of Venda students towards MMC
- Describe the perceptions of the University of Venda students regarding MMC

A quantitative cross-sectional descriptive study design was used. The population of this study were all university students (both females and males) residing in the University of Venda campus as of January 2020, where a sample of 315 students was drawn systematically from residential halls. Slovin's formula was used to determine the sample size. The systematic random sampling was used to select rooms from which respondents were chosen. A self-administered questionnaire was provided in English without translation. It comprised of four sections, namely, demography, knowledge, attitudes, and perceptions regarding medical male circumcision. Descriptive statistics using the statistical product and service solutions (SPSS) version 25.0 was used to analyse the data collected. The study revealed that majority of respondents generally have average knowledge, negative attitudes and misperceptions

regarding MMC, hence the need for more education regarding MMC for them to change their behaviours towards MMC. In overall, the knowledge regarding MMC was average, particularly its potential to reduce the risk of HIV infection, STIs and enhance penile hygiene exists, with many displaying poor lack of knowledge about circumcision. Given that information obtained from this study provides insight on knowledge, attitudes, and perceptions towards MMC at the University of Venda. Despite the average knowledge regarding MMC which might have resulted in negative attitudes and misperceptions, this study revealed that barriers to effective implementation still exist and these barriers include the fear of pain associated with the procedure, the fear of complications. However, the study findings might be useful to health policymakers in the design of health education programs to improve the MMC program in tertiary institutions

6.4. Study Limitation

Various challenges were faced during the course of the study. Firstly, the data collected was University-based which is not representative of the overall population of male and female adults of the same characteristics, therefore, the findings could not be generalised. However, it can be good for comparison. In addition, the study utilized self-administered questionnaires to obtain data which would result in participants having no time to time to clarify any questions. Therefore, the questionnaire was simplified as suggested by the experts. Thus, the information given might not be a true reflection of their views.

6.5. Recommendations

Taking the study findings into consideration, the following recommendations are proposed:

6.5.1 Recommendation for practice

- There is a need to acknowledge the necessity for adequate education and awareness-raising campaigns on MMC for HIV prevention. It is crucial to ensure the dissemination of accurate and information, highlighting the MMC health benefits in STI and HIV prevention particularly in communities (particularly tertiary institution) with lower levels of education. Information communication should emphasize that MMC does not provide absolute protection of HIV infection.
- Advocates, implementers and local governments through national policies should articulate and provide understandable and accurate information to the students and highlighting the risks and benefits of MMC for HIV prevention. From this study, it is recommended that a change in behaviour communication campaign for both women and men would help strengthen the facilitators of MMC and identify the perceived

barriers to MMC. This can be done through University discussion approaches aiming to change some of the negative perceptions mentioned in this study. Therefore, medical male circumcision should be encouraged to minimize the risk of complications that may arise from traditional male circumcision procedures.

- Given the cultural perception as discussed in this study, to promote the uptake of MMC, there is need to train medical personnel involved in performing MC, as well as to increase the collaboration between the traditional and medical circumcisers. This is to increase the level of quality of MMC services, thus increase acceptability

6.5.2 Recommendation for policy

- The MEC of Health Limpopo should consider expanding MMC services to underserved areas since the inability to access MMC services is one of the major barriers. Male circumcision should be offered free of charge or at a nominal fee with health facilities prepared, accommodate and scale upon circumcision on male children.

6.5.3 Recommendation for further studies

- Further studies on the knowledge, attitudes and perception regarding MMC is recommended, to uncover more gaps that might have been missed through this study. Moreover, a mixed approach and a bigger sample is recommended for a better understanding of the phenomenon.

6.6 Conclusion

This chapter presented the conclusion, recommendation, implication as well as the limitation of the present study. The recommendation was derived from the discussion and they were divided into practice, policy and further research.

7. REFERENCES

- Auvert, B., Taljaard, D., Lagarde, E., Sobngwi-Tambekou, J., Sitta, R. and Puren, A., 2005. Randomized controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 Trial. *PLoS medicine*, 2(11), p. e298.
- Borgdorff, M.W., Kwaro, D., Obor, D., Otieno, G., Kamire, V., Odongo, F., Owuor, P., Muthusi, J., Mills, L.A., Joseph, R. and Schmitz, M.E., 2018. HIV incidence in Western Kenya during scale-up of antiretroviral therapy and voluntary medical male circumcision: a population-based cohort analysis. *The lancet HIV*, 5(5), pp.e241-e249.
- Burns, N, and Groove, S.K., 2020. *The practice of Nursing Research: Appraisal, Synthesis, and Generation of evidence* (9th ed). Saunders: Elsevier
- Brink, H., Van der Walt, C and Van Rensburg, G., 2017. *Fundamental of Research methodology for health care professionals*.4th ed. South Africa: Juta Legal and Academic Publishers.
- Chikutsa, A., 2011. *Contextualizing the adaption of Male Circumcision as an HIV prevention strategy in Zimbabwe*. Zimbabwe Open University, 115(3).
- Chimuti, A., 2013. "Knowledge, perceptions and attitudes of males in Bindura urban (Zimbabwe) towards medical male circumcision (MMC)", Doctoral dissertation, Stellenbosch: Stellenbosch University.
- Chyi, L.S. and San, N.S., 2016. Review of the Prescribing Pattern in Post Circumcision in Hospital Kanowit: Retrospective Cross Sectional Study. *Sarawak Journal of Pharmacy* 1 63-78.
- Circumcision, T.F.O., 2012. Male circumcision. *Pediatrics*, pp.peds-2012. CRC Press.
- Cork, M.A., Wilson, K.F., Perkins, S., Collison, M.L., Deshpande, A., Eaton, J.W., Earl, L., Haeuser, E., Justman, J.E., Kinyoki, D.K. and Mayala, B.K., 2020. Mapping male circumcision for HIV prevention efforts in sub-Saharan Africa. *BMC medicine*, 18(1), pp.1-15.
- Creswell, J.W and Cresswell J.D., 2017. *Research designs- qualitative, quantitative and mixed methods approaches*. 5th ed. United States: Sage publishers
- Déviex, J.G., Saxena, A., Rosenberg, R., Klausner, J.D., Jean-Gilles, M., Madhivanan, P., Gaston, S., Rubens, M., Theodore, H., Deschamps, M.M. and Koenig, S.P., 2015. Knowledge,

attitudes, practices and beliefs about medical male circumcision (MMC) among a sample of health care providers in Haiti. *Plos one*, 10(8), p.e0134667.

Dévieux, J.G., Saxena, A., Rosenberg, R., Klausner, J.D., Jean-Gilles, M., Madhivanan, P., Gaston, S., Rubens, M., Theodore, H., Deschamps, M.M. and Koenig, S.P., 2015. Knowledge, attitudes, practices and beliefs about medical male circumcision (MMC) among a sample of health care providers in Haiti. *Plos one*, 10(8), p.e0134667.

Faleye, A., 2014. Knowledge of HIV and benefits of male medical circumcision amongst clients in an urban area. *African journal of primary health care & family medicine*, 6(1), pp.1-5.

Fenollar, P., Román, S. and Cuestas, P.J., 2007. University students' academic performance: An integrative conceptual framework and empirical analysis. *British Journal of Educational Psychology*, 77(4), pp.873-891.

Gilbertson, A., Ongili, B., Odongo, F.S., Hallfors, D.D., Rennie, S., Kwaro, D and Luseno, W.K., 2019. Voluntary medical male circumcision for HIV prevention among adolescents in Kenya: Unintended consequences of pursuing service-delivery targets. *PLoS One*. Nov 4;14(11):e0224548. doi: 10.1371/journal.pone.0224548. PMID: 31682626; PMCID: PMC6827911.

Gisslen, M., Svedhem, V., Lindborg, L., Flamholc, L., Norrgren, H., Wendahl, S., Axelsson, M. and Sönnernborg, A., 2017. Sweden, the first country to achieve the Joint United Nations Programme on HIV/AIDS (UNAIDS)/World Health Organization (WHO) 90-90-90 continuum of HIV care targets. *HIV medicine*, 18(4), pp.305-307.

Glanz, K., Rimer, B.K. and Viswanath, K. eds., 2015. Health behavior: Theory, research, and practice. John Wiley & Sons.

Govender, V., 2015. The role of internal communication in the transition process at the Durban University of Technology (DUT). Doctoral dissertation.

Grabowski, M.K., Serwadda, D.M., Gray, R.H., Nakigozi, G., Kigozi, G., Kagaayi, J., Ssekubugu, R., Nalugoda, F., Lessler, J., Lutalo, T. and Galiwango, R.M., 2017. HIV prevention efforts and incidence of HIV in Uganda. *New England Journal of Medicine*, 377(22), pp.2154-2166.

Grund, J.M., Chetty-Makkan, C.M., Ginindza, S., Munyai, R., Kisbey-Green, H., Maraisane, M. and Charalambous, S., 2018. Effectiveness of an “Exclusive Intervention Strategy” to increase

Medical Male Circumcision uptake among men aged 25–49 years in South Africa. *BMC public health*, 18(1), p.868.

Hines, J.Z., Ntsuape, O.C., Malaba, K., Zegeye, T., Serrem, K., Odoyo-June, E., Nyirenda, R.K., Msungama, W., Nkanaunena, K., Come, J. and Canda, M., 2017. Scale-up of voluntary medical male circumcision services for HIV prevention—12 countries in Southern and Eastern Africa, 2013–2016. *MMWR. Morbidity and mortality weekly report*, 66(47), p.1285.

Hoffman, J.R., Arendse, K.D., Larbi, C., Johnson, N. and Vivian, L.M., 2015. Perceptions and knowledge of voluntary Medical Male Circumcision for HIV prevention in traditionally noncircumcising communities in South Africa. *Global public health*, 10(5-6), pp.692-707.

Howard-Payne, L., 2016. Voluntary medical adult male circumcision for HIV prevention in South Africa: The tensions between medicalised modernity and traditional practices. *Psychology in Society*, (52), pp.19-43.

Ikwegbue, J.N., Ross, A and Ogonnaya, H., 2015. Rural Zulu women's knowledge of and attitudes towards MMC. *Afr J Prm Health Care Fam Med*.7(1), Art. #775, 6 pages.

Jeofrey, M., Zivanai, S. and Gwendoline, S. 2013. Attitude of Mildands State University Students towards Male Circumcision as A way of Reducing Hiv Transmission. *Science*, 57, pp.9-25.

Kaufman, M.R., Patel, E.U., Dam, K.H., Packman, Z.R., Van Lith, L.M., Hatzold, K., Marcell, A.V., Mavhu, W., Kahabuka, C., Mahlasela, L. and Njeuhmeli, E., 2018. Impact of counselling received by adolescents undergoing voluntary medical male circumcision on knowledge and sexual intentions. *Clinical Infectious Diseases*, 66(suppl_3), pp.S221-S228.

Kharkhar, M. and Bowalekar, S., 2012. Knowledge, Attitude and perception/ practices(KAP) of medical practitioners in India towards adverse drug reaction (ADR) reporting. *Perspectives in clinical research*, 3(3), p.90.

Kip, E., Ehlers, V.J. and Van Der Wal, D.M., 2009. Patients' adherence to anti-retroviral therapy in Botswana. *Journal of Nursing Scholarship*, 41(2), pp.149-157.

K'Odhiambo, A.K., 2019. Male Circumcision: Historical and Religious Background. In *Complications in Male Circumcision* (pp. 11-15). Elsevier.

Korieh, C., 2005. 'Other' Bodies: Western Feminism, Race, and Representation in Female Circumcision Discourse. Female circumcision and the politics of knowledge: African women in imperialist discourses, pp.111-32.

Krieger, J.N., 2019. Does Male Circumcision Reduce Women's Risk of Sexually Transmitted Infections, Cervical Cancer, and Associated Conditions? *Frontiers in public health*, 7.

Lane, C., Bailey, R.C., Luo, C. and Parks, N., 2018. Adolescent male circumcision for HIV prevention in high priority countries: Opportunities for improvement. *Clinical Infectious Diseases*, 66(suppl_3), pp.S161-S165.

Launiala, A., 2009. How much can a KAP survey tell us about people's knowledge, attitudes, and practices? Some observations from medical anthropology research on malaria in pregnancy in Malawi. *Anthropology Matters*, 11(1).

Ledikwe, J.H., Mawandia, S., Kleinman, N.J., Ntsuape, C., Ramabu, N.M., Semo, B.W and Wirth, K.E., 2020. Voluntary Medical Male Circumcision and Perceived Sexual Functioning, Satisfaction, and Risk Behavior: A Qualitative Study in Botswana. *Arch Sex Behav*. Apr;49(3):983-998. doi: 10.1007/s10508-019-01589-7. Epub 2020 Jan 29. PMID: 31997131.

Linsenmeyer, T.A., 1993. Urologic anatomy and physiology. *Physical Medicine and Rehabilitation Clinics*, 4(2), pp.221-247.

Lissouba, P., Taljaard, D., Rech, D., Dermaux-Msimang, V., Legeai, C., Lewis, D., Singh, B., Puren, A. and Auvert, B., 2011. Adult male circumcision as an intervention against HIV: An operational study of uptake in a South African community (ANRS 12126). *BMC infectious diseases*, 11(1), pp.1-12.

Lukobo, M.D. and Bailey, R.C., 2007. Acceptability of male circumcision for prevention of HIV infection in Zambia. *AIDS care*, 19(4), pp.471-477.

Magodyo, T., Andipatin, M. and Jackson, K., 2017. The role of Xhosa traditional circumcision in constructing masculinity. *South African Journal of Psychology*, 47(3), pp.344-355.

Makamedi, T., 2017. Male circumcision and consistent condom use in South Africa. Doctoral dissertation.

Mangombe, K., 2017. Factors influencing circumcision of young males in Harare, Zimbabwe. Doctoral dissertation, North-West University. South Africa.

Marais, L., Toefy, Y., Thompsen, S., Diwan, V., Skinner, D., Mofolo, N., Lenka, M. and Cloete, J., 2019. Targeting for male medical circumcision: profiles from two South African cities. *AIDS care*, pp.1-5.

Mavhu, W., Frade, S., Yongho, A.M., Farrell, M., Hatzold, K., Machaku, M., Onyango, M., Mugurungi, O., Fimbo, B., Cherutich, P. and Rech, D., 2014. Provider attitudes toward the voluntary MMC scale-up in Kenya, South Africa, Tanzania, and Zimbabwe. *PloS one*, 9(5), p. e82911.

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 MMC 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.

Morris, B. J., Hankins, C. A., Banerjee, J., Lumbers, E. R., Mindel, A., Klaussner, J. D., and Krieger, J. N. (2019). Does Male Circumcision Reduce Women's Risk of Sexually Transmitted Infections, Cervical Cancer, and Associated Conditions? *Frontiers in public health*, 7, 4. <https://doi.org/10.3389/fpubh.2019.00004>

Morris, B.J. and Krieger, J.N., 2019. Non-therapeutic male circumcision. *Paediatrics and Child Health*.

Morris, B.J., Hankins, C.A., Banerjee, J., Lumbers, E.R., Mindel, A., Klaussner, J.D. and Morris, B.J., Wamai, R.G., Henebeng, E.B., Tobian, A.A., Klausner, J.D., Banerjee, J. and Hankins, C.A., 2016. Estimation of country-specific and global prevalence of male circumcision. *Population health metrics*, 14(1), pp.1-13.

Mosby's Medical Dictionary. 2017.Elsevier

Mothiba, T.M. and Bopape, M.A., 2019. Views of Male Community Elders with Regards to Medical Male Circumcision at Pfanani Clinic in Limpopo Province, South Africa. *Global Journal of Health Science*, 11(6).

Munro, B.H., 2005. *Statistical methods for health care research* (Vol. 1). Lippincott Williams & Wilkins.

Naidu, M. and Khumalo, S., 2016. I am circumcised so HIV/AIDS can't touch me!? Young Black African University Men and Narratives of Masculinity. *The Oriental Anthropologist*, 16(1), pp.163-181.

Ngalande, R.C., Levy, J., Kapondo, C.P. and Bailey, R.C., 2006. Acceptability of male circumcision for prevention of HIV infection in Malawi. *AIDS and Behaviour*, 10(4), pp.377-385.

Ngodji, T.K., 2010. Knowledge, attitudes and practices of male circumcision for HIV prevention among voluntary counselling and testing clients in Onandjokwe District Hospital, Namibia. Doctoral dissertation, University of the Western Cape.

Nxumalo, C.T. and Mchunu, G.G., 2020. Zulu Men's Conceptions, Understanding, and Experiences of Voluntary Medical Male Circumcision in KwaZulu-Natal, South Africa. *American journal of men's health*, 14(2), p.1557988319892437.

Pagano, M. and Gauvreau, K., 2018. Principles of biostatistics. 2nd ed. United States of America.

Peltzer, K and Kanta, X., 2009. Medical circumcision and manhood initiation rituals in the Eastern Cape, South Africa: a post intervention evaluation. *Culture, health & sexuality*, 11(1), pp.83-97.

Peltzer, K., Kalichman, S., Simbayi, L. and Banyini, M., 2009. Knowledge, attitudes and beliefs about male circumcision and HIV by traditional and medical providers of male circumcision and traditionally and medically circumcised men in Mpumalanga, South Africa. *Gender and Behaviour*, 7(2), pp.2394-2429.

Plank, R.M., Makhema, J., Kebaabetswe, P., Hussein, F., Lesetedi, C., Halperin, D., Bassil, B., Shapiro, R. and Lockman, S., 2010. Acceptability of infant male circumcision as part of HIV prevention and male reproductive health efforts in Gaborone, Botswana, and surrounding areas. *AIDS and behaviour*, 14(5), pp.1198-1202.

Riess, T.H., Achieng, M.M. and Bailey, R.C., 2014. Women's beliefs about male circumcision, HIV prevention, and sexual behaviours in Kisumu, Kenya. *PloS one*, 9(5), p.e97748.

Riess, T.H., Achieng, M.M., Otieno, S., Ndinya-Achola, J.O. and Bailey, R.C., 2010. "When I was circumcised I was taught certain things": risk compensation and protective sexual behaviour among circumcised men in Kisumu, Kenya. *PloS one*, 5(8), p.e12366.

Rosenstock, I.M., Strecher, V.J. and Becker, M.H., 1988. Social learning theory and the health belief model. *Health education quarterly*, 15(2), pp.175-183.

Sangweni, P.N., Mavundla, T.R. and Moabi, P.S., 2019. Factors hindering effective uptake of Medical Male Circumcision at Untunjambili area in KwaZulu-Natal, South Africa. *Health SA Gesondheid (Online)*, 24, pp.1-6.

Scott B.E., Weiss, H.A and Viljoen, J.I., 2005. The acceptability of male circumcision as an HIV intervention among a rural Zulu population, Kwazulu-Natal, South Africa. *AIDS Care* 17(3): 304–31

Sengwayo, S.F. 2011. Men's Knowledge, understanding and factors influencing their beliefs about male circumcision in rural communities in Northern KwaZulu-Natal, South Africa Doctoral dissertation, University of Cape Town.

Siddhanta, A.N.K.I.T.A. and Sinha, A.T.R.E.Y.E.E., 2016. Attitude and perception towards female circumcision: A study of vulnerability among women in Kenya and Nigeria. *The Journal of Family Welfare*, 62, p.15.

Singh, V. and Thurman, A., 2019. How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018). *American Journal of Distance Education*, 33(4), pp.289-306.

Stats, S.A., 2017. *Statistics South Africa*. Formal census.

Tobian, A.A. and Gray, R.H., 2011. The medical benefits of male circumcision. *jama*, 306(13), pp.1479-1480.

Tobian, A.A., Serwadda, D., Quinn, T.C., Kigozi, G., Gravitt, P.E., Laeyendecker, O., Charvat, B., Ssempijja, V., Riedesel, M., Oliver, A.E. and Nowak, R.G., 2009. Male circumcision for the prevention of HSV-2 and HPV infections and syphilis. *New England Journal of Medicine*, 360(13), pp.1298-1309.

Tsvere, M. and Pedzisai, C., 2014. Attitudes of University Students towards Male Circumcision. *International Journal of Innovative Research and Development*|| ISSN 2278–0211, 3(2).

Vangen, S., Hoffmann, R., Flo, K., Lorentzen, B. and Sand, S., 2006. Female circumcision-- complications and treatment. *Tidsskrift for den Norske laegeforening: tidsskrift for praktisk medicine, ny raekke*, 126(4), pp.475-477.

Wambura, M., Mwanga, J.R., Mosha, J.F., Mshana, G., Mosha, F. and Chagalucha, J., 2011. Acceptability of medical male circumcision in the traditionally circumcising communities in Northern Tanzania. *BMC public health*, 11(1), pp.1-8.

Waters, E., Li, M., Mugisa, B., Bowa, K., Linyama, D., Stringer, E. and Stringer, J., 2013. Acceptability and uptake of neonatal male circumcision in Lusaka, Zambia. *AIDS and Behaviour*, 17(6), pp.2114-2122.

World Health Organization, 2015. Voluntary medical male circumcision for HIV prevention in 14 priority countries in East and Southern Africa: WHO progress brief (No. WHO/HIV/2015.21). *World Health Organization*.

World Health Organization, 2016. Tetanus and voluntary medical male circumcision: risk according to circumcision method and risk mitigation. Report of the WHO Technical Advisory Group on Innovations in Male Circumcision—consultative review of additional information, 12 August 2016 (No. WHO/HIV/2016.19). *World Health Organization*.

World Health Organization, 2018. Male circumcision for HIV prevention: manual for male circumcision under local anaesthesia and HIV prevention services for adolescent boys and men.

World Health Organization, 2019. Voluntary medical male circumcision: remarkable progress in the scale up of VMMC as an HIV prevention intervention in 15 ESA countries (No. WHO/CDS/HIV/19.50). *World Health Organization*.

Yardley, L., 2017. Demonstrating the validity of qualitative research. *The Journal of Positive Psychology*, 12(3), pp.295-296.

Zampieri, N., Pianezzola, E. and Zampieri, C., 2008. Male circumcision through the ages: the role of tradition. *Acta Paediatrica*, 97(9), pp.1305-1307.

8. APPENDICES

APPENDIX A : QUESTIONNAIRE ON MMC

LANGUAGE – ENGLISH

Please respond by a tick (☐) in an appropriate box or fill in the dotted line/box where applicable

1. Personal information

1.1 Age

1.2 Gender

Male	Female
<input type="checkbox"/>	<input type="checkbox"/>

1.3 Residential block

Residential block	Tick (☐)
Riverside	<input type="checkbox"/>
F5	<input type="checkbox"/>
F4	<input type="checkbox"/>
F3	<input type="checkbox"/>
Bernard Ncube	<input type="checkbox"/>
Mango Groove	<input type="checkbox"/>
Carrousel	<input type="checkbox"/>
Lost city girls	<input type="checkbox"/>
Lost city boys	<input type="checkbox"/>

1.4 Country of origin

South Africa	<input type="checkbox"/>
Other, specify	<input type="checkbox"/>

1.5 Cultural affiliation

Culture	Tick (☐)
Venda	<input type="checkbox"/>

Tsonga	
Pedi	
Swati	
Zulu	
Other, specify	

1.6 Current academic level

Academic level	1 st year	2 nd year	3 rd year	4 th year	Postgraduate
Tick (☐)					

2. Knowledge about MMC

Please respond by a tick (☐) in an appropriate box

	Yes	No
2.1 MMC is performed surgically by highly skilled qualified health care providers		
2.2 MMC can be performed throughout the year		
2.3 Not all males can undergo circumcision at any age		
2.4 The foreskin harbours cells which are susceptible to HIV infection		
2.5 The foreskin is prone to tearing, which creates an entry point for HIV		
2.5 MMC reduces homosexual (same-sex) HIV infection by 60%		
2.6 Circumcision is a substitute for condom use		
2.7 Men who are not circumcised are more likely to get HIV than those that are circumcised		
2.8 MMC doesn't prevent HIV infection		
2.9 A circumcised man can still contract HIV when having unprotected sex with an infected woman		
2.10 A circumcised male cannot transmit HIV to a woman		
2.11 MMC reduces chances of HPV infection in males which contribute a reduction of cervical cancer in women		
2.12 MMC has no benefits for the female partner		
2.13 MMC reduces HIV transmission		
2.14 MMC reduces the chances of getting both ulcerative and discharge types of sexually transmitted infections		

2.15 MMC is a therapy for some medical condition like Phymosis (Inability of the foreskin to retract)		
--	--	--

3. Attitude towards MMC

Please respond by a tick () in an appropriate box

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
3.1 I would choose to undergo MMC procedure					
3.2 I would motivate my family and friends to undergo the MMC procedure					
3.3 All males should be circumcised before commencing with sexual activity					
3.4 Married men should not circumcise					
3.5 MMC should be performed on children at birth					

4. Perception regarding MMC

Please respond by a tick () in an appropriate box

	Strongly Agree	Disagree	Neutral	Agree	Strongly Agree
4.1 MMC causes pain					
4.2 MMC reduces the size of the penis					
4.3 Excessive bleeding might occur during the procedure					
4.4 The MMC wound takes too long to heal					

4.5 My penis/my partner's penis might get cut off during the procedure					
4.6 MMC will increase risky sexual behaviours e.g. no condom use					
4.7 I will not get sexual satisfaction after circumcision					
4.8 my partner will still contract infections even after circumcision					
4.9 MMC will affect the reproductive system, making it difficult for males to have children					
4.10 Being circumcised may cause erectile dysfunction					
4.11 The number of sperms count decrease after MMC					
4.12 MMC makes it easier for HIV infection in both males and their female partners					

APPENDIX B: INFORMATION LETTER

Title of the Research Study: Knowledge, Attitude, and Perception of university students regarding MMC at the University of Venda, Limpopo South Africa

Principal Investigator/s/ researcher: T F MATLALA, MASTER'S IN PUBLIC HEALTH

Co-Investigator/s/supervisor/s : DR MABUNDA J.T, PhD IN NURSING
MR MANGANNYE BS, MPH

Brief Introduction and Purpose of the Study:

I, Tshiko Frank Matlala, hereby inform you that we are conducting research titled "Knowledge, Attitude and Perception of university students regarding MMC at the University of Venda, South Africa". We invite you to participate in the study. This leaflet will provide you with the information needed for you to make an informed decision. Before you decide if you want to take part in the study or not you should fully understand the contents of this letter which highlights details of the study. If you have further questions that haven't been answered or explained in the leaflet, please do not hesitate to ask the researcher.

The purpose of the study is to assess the knowledge, attitude, and perception of university students regarding MMC at the University of Venda, South Africa.

Outline of the Procedures :

The study involves only filling in a questionnaire and the researcher will interpret the results at his own time. No verbal questions will be asked by the researcher.

Risks or Discomforts to the Respondent:

There is no risk of participating in the study.

Benefits:

Although the study might not have direct benefits to you, the study results will enable us to initiate programs to scale up MMC at the university level.

Reason/s why the Respondent May Be Withdrawn from the Study:

Your participation in the study is voluntary, and you can refuse to participate or withdraw at any time without giving reasons and your withdrawal will not affect you in any way.

Remuneration:

Your participation is voluntary. No remuneration will be given to you for participation.

Costs of the Study:

The study is free; therefore, no cost will be expected to be covered by you.

Confidentiality:

You need not to provide your name, surname or any personal identity on the questionnaire, to ensure that the information given by you remains confidential. The research reports and articles in journals will not include any information that will personally identify you. All information given by you will be strictly confidential.

Contact person in the event of any problems or Queries:

The Researcher: 079 571 0018

My supervisor: 082 842 6328

University Research Ethics Committee: 015 962 9058

Complaints can be reported to the Director: Research and Innovation

Prof G.E Ekosse: 015 962 8313

Or

Ivo.Ekosse@univen.ac.za

APPENDIX C: CONSENT FORM

Statement of Agreement to Participate in the Research Study:

- ✓ I hereby confirm that the researcher, (Tshiko Frank Matlala) has informed me about the nature, aim, conduct, benefits, and risks of this study - Research Ethics

Clearance Number:

- ✓ I have also received, read and understood the attached information letter regarding the study.
- ✓ I am aware that the results of the study, including personal details regarding my sex, age, area of residence and country of origin will be anonymously processed into a study report.
- ✓ I agree that the researcher can use the computerized system to process the data collected from me during the study.
- ✓ I know that I may withdraw my consent and participation in the study at any stage without notice.
- ✓ I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- ✓ I understand that significant new findings developed during this research that may relate to my participation will be made available to me.

Full Names of respondent	Date	Time	Signature

I, (Matlala T.F) herewith confirm that the above respondent has been fully informed about the nature, aim, conduct, benefits, and risks of the study.

Full Names of researcher	Date	Time	Signature
Full Names of witness (if applicable)	Date	Time	Signature

APPENDIX D: LETTER REQUESTING PERMISSION FROM STUDENT DIRECTOR

P.O Box 714

Ramokgopa

0811

29 May 2020

Student director

University of Venda

Private Bag X5050

Thohoyandou

0950

Dear Sir/ Madam

PERMISSION TO CONDUCT A STUDY

I, Tshiko Frank Matlala, a Master of Public Health student at the University of Venda, hereby request permission to conduct a study titled, "Knowledge, Attitude and Perception of university students regarding Medical Male Circumcision at university of Venda" using university of Venda campus students as my respondents. The aim of the study is to investigate the knowledge, attitudes, and perception of the University of Venda students regarding MMC.

The study might benefit the University of Venda students in terms of health improvement and access to MMC services. The University of Venda Clinic may acquire skills and be able to implement MMC programs.

I will be grateful if my request is granted

Yours Faithfully

Mr. Tshiko Frank Matlala

Master of Public Health student (Univen)

Student number: 17009285

NAME OF RESEARCHER/INVESTIGATOR:

Mr TF Matlala

STUDENT NO:

17009285

PROJECT TITLE: Knowledge, attitude and perception of university students regarding Medical Male Circumcision at the University of Venda, South Africa.

PROJECT NO: SHS/20/PH/26/0610

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Dr J Mabunda	University of Venda	Supervisor
Mr. TF Matlala	University of Venda	Investigator – Student

Type: **Masters Research**Risk: **Minimal risk to humans, animals or environment**Approval Period: **October 2020 – October 2022**

The Human and Clinical Trials Research Ethics Committee (HCTREC) hereby approves your project as indicated above.

General Conditions

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following.

- The project leader (principal investigator) must report in the prescribed format to the REC:
 - Annually (or as otherwise requested) on the progress of the project, and upon completion of the project
 - Within 48hrs in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
 - Annually a number of projects may be randomly selected for an external audit.
- The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the REC. Would there be deviated from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.
- The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date; a new application must be made to the REC and new approval received before or on the expiry date.
- In the interest of ethical responsibility, the REC retains the right to:
 - Request access to any information or data at any time during the course or after completion of the project,
 - To ask further questions; Seek additional information; Require further modification or monitor the conduct of your research or the informed consent process.
 - withdraw or postpone approval if:
 - Any unethical principles or practices of the project are revealed or suspected.
 - It becomes apparent that any relevant information was withheld from the REC or that information has been false or misrepresented.
 - The required annual report and reporting of adverse events was not done timely and accurately,
 - New institutional rules, national legislation or international conventions deem it necessary

ISSUED BY:

UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: August 2020

Name of the HCTREC Chairperson of the Committee: Prof MS Maputle

Signature:



UNIVERSITY OF VENDA OFFICE OF THE DIRECTOR RESEARCH AND INNOVATION 2020 - 10 - 09
Private Bag X5050 Thohoyandou 0950



APPENDIX E: PERMISSION FROM THE STUDENT WARDEN

RE: permission to collect data around UNIVEN residences



Lufuno LG. Tshikhudo <Lufuno.Tshikhudo@univen.ac.za>

2021/02/09 14:56



To: TSHIKO MATLALA Cc: Ntai Mokoena

Good day

Your request is approved, please liaise with Mr Mokoena, the Ho Dos Student Housing, whom I have also copied here for details.

Regards

LG Tshikhudo

From: TSHIKO MATLALA <matlalatshiko@yahoo.com>

Sent: Tuesday, February 9, 2021 1:31 PM

To: Lufuno LG. Tshikhudo <Lufuno.Tshikhudo@univen.ac.za>

Subject: FW: permission to collect data around UNIVEN residences

APPENDIX G: LANGUAGE EDITTING REPORT

Editing and Proofreading Report

24 April 2021

This letter serves to confirm that I, Mercy Precious Mujakachi of the English Department, University of Venda, have proofread and edited a Masters in Public Health titled *Knowledge, attitude and perception of university students regarding Medical Male Circumcision at the University of Venda, South Africa* by Tshiko Frank Matlala (Student No. 17009285).

I carefully read through this dissertation, focusing on proofreading and editorial issues. The recommended suggestions are clearly highlighted in red ink and can either be accepted or rejected using the Microsoft Word Track Changes System.

Yours Sincerely



Mercy P. Mujakachi: PhD candidate English Lit, MA (English), BA Honours
in English and Communication
English Department
University of Venda
Private Bag X5050
Thohoyandou 0950
South Africa
Tel.: +27 734681558
E-mail: mercymujakachi@gmail.com