Sustainability of Donor-Supported HIV Prevention Services: A Mixed Methods Study of the Ability and Willingness to Pay for Voluntary Medical Male Circumcision in Uganda

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This thesis is submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy. The candidate has already achieved 180 credits for the assessment of taught modules within the blended learning PhD programme.

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Dedication

"If we stand tall, it is because we stand on the shoulders of many ancestors," an African proverb.

This PhD research is dedicated to my late parents, Simon Bekiita and Martha Bekiita, who gave me the zeal and a solid foundation to pursue nothing but the best. I would not have reached this far without their support. How I wish they lived to see me reach this far.

It is also dedicated to my family: my wonderful wife, Racheal, and children Zoe, Jayson, and Zane, whom I deprived a lot of family time to complete this PhD.

Declarations

This thesis has not been submitted in support of an application for another degree at this or any other university. It is the result of my own work and includes nothing that is the outcome of work done in collaboration except where specifically indicated. Many of the ideas in this thesis were the product of discussions with my supervisors.

Supervisors

Professor Bruce Hollingsworth

and

Professor Mark Limmer

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Abstract

Title: Sustainability of Donor-Supported HIV Prevention Services: A Mixed Methods Study of the Ability and Willingness to Pay for Voluntary Medical Male Circumcision in Uganda

Uganda faces a generalised HIV epidemic, with about 1.2 million people living with HIV and AIDS. Uganda's HIV response is primarily donor funded, with 88% of funds from international donors. This PhD thesis focused on identifying potential alternative sources of funding for voluntary medical male circumcision (VMMC), which is one of the WHO-approved HIV prevention interventions. A systematic review of the willingness to pay (WTP) for HIV and AIDS in Africa was conducted as part of the thesis, and it revealed that there was an opportunity to fund the HIV response through out-of-pocket payments more sustainably. Informed by the systematic review, a mixed-methods, cross-sectional study was conducted with three objectives. The first was to determine the factors associated with the ability to pay (ATP) for VMMC, and it revealed that increasing age and having a university-level education are positively associated with the ability to pay while residing in a rural area and having high perceived behaviour control are negatively associated with the ATP for VMMC. The second objective was to determine the factors associated with WTP for VMMC. The findings revealed that 76% of the respondents were willing to pay for VMMC. The factors positively influencing WTP for VMMC are the ability to pay and belonging to the Muslim faith. Residing in a rural area, having no education and increasing perceived behaviour control are negatively associated with WTP for VMMC. The third and final objective was to identify the factors that inform WTP decisions. Twenty-nine qualitative interviews were completed, revealing mixed findings for and against paying for VMMC. This PhD contributes to the knowledge of willingness to pay for HIV services and documents key considerations for the successful introduction and implementation of fee-for-service VMMC. Further, the study improves the use of WTP methodology in health research. Overall policy implications are drawn in the Conclusions.

Acknowledgements

Many thanks to the people who have supported me along this PhD journey, including my academic mentor for the coursework phase of my studies, Professor Siobhan Reilly, my academic supervisors, Professor Hollingsworth Bruce and Professor Limmer Mark, and my former classmates with whom we shared many ups and downs. Finally, thanks also go to my examiners, Dr Andrew Harding of Lancaster University and Associate Professor Louise Jackson of the University of Birmingham.

"What counts in life is not the mere fact that we have lived. It is what difference we have made to the lives of others." Nelson Mandela

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List of Abbreviations and Acronyms

AIDS	Acquired immunodeficiency syndrome
ART	Antiretroviral therapy
ATP	Ability to pay
GFATM	The Global Fund to Fight AIDS, Tuberculosis and Malaria
FSW	Female sex worker
HIV	Human Immunodeficiency virus
HIVST	HIV self-testing
KFF	Kaiser Family Foundation
KNO	Knowledge
MSM	Men who have sex with men
PBC	Perceived behaviour control
PEPFAR	The U.S. President's emergency Plan for AIDS Relief
PLHIV	People living with HIV
PMTCT	Prevention of mother-to-child transmission of HIV
PrEP	Pre-exposure prophylaxis
SUBN	Subjective norms
TPB	Theory of planned behaviour
UGX	Uganda shillings

UNAIDS	The Joint United Nations Programme on HIV/AIDS
VMMC	Voluntary medical male circumcision
WHO	World Health Organisation
WTP	Willingness to pay

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1. INTRODUCTION

1.1. Introduction

The work presented in this PhD thesis describes the ability to pay (ATP) and willingness to pay (WTP) for voluntary medical male circumcision (VMMC) as options for sustainably providing VMMC in Uganda, independent of external donor support. The first chapter presents an introduction to the thesis and the research. Section 1.2 provides background information about the impact of HIV and AIDS globally, regionally and in Uganda. It also presents HIV prevention interventions that provide the context of the current study. The aim, objectives and research questions are presented in Section 1.3. The chapter ends by describing how the rest of the thesis is structured in Section 1.4.

1.2. Background and context

1.2.1. The burden of HIV and AIDS and its economic impact

Although there is renewed hope of ending HIV as a public health problem by 2030 (Harris, 2023), in the absence of an effective cure, HIV remains a significant threat to public health globally, and regional disparities persist. The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that, by the end of 2021, 38.4 million people were living with HIV globally. Cumulatively, it is estimated that 82.4 million people have been infected with HIV, and 40.1 million have died of AIDS since the start of the epidemic in the early 1980s (UNAIDS, 2022). Whereas the number of people dying of AIDS-related illnesses has fallen by 52%, from 1.2 million in 2010 to 650,000 deaths in 2021, new infections continue to occur (UNAIDS, 2022).

In 2021 alone, 1.5 million new infections occurred (UNAIDS, 2022). Africa carries a disproportionate burden and is the continent most affected by HIV and AIDS, accounting for two-thirds of all global HIV cases. At the end of 2021, it is estimated that 25.7 million people were living with HIV in Africa, and 870,000 of the 1.5 million new infections were registered in Africa (UNAIDS, 2022). Eastern and Southern Africa are the most affected regions, with 20.6 million people (55% of the cases) living with HIV (UNAIDS, 2022).

HIV and AIDS are huge burdens and have considerable opportunity costs, especially in low and middle-income countries (LMICs). Expenditure on HIV-related activities accounts for 20% of the total health budget in sub-Saharan Africa (Abah, 2020). To achieve the 2016 United Nations resolution of ending HIV and AIDS as a public health problem by 2030, low- and middle-income countries (LMIC) will require investments of up to US$29 billion (UNAIDS, 2021b) by 2025. In 2020 alone, to combat HIV and AIDS globally, US$26.2 billion was needed, but only US$18.6 billion was available. HIV-related care costs are estimated to reach US$40 billion annually by 2030 (Ismail et al., 2021).

Donations from high-income countries that are less affected by HIV remain a significant source of funding for HIV and AIDS activities in low- and middle-income countries (Dieleman et al., 2018; Olakunde et al., 2019). The United States of America (U.S.) leads the list of major bilateral donors for HIV- and AIDS-related activities. The U.S. (US$6.2 billion), the UK (US$646 million), France (US$287 million), the Netherlands (US$213 million) and Germany (US$180 million) were the major funders in 2019 (Kates et al., 2021). The Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), which contributes 30% of all funding for HIV and AIDS, had cumulatively invested about US$24.2 billion as of June 2022. Other donor sources include philanthropists, such as the Bill and Melinda Gates Foundation, and corporations such as Gilead Sciences, which

provide about 2% (US$465 million) of the HIV resources for LMICs (Kates et al., 2021). Although there has been an increase in domestic funding that currently accounts for 57% of the resources (UNAIDS, 2021a), the total resource envelope continues to decline. The U.S. government, through the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), has committed more than $100 billion to the global HIV and AIDS response, the most considerable sum ever given by a country to combat a single disease (Webster, 2023). This investment has saved more than 25 million lives, stopped millions from contracting HIV, and sped up the process of bringing the HIV and AIDS epidemic under control in more than 50 countries (Nkengasong et al., 2023; U. S Government, 2023). PEPFAR funding increased from inception in 2004 to 2009 and has since plateaued, mainly remaining the same despite a 25% increase in the number of people living with HIV and AIDS in low- and middle-income countries, as shown in Figure 1.1. The significant increase in 2021 was a particular response to the global coronavirus disease of 2019 (COVID-19) (KFF, 2023).

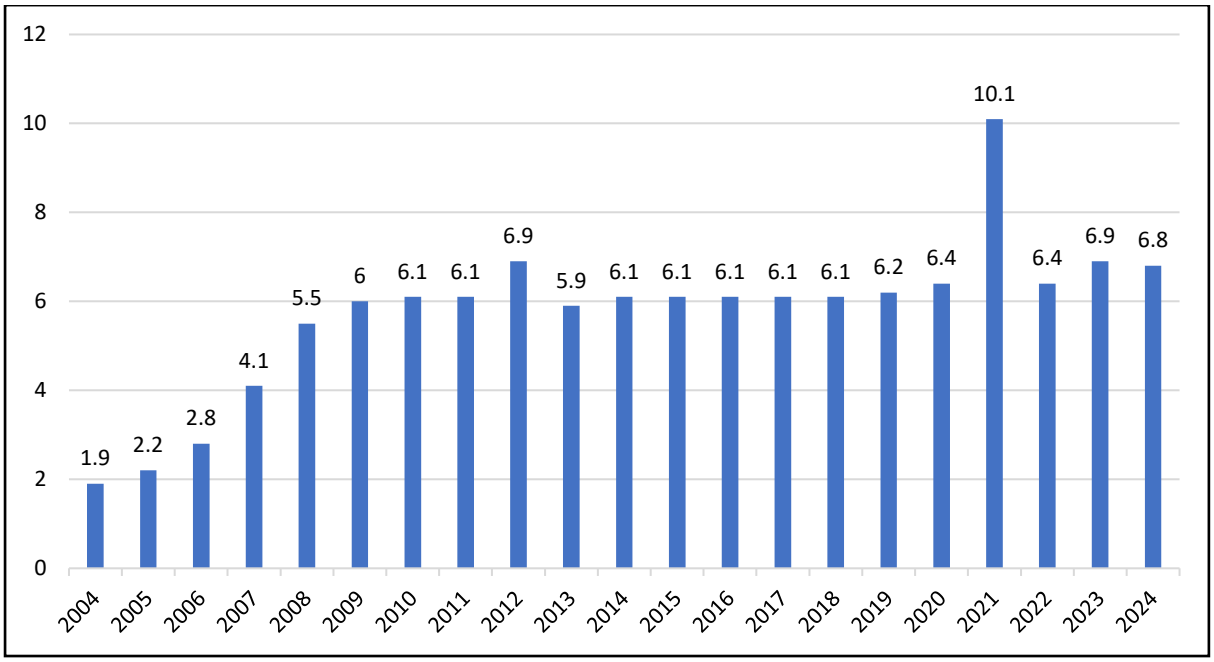

Figure 1.1 U.S. Funding for the President's Emergency Plan for AIDS Relief (PEPFAR), FY 2004–FY 2024 Request (In Billions) *Source: KFF 2023*

Atun et al. (2016) estimate that nine sub-Saharan African (SSA) countries will require US$261 billion between 2015 and 2050 to be able to provide antiretroviral therapy (ART) to all HIV-positive people, an obligation that is too substantial to be met through the current funding streams. Even if they adopt aggressive measures, such as debt cancellation, as Abah (2020) proposed, most HIV-affected, low-income SSA nations cannot generate sufficient public resources for HIV in the medium term (Remme et al., 2016). Notwithstanding the provision of antiretroviral therapy (ART) that prevents mortality, it is anticipated that long-term HIV survivors will develop chronic, HIV-related, non-communicable diseases, such as renal, cardiac and bone diseases (Freiberg et al., 2013). Whereas the provision of ART today is an absolute necessity and is needed to save lives, its long-term sustainability, more so for low-income countries such as Uganda, urgently calls for the prevention of new infections today (Ismail et al., 2021). Thus, there is a need to invest in cost-effective HIV prevention interventions to mitigate the substantial future financial needs for HIV treatment arising from antiretroviral therapy's survival benefits.

Uganda is one of the sub-Saharan African countries heavily affected by HIV and AIDS. Estimates show that of the 44.3 million people in Uganda in 2019, 1.5 million were living with HIV, of which 53,000 were newly acquired infections; 23,000 died of AIDS-related deaths that same year (Avert, 2021). HIV and AIDS continue to adversely impact economic growth in Uganda by affecting the supply of labour and productivity (Kabajulizi & Ncube, 2015), education, agriculture and household incomes (Kasirye & Hisali, 2010; Nabyonga-Orem et al., 2008). Although progress has been registered in efforts to fight HIV and AIDS in Uganda, mainly through the provision of ART, the achievements have not met the anticipated fast-track targets set by UNAIDS.

Uganda has made strides towards preventing HIV-related mortality by providing antiretroviral therapy. Over the past 10 years, a gradual improvement in the scale-up of ART has resulted in 85% of all known HIV-positive people in Uganda accessing ART, albeit short of the 95% target set by UNAIDS (Avert, 2021) by the end of 2020. The provision of lifelong ART is unsustainable if new HIV infections are not prevented because of the required resources. Nevertheless, the country's HIV response remains underfunded and heavily donor-reliant (UAC, 2015). Before the COVID-19 pandemic, the country was projected to experience a US$918 million budget shortfall in providing HIV-related care between 2021 and 2025. For the foreseeable future, until an HIV efficacious vaccine is found, commitment to provide ART remains a long-term unsustainable liability for governments (Haacker, 2011). Prevention of new HIV infections today is paramount for the sustainable management of HIV and AIDS in the future.

1.2.2. HIV prevention interventions

HIV prevention refers to interventions aimed at halting the transmission of HIV from an individual living with HIV to a person who is not HIV infected. UNAIDS classifies HIV prevention interventions into three broad categories: behavioural, structural and biomedical (UNAIDS, 2010). Behavioural interventions aim to reduce an individual's risk of acquiring HIV. They include HIV risk reduction counselling, cash transfer programmes for people who engage in economic activities that increase their risk of acquiring HIV, reduction of stigma and discrimination, and peer education. The structural interventions aim to address the underlying factors that make certain groups of people more vulnerable to HIV acquisition. Structural interventions include addressing inequalities, laws protecting the rights of HIV-positive people, increasing access to school education for young girls and preventing decriminalisation of sex work, homosexuality and drug abuse. Biomedical interventions use clinical and medical

approaches to reduce HIV transmission. They include voluntary medical male circumcision (VMMC), antiretroviral therapy (for treatment, prevention of mother-to-child transmission (PMTCT), pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP)), male and female condoms, HIV testing, needle exchange, blood screening, and sex and reproductive health services. Independently, they all have limitations that impact their effectiveness. The major limitation of all three HIV prevention interventions is that they primarily depend on the individual's goodwill to be aware of them, use them consistently and adhere to them as prescribed. In the absence of an effective HIV vaccine to prevent HIV transmission, the World Health Organisation (WHO) recommends the use of a combination of behavioural, structural and biomedical interventions to prevent HIV transmission (World Health Organisation (WHO), 2016). Voluntary medical male circumcision is part of this suite of interventions, although it is currently underutilised. Voluntary medical male circumcision is the only HIV prevention intervention available today that is a one-time intervention that offers lifelong protection from HIV acquisition and is relatively not reliant on the individual for its effectiveness (Gray et al., 2012). Therefore, such a cost-effective intervention must be harnessed and promoted.

1.2.3. Voluntary medical male circumcision

Voluntary medical male circumcision is a WHO-approved and effective biomedical HIV prevention intervention. VMMC prevents the transmission of HIV through unprotected sexual intercourse (without condoms) from a female person living with HIV to an HIV-uninfected male by up to 60% in a setting with a high HIV prevalence among the general population (Loevinsohn et al., 2021; Prodger & Kaul, 2017). Medical male circumcision reduces the risk of HIV infection in several ways. HIV infection in uncircumcised males primarily occurs through a break of the inner skin of the prepuce and of the skin over the glans penis, which are delicate and prone to

micro cuts during sexual intercourse (Galiwango et al., 2022). Uncircumcised males are also prone to other sexually transmitted infections, such as syphilis, gonorrhoea and herpes simplex, that cause wounds around the glans, which also act as a direct portal for the virus to gain access to the body (Barker et al., 2022; Looker et al., 2017). After circumcision, there is increased keratinisation (hardening) of the inner skin of the prepuce, making it less susceptible to micro cuts during intercourse and thus eliminating the direct portal of entry of HIV into the body. Further, the presence of broken skin alone is not sufficient to result in HIV infection. For HIV to enter the body, it must attach to CD4+ T cells and dendritic cells. The inner skin of the foreskin has a high concentration of CD4+ T cells and dendritic cells, which are reduced through the removal of the foreskin (circumcision) (Maric et al., 2021; Prodger et al., 2022).

A systematic review of the effectiveness of VMMC as an HIV prevention intervention confirmed the evidence first observed in 2007 (Farley et al., 2020). VMMC is a package of services that includes health education on HIV prevention, HIV risk-reduction counselling and testing, surgical removal of the foreskin, post-operative education and review 48 hours and seven days post-circumcision (WHO, 2018). The World Health Organisation and UNAIDS recommend VMMC as an HIV prevention intervention for countries such as Uganda, which have a high HIV prevalence and low male circumcision prevalence (WHO, 2007). Scaling up coverage for VMMC to 80% of males aged 15 to 49 years offers substantial individual- and population-level benefits, including HIV prevention, for both males and females (Emmanuel Njeuhmeli et al., 2011).

There is a relatively good demand for voluntary medical male circumcision in 14 priority countries. WHO estimates that between 2008 and 2017, 18.6 million circumcisions were conducted in priority countries, and by the end of 2017, about 4 million circumcisions were being conducted annually (Davis et al., 2018). The high demand for VMMC is partly due to

several demand-creation interventions. Three systematic reviews documented demand-creation interventions to improve the uptake of VMMC, although the evidence remains mixed. Ensor et al. (2019) found that financial incentives and health education significantly improved VMMC uptake. Carrasco et al. (2019) and Kennedy et al. (2020) found no strong evidence consistently supporting financial incentives to improve demand for VMMC. In both reviews, economic incentives were only effective in Kenya and Tanzania, which have almost reached the saturation of VMMC, and the findings may not be generalisable to countries with a low prevalence of male circumcisions, such as Uganda. Carrasco et al. (2019) and Kennedy et al. (2020) point out ethical considerations associated with financial incentives and the possibility of failure to sustain them when donor funding ceases. Additionally, systematic reviews have found that economic hardships only affect the demand for VMMC after a certain saturation threshold (Carrasco et al., 2019). There is an opportunity for countries such as Uganda, which has a low prevalence of male circumcision, to improve coverage (Nanteza et al., 2018).

Although there is evidence to show that financial barriers impede the uptake of male circumcision, it remains inconclusive, and most of it comes from high-income countries where HIV is not a significant health problem. Hart-Cooper et al. (2014) explored the circumcision of privately insured people aged 0 to 18 years in the United States and reported increased uptake, where male circumcision is funded through insurance but only among neonates and non-adults. Clark et al. (2011) report that coverage of male circumcision was low in states with Medicaid (public health insurance) cover for adult circumcision because circumcision was not covered by insurance. Thornton and Godlonton (2016) found that reducing the cost of circumcision amongst urban males in Malawi increased the uptake of VMMC, depending on the HIV risk profile of the individual, with higher uptake among those most at risk of HIV. All

three studies found that removing financial barriers improved the uptake of VMMC, but they did not report on the ability or willingness of people to pay for the service. These studies affirm the importance of reviewing the ability and willingness to pay for VMMC. The cost of elective circumcision in the USA is prohibitive, ranging from US$2,096 to US$3,544 (Many, 2020), which may exclude a number of individuals. The findings from the studies in the USA may not be generalisable to low-middle-income countries, where the cost of male circumcision ranges from US$22 in Uganda to US$135 in South Africa (Bautista-Arredondo et al., 2021). Hence, a new study is needed to determine whether financial barriers are important in this context.

Voluntary medical male circumcision is a cost-effective HIV prevention intervention, but it is underutilised. Previously, the World Health Organisation estimated that circumcising 80% of males aged 15 to 49 years in priority countries by 2025 would avert 6 million new infections and 3 million AIDS-related deaths, saving US$16.5 billion worth of HIV care and treatment-related costs (Davis et al., 2018; E. Njeuhmeli et al., 2011). Despite low coverage, VMMC is the most cost-effective HIV prevention intervention (Haacker et al., 2016; Tobian et al., 2014). A systematic review of the cost-effectiveness of VMMC as an HIV prevention intervention found that 520,000 HIV infections were averted by the end of 2018 from the 22.7 million circumcisions performed in 15 priority countries (Farley et al., 2020). A recent systematic study found that, despite the high antiretroviral therapy coverage, VMMC remained the most cost-effective and cost-saving intervention for preventing HIV (Bansi-Matharu et al., 2023). Evidence at the national level from two countries, the *HIV investment case for South Africa* (Meyer-Rath et al., 2017) and the nationwide *Study for optimisation of HIV prevention and treatment in Eswatini* (Minnery et al., 2020), affirm the cost-effectiveness of VMMC as an HIV prevention intervention. A policy simulation study in Uganda found that circumcising 60% of

males aged 15–49 would have averted 121,278 new HIV infections by 2020 and offer a net savings of US$6,515 per HIV infection averted (Ahaibwe & Kasirye, 2013). Despite its cost-effectiveness, several countries, including Uganda, have not fully exploited the benefits of VMMC. Most of the 14 VMMC priority countries have not yet met their VMMC targets (UNAIDS/WHO, 2021).

Uganda, with a high prevalence of HIV in the general population and a low prevalence of male circumcision, is a priority country for VMMC that has unfortunately not achieved UNAIDS fast-track targets. Having endorsed VMMC (termed safe male circumcision [SMC] in Uganda) as part of the combined HIV prevention interventions in 2010, Uganda targeted to circumcise 4.2 million (80%) men aged 15 to 49 years between 2010 and 2015, a target that was not achieved (Kong et al., 2017).

To increase the provision of VMMC with minimal disruption of other clinical services, Uganda adopted "Models for Optimizing the Volume and Efficiency", a model developed by a panel of WHO VMMC experts as part of the considerations for improving efficiency while ensuring safety, given the local context and national policy (WHO, 2010b). In Uganda, mobile surgical tents (often called camps) offer VMMC services at health facilities with space constraints, reach remote communities, and maximise the outputs from health workers. The camps involve mobilising several clients who are given appointments to receive VMMC on a specific day. On the day of the service, several healthcare workers are available to provide VMMC to the many people who have turned up using tents that act as clinical rooms. Typically, several surgical beds are set up under one big tent. The camps run for about five days before shifting to a new location. A few healthcare workers stay behind to attend to the people who return for reviews

within 48 hours of circumcision. Circumcised individuals are also given information on where to seek any assistance after the camps have closed (Seruwagi et al., 2021).

The reasons for Uganda's failure to meet targets include negative misconceptions about VMMC, fear of adverse events and lack of adequate resources to offer the service (Nanteza et al., 2020; Nanteza et al., 2018). If, eventually, the 80% male circumcision prevalence amongst men in Uganda is attained, the country will need to conduct 450,000 circumcisions annually to maintain 80% saturation (K. Kripke et al., 2016). Substantial financial resources would be required to bring the country on course to address the backlog and maintain an 80% prevalence of male circumcision.

1.2.4. Payment for male circumcision

Globally, evidence of the ability and willingness to pay for VMMC remains scant. From the literature search, most evidence documents the unit costing of VMMC (Bautista-Arredondo et al., 2021; Pineda-Antunez et al., 2019), the cost-effectiveness of VMMC (Galárraga et al., 2018; Haacker et al., 2016), creating demand for VMMC (Carrasco et al., 2019; Nanteza et al., 2020), and options for scaling up VMMC to the private sector (Tchuenche et al., 2018). However, to date, only one study has documented the ability and willingness to pay for VMMC. The evidence from this single study leaves gaps that need to be addressed.

Wandei et al. (2016) conducted a cross-sectional quantitative survey of 384 household heads in Kenya to determine their ability and willingness to pay for VMMC. Whereas the ability to pay is best addressed at the household level (Russell, 1996, 2005), for a service such as VMMC, primarily for adult males, the willingness to pay for it may go beyond the household's ability to pay for it. Circumcision amongst adults (as is done for HIV prevention) is a private matter that

is better assessed at the individual level than at the household level (Adams et al., 2022). Russell (1996) notes that the ability to pay may not always translate into willingness to pay. The survey in Kenya found that, whereas 62% of the surveyed household heads could pay for VMMC, only 40% were willing to pay for it. The reasons that informed the willingness-to-pay decisions of the household heads were not documented, yet they may be crucial. Spash et al. (2009) contend that it is vital to consider the psychosocial and motivational factors that underlie contingent valuation responses and demographic characteristics. Whether the high proportion of female respondents (62%) who are not direct beneficiaries of VMMC affected the findings in the Wandei Study is unknown and needs to be explored. The study in Kenya has two main methodological gaps: population and the absence of qualitative information that informs household WTP decisions. Therefore, a new study is needed to address the methodological gaps in Wandei's work.

The second study from the literature search assessed the out-of-pocket costs of accessing VMMC in South Africa (Tchuenche, Palmer, et al., 2016). A cross-sectional, quantitative survey conducted in South Africa assessed three kinds of expenses incurred by VMMC clients to receive VMMC. The study population included 190 individuals who had already received VMMC and were caregivers for minors who could not directly participate. The participants were asked to report the direct medical expenses, the direct non-medical fees, such as transport for clinic visits and meals, and the indirect expenses, such as lost income and the costs of childcare while attending VMMC-related clinics. The study reports that transport ($9.2) and lost days of work as factors that affect demand for VMMC. The survey had several limitations acknowledged by the authors that should be addressed in subsequent studies. First, the sample size of 190 was small, which can lead to bias. Like the survey in Kenya, it also had

caregivers for minors as part of the respondents, who may not find much utility in circumcision or have all the required information about the factors that affect demand for VMMC. Second, the survey was among individuals who had already received VMMC. Thus, it did not capture information on individuals who wanted VMMC but could not afford it because of the out-of-pocket costs associated with seeking the service. Lastly, there is no documentation showing who met the expenses. Thus, it is difficult to determine whether the surveyed individuals had the ability and willingness to pay for the out-of-pocket costs of VMMC. The limitations of this survey call for a new study that addresses these gaps to better inform HIV prevention through VMMC.

1.2.5. Funding for HIV and AIDS, and health services in Uganda

HIV prevention, care and treatment in Uganda remain primarily donor-driven. Donors contribute as much as 85% of Uganda's HIV funding (Kakaire et al., 2016). As shown in Figure 1.2, international resources accounted for 88% of all resources for HIV prevention in Uganda in 2019. Between 2004 and 2020, the U.S. government alone invested up to US$3 billion in HIV and AIDS programming in Uganda (PEPFAR, 2021). How long such support can continue is unknown, and stagnation and sometimes a decline in PEPFAR's investment in HIV globally have been observed. Between 2015 and 2017, a decrease of 18% was observed (Kates et al., 2017). Not only does such a decline threaten to roll back the country's successful HIV response (Green et al., 2006), but it also places the country's economic growth out of its control.

The public health sector in Uganda continues to experience underfunding and reductions in public spending on health (Orem & Zikusooka, 2010). Between 2010 and 2019, the allocation to health as a percentage of gross domestic product (GDP) was reduced from 6.81% to 3.77%

in the national budget, as indicated in Figure 1.3 (UNAIDS, 2023). Individuals can and have been able to contribute significantly to healthcare funding. Out-of-pocket payments, mainly towards purchasing curative services, account for 49% of Uganda's health funding (WHO, 2015). Out-of-pocket payment remains an option to be explored for services such as VMMC, despite the global push for universal health coverage.

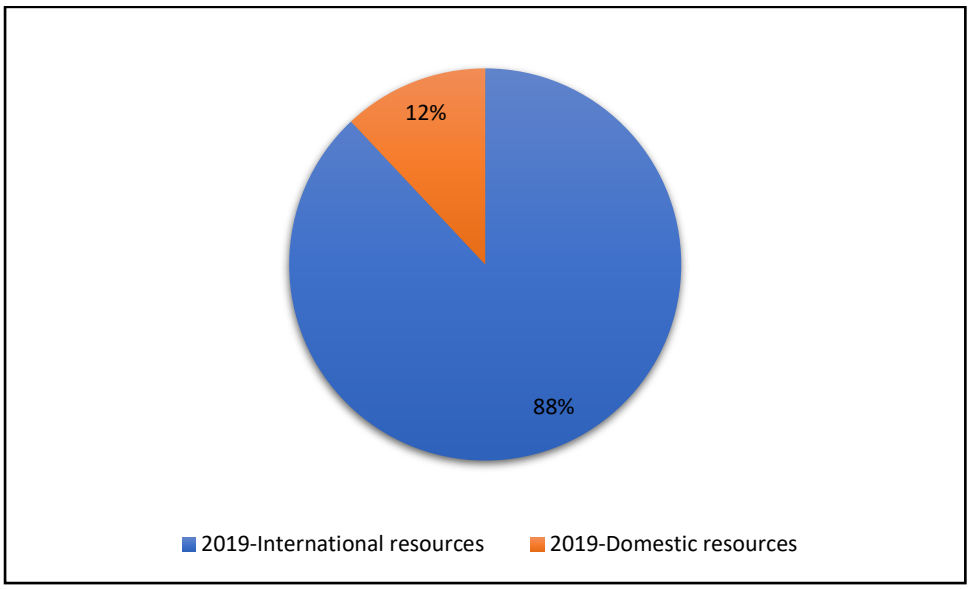

*Figure 1.2 Uganda's reported HIV expenditure by financing source (*Source: UNAIDS 2023)

In Uganda, voluntary medical circumcision is a relatively cheaper service to offer compared to other countries. The one-off cost of conducting one male circumcision in Uganda ranges from US$22.65 to US$34 (Bautista-Arredondo et al., 2021; Duffy et al., 2013; Larson et al., 2015). The average cost of providing ART in Uganda is US$165 per capita (Guthrie et al., 2020). A fee of US$22 to US$34 per procedure is reasonable for some segments of society. The out-of-pocket expenditure on health in Uganda ranges from US$6.82 for the poorest to US$498.85 for the richest per capita (Koseki et al., 2015). Whereas it is not envisioned that every adult male in Uganda can afford to pay for a VMMC, understanding the ability and willingness of the population to pay for VMMC enables health policymakers and planners to redirect public

resources to the poorest segments of the community. There is relatively high acceptability and good safety for VMMC in Uganda. Albert et al. (2011) and Kitara et al. (2013) describe VMMC as being very acceptable, while Byabagambi et al. (2015) described the interventions implemented to assure the quality of the programme. It remains unknown whether such demand and service quality would be sustained if the service were paid for. Wilhelm et al. (2019) found a decline in access to, and quality of HIV care services in Uganda following the transition of health units out of PEPFAR support. Sustaining VMMC services independent of donor support may call for consumer cost recovery and thus requires further exploration.

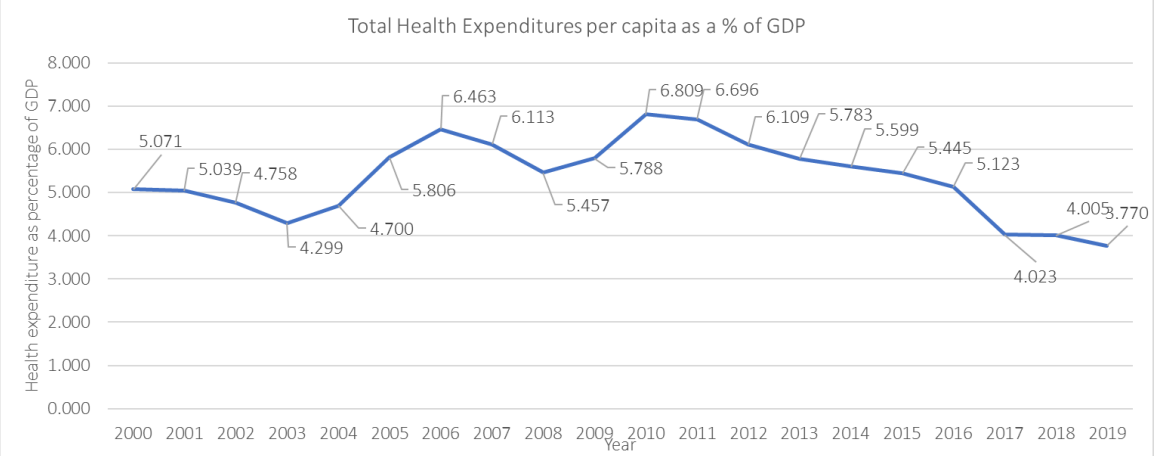

Figure 1.3 Health expenditure as a percentage of gross domestic product (GDP), 2010–2019; Source: UNAIDS 2023 (WHO Health expenditure database, IMF economic outlook 2022, extracted June 2022)

1.3. Research aim, objectives and research questions

1.3.1. Aim

This PhD thesis aims to determine the ability and willingness to pay for voluntary medical male circumcision to sustain male circumcision for HIV prevention in Uganda. Njeuhmeli et al. (2016) recommend that priority VMMC countries should develop plans to sustain the provision of

VMMC. With decreasing donor support (Kates et al., 2021) and HIV- and AIDS-related services taking up 20% of public health resources (Amico et al., 2010), this study aimed to explore whether there was an ability and willingness to pay for VMMC using out-of-pocket resources as an option for sustaining the service beyond donor resources. By determining the factors associated with a willingness to pay, the current study would contribute to describing subpopulations targeted with out-of-pocket funded VMMC and thus reserve public resources for individuals unable to contribute. Therefore, the envisioned end use of the findings of this study was to provide helpful information to support considerations for the introduction of fee-for-service VMMC to segments of the community that are able and willing to pay for it.

1.3.2. Objectives

The specific objectives of this PhD thesis are as follows:

1. To identify the factors determining the ability to pay for voluntary medical male circumcision in Uganda.

2. To determine the factors associated with a willingness to pay for voluntary medical male circumcision services in Uganda.

3. To determine the reasons that inform willingness to pay or not to pay for VMMC services in Uganda.

1.3.3. Research questions

This PhD thesis aims to answer the following research questions:

1. What factors determine the ability to pay for voluntary medical male circumcision in Uganda?

2. What factors are associated with willingness to pay for voluntary medical male circumcision in Uganda?

3. What are the reasons that inform the decision to pay or not to pay for voluntary male circumcision in Uganda?

1.4. Thesis outline

This PhD thesis is organised into eight chapters. Chapter 1 presented the introduction and background of the research. Chapter 2 presents the literature on willingness to pay for HIV services in Africa, including VMMC. This chapter presents what is already known from previous willingness-to-pay-for-HIV-service studies and highlights the gaps that should be addressed. Chapter 3 presents the research paradigm in which the researcher's philosophical stance, including the theories underpinning the study, is discussed and informs the methodology undertaken in the study. Chapter 4 covers the quantitative and qualitative methods used to answer the research questions. The quantitative and qualitative findings are presented in Chapters 5 and 6, respectively. Chapter 7 of the thesis discusses the findings and locates them within the broader body of knowledge. The final chapter, 8, contains this PhD thesis's conclusions and major recommendations.

2. SYSTEMATIC LITERATURE REVIEW

2.1. Introduction

Chapter 2 presents a systematic literature review of the willingness to pay for HIV services in Africa. The review was a preliminary step towards an empirical study on the ability and willingness to pay for VMMC, one of the HIV prevention services. The review aimed to determine the extent of willingness to pay for HIV and AIDS services, find out the methods used in WTP studies for HIV and AIDS studies and identify any gaps in knowledge that the empirical research on WTP for VMMC study may address. In the current review, the term "HIV and AIDS services" is operationally defined as WHO-approved services for i) diagnosis of HIV, e.g., payment for HIV self-test kit, ii) prevention of HIV, such as the use of pre-exposure prophylaxis, and iii) improving care and clinical outcomes of people living with HIV, such as antiretroviral therapy. The chapter starts with the methodology used to identify the literature and then presents the findings from the search process. The chapter ends with a summary of the results from the literature review. Part of the work presented in this chapter is available through a peer-reviewed publication (Byabagambi et al., 2023).

2.2. A systematic review of the willingness to pay for HIV and AIDS services in Africa

2.2.1. Initial scoping search for literature

A preliminary scoping search was conducted to identify the extent and type of literature available on the ability and willingness to pay for male circumcision. Scoping searches provide broad information on the scope of literature on a topic, identify if a systematic review has

already been done on the same topic and give an idea of the search terms (Rathbone et al., 2017). Rathbone et al. (2017) state that a scoping search is not necessarily aimed at producing a summary answer to a given question, which aligns with the reasons for the preliminary scoping search.

A multistage scoping search was conducted, as presented in Table 1, to determine the extent of the literature on the ability and willingness to pay for VMMC. The scoping search revealed minimal literature. The search was widened to HIV services, and the findings revealed minimal literature on the ability to pay, with almost all of it being about willingness to pay.

A scoping search about the willingness to pay for male circumcision was conducted using Google Scholar and Lancaster University's OneSearch engine. Google Scholar returned 5,130 records, while OneSearch returned 16,595. Only two relevant articles about the willingness to pay for male circumcision were found among the records returned from the subject headings. Most of the literature is about the effectiveness of male circumcision as an HIV prevention intervention. Another scoping search, which was widened to focus on willingness to pay for HIV and AIDS services, was conducted. More than five million records were returned, and relevant records on WTP were identified from the search results.

Among the records returned were two systematic reviews. The first elicited preferences for HIV prevention services (Beckham et al., 2021). An analysis of Beckham et al. (2021) systematic review revealed that it focused on determining the preferences for various HIV prevention technologies and the preference elicitation methods used in the studies. The review leaves a gap in understanding the willingness to pay for HIV and AIDS services to sustainably fund HIV interventions, specifically in Africa, where HIV is the most prevalent. The second review by Humphrey et al. (2019) only focused on studies that used discrete choice experiments, conjoint

analysis and best–worst scaling approaches to determine preferences for HIV services. Like the review by Beckham et al., the second review does not contribute to understanding the willingness to pay for HIV services in Africa. Based on the knowledge gaps from the available reviews, a new systematic review focused on the willingness to pay for HIV and AIDS services as an alternative option to HIV funding was required. The next step was to conduct a systematic literature review of the willingness to pay for HIV and AIDS services in Africa, as described in Sections 2.2.2 to 2.2.15.

Table 2.1 Multistage scoping searching for literature

Stage	Scoping search topic	Findings	Decision/Comment
1.	Ability and willingness to pay for VMMC	Two relevant articles	Narrow down and search the ability to pay separately from the willingness to pay
2.	Ability to pay for VMMC	One relevant article similar to the one identified in Stage 1	
3.	Willingness to pay for VMMC	Two relevant articles	Widen search from VMMC to HIV services
4.	Ability and willingness to pay for HIV services	Several articles returned	All about willingness to pay, except for one article similar to the one identified in Stage 1
5.	Ability to pay for HIV services	Several articles returned	All about willingness to pay, except for one article similar to the one identified in Stage 1
6.	Willingness to pay for HIV services	Several articles returned	Conduct a systematic review on willingness to pay for HIV services

2.2.2. Systematic review approach

A Cochrane Guidelines review approach informed the methods used to conduct the systematic review to ensure the process was auditable and reproducible (Higgins, 2011). The intention

was to conduct a meta-analysis if possible. However, based on the retrieved data, a narrative synthesis was found to be the most appropriate and was thus used, aligning with the philosophical stance of pragmatism that allows flexibility in the methodology. The Cochrane approach includes having a clearly stated review question, pre-defined eligibility criteria for studies, explicit, reproducible methodology, systematic search for literature, assessment of the validity of included studies and systematic synthesis of data to conduct a statistical reanalysis of the data if they are available (Higgins, 2011). A systematic review protocol was developed and submitted to the Centre for Reviews and Dissemination (PROSPERO) register, registered as CRD42021275215. The systematic review sought to answer the following questions:

1. What is the extent of the willingness to pay for HIV and AIDS services?
2. What methods are used to investigate the willingness to pay for HIV and AIDS services?
3. What HIV and AIDS services have been investigated using the willingness-to-pay approach?
4. What factors influence the willingness to pay for HIV and AIDS services?

The primary objective of this review was to determine the extent of the WTP for HIV and AIDS services. The secondary objectives included determining the methods used to investigate the WTP for HIV and AIDS services, the types of HIV and AIDS services that have been investigated using the WTP and the factors that influence the WTP for HIV and AIDS services in Africa.

2.2.3. Inclusion and exclusion criteria

To be included in the review, the studies met the following criteria: 1) articles about WTP, 2) HIV and AIDS services, 3) conducted in Africa, and 4) in English. The exclusion criteria were 1)

studies that used preference elicitation methods other than WTP, 2) studies that were not about HIV and services, and 3) studies about tuberculosis among people living with HIV. Studies were excluded if an HIV and AIDS service was not the main topic under study. Such articles included studies that described caregivers' experiences with people living with HIV. The review was restricted to Africa for two reasons. First, Africa is the most affected continent and depends more on HIV donor resources (UNAIDS, 2022). Second, income and socio-economic status are documented to influence WTP (Steigenberger et al., 2022a); thus, the inclusion of high-income countries in Europe and North America can skew the findings, a limitation noted in other systematic reviews. No date limiter was used to search articles because the preliminary scoping search did not reveal many records relevant to the review questions. VMMC is a relatively new HIV prevention intervention endorsed by WHO in 2007. Therefore, it would be unwise to use date limitation. Secondly, the preliminary scoping review did not identify any relevant preview systematic review. Thus, it was thought to be beneficial to include all articles that were available at the time the search was conducted.

2.2.4. The search of electronic databases for literature

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach was used to guide the reporting of findings (Liberati et al., 2009). The search terms retrieved from relevant articles identified in the scoping search were used to search the electronic databases shown in Appendix A.

An electronic search was conducted in PubMed, EMBASE, Web of Science, and CINAHL, accessed through Lancaster University Library, using the search terms shown in Appendix A. The databases were selected because the articles identified during the preliminary scoping

search were indexed by these databases. The total number of records returned from all the databases was 5,110. A manual search in references to relevant published articles and on the websites of the International AIDS Society (IAS), Avert and the World Health Organisation (WHO) was conducted for additional articles and grey literature. In total, the other sources yielded an additional 31 records. The final number of records available for review was 5,141. The number of records was reduced to 107 articles after screening for the key terms in subject headings/titles and abstracts. Of the 107 articles available for review, 84 were excluded for various reasons: 38 articles were not about willingness-to-pay studies but used other preference elicitation methods such as willingness to accept, 32 were duplicates, not about WHO HIV service (Chiwaula et al., 2016; Naggirinya et al., 2022), and 8 were about willingness to participate in studies (Mayanja et al., 2020; Meque et al., 2014). Other reasons for dropping articles were study protocol (Subramanian et al., 2018), not about an HIV service, digest article for one of those already included (London, 2016), viewpoint (Binswanger, 2003), and letter to the editor about an article already included (Adepoju et al., 2023). Twenty-three articles were available for data extraction. The articles were exported to EndNote 20 (The EndNote Team, 2013) to ease detailed review and data extraction. Figure 2.1 shows the PRISMA flow diagram summarising the literature search and the screening of documents.

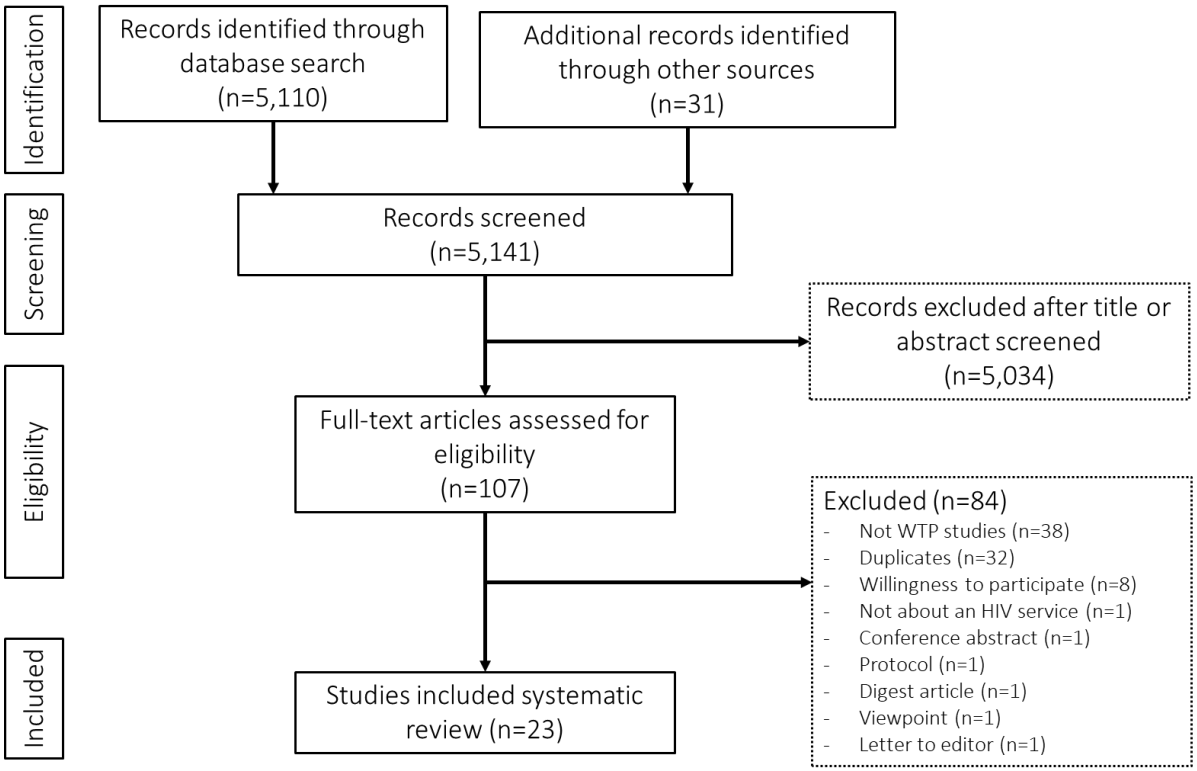

Figure 2.1 PRISMA flow diagram

2.2.5. Critical appraisal

Critical appraisal is a structured process used to understand a study's strengths and weaknesses (Duffy, 2005). The critical appraisal tool depends on the evidence to be appraised (Buccheri & Sharifi, 2017). Before data extraction, the 23 articles identified for inclusion in the final review were critically appraised to determine their quality. The data quality assessment for the quantitative articles was conducted using the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies (Joanna Briggs Institute, 2017a). The qualitative paper was assessed using the JBI Critical Appraisal Checklist for Qualitative Research (Joanna Briggs Institute, 2017b), as these tools are particularly recommended for cross-sectional studies (Ma et al., 2020) and are easy to apply and interpret by non-experienced systematic reviewers (Buccheri & Sharifi, 2017). The quantitative articles were assessed for 1) the presence of clearly defined criteria for inclusion in the sample, 2) a description in detail of the study subjects and

the setting, 3) valid and reliable measurement of the exposure, 4) objective and standard criteria used for measurement of the condition and 5) appropriate statistical analysis. The qualitative paper was assessed for 1) congruity between philosophy and methodology, 2) congruity between methodology and methods, 3) influence of the researcher on research and vice versa, 4) representation of the respondent's voice and 5) ethical approval. All items on the JBI tools that were not applicable to the retrieved studies were not used in the quality assessment. The retrieved articles were scored as "Yes", "No" or "Unclear." Items that scored "Yes" were assigned one point, while articles that scored "No" were assigned a score of zero. The "Unclear" items were not scored. The total maximum score was five. Articles that scored 4–5 were ranked as high quality, 2–3 as medium quality and 0–1 as low quality. All articles that were scored as medium to high quality were included in the final review. The scoring system was adapted from other studies (Mansoor & Khuwaja, 2020; Rossi-Fedele et al., 2019). The detailed quality assessment is shown in Appendix B.

2.2.6. Data extraction

A standardised data extraction template (Appendix C) was used to capture data about the following items: 1) authors and year of publication, 2) country of the study, 3) HIV service area, 4) objective of the study, 5) study population, 6) sample size, 7) survey method, 8) WTP elicitation method, 9) type of statistical analysis conducted and 10) factors associated with the WTP.

2.2.7. Synthesis and analysis

A descriptive narrative synthesis (Popay et al., 2006) was used to synthesise the findings for two main reasons. First, the British National Health Services Centre recommends it for reviews

and dissemination as the first level of synthesis that informs the appropriate type of synthesis based on the available articles (Khan et al., 2001). Second, the articles available for synthesis were heterogeneous. The authors surveyed different interventions, used different study populations and used different methods. Thus, a meta-analysis that would have been ideal for such an economic evaluation review could not be conducted for this review (Willis & Quigley, 2011). Data on the authors, country of the study, HIV service area, the objective of the study, population, sample size, survey method, WTP elicitation method, type of statistical analysis conducted and factors associated with WTP were synthesised. The synthesised data were summarised in tables stating frequencies across the methods and HIV service areas. The factors associated with WTP and the frequency with which they were mentioned in the articles were identified.

2.2.8. Summary of included literature resources

The articles were published between 2002 and 2022, with the majority (13, 56.5%) published between 2016 and 2020, as shown in Figure 2.2. The studies were conducted in 10 African countries, including Nigeria, which had 10 (Adekunjo et al., 2020; Dim et al., 2015; Durosinmi-Etti et al., 2022; Durosinmi-Etti et al., 2022b; Evans et al., 2019; Isah et al., 2019; Isah et al., 2021; Mbachu et al., 2018; Nwobi et al., 2017; Uzochukwu et al., 2011); Kenya, which had six (Begnel et al., 2020; Evans et al., 2019; Forsythe et al., 2002; Otiso, 2016; Thirumurthy et al., 2018; Wandei et al., 2016); Tanzania (Ashburn et al., 2020; Chiu et al., 2021; Geldsetzer et al., 2020) and Zimbabwe (Chirundu et al., 2017; Evans et al., 2019; Evans et al., 2011), which each had three and one article from Zambia (Evans et al., 2019), Uganda (Twimukye et al., 2017), Cote d'Ivoire (Ashburn et al., 2020), South Africa (Evans et al., 2019), Cameron (Muko et al.,

2004) and Ghana (Ayifah & Ayifah, 2012). Two studies were conducted in multiple countries (Ashburn et al., 2020; Evans et al., 2019).

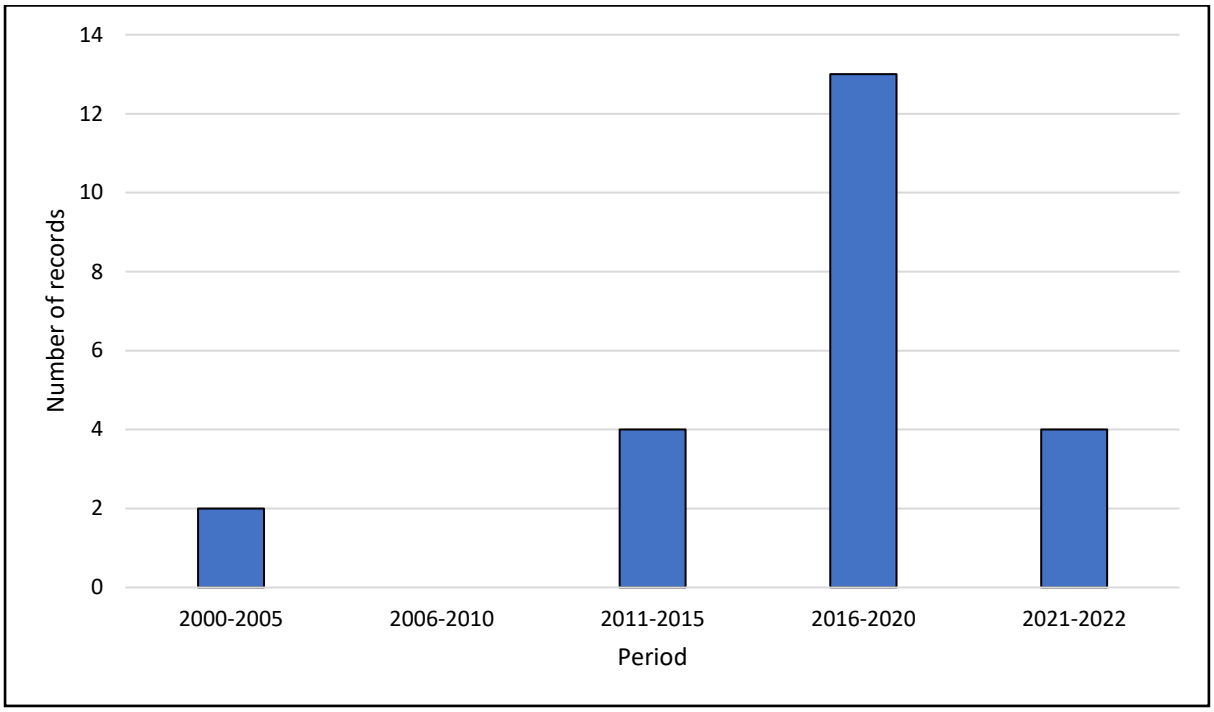

Figure 2.2 Frequency of willingness-to pay-records extracted from literature for the period 2000–2022

2.2.9. The scope of HIV and AIDS services

Table 2.1 presents the themes and types of HIV services investigated using the WTP approach in Africa. Among the articles retrieved and eligible, 30.4% (7/23) covered the theme of HIV diagnosis (Adekunjo et al., 2020; Ashburn et al., 2020; Chiu et al., 2021; Durosinmi-Etti et al., 2022b; Forsythe et al., 2002; Thirumurthy et al., 2018; Uzochukwu et al., 2011), 39.1% (9/23) the theme of HIV prevention (Ayifah & Ayifah, 2012; Begnel et al., 2020; Dim et al., 2015; Durosinmi-Etti et al., 2022b; Evans et al., 2019; Evans et al., 2011; Isah et al., 2019; Isah et al., 2021; Wandei et al., 2016), and 34.9% (8/23) the theme of HIV care and treatment (Chirundu

et al., 2017; Durosinmi-Etti et al., 2022; Geldsetzer et al., 2020; Mbachu et al., 2018; Muko et al., 2004; Nwobi et al., 2017; Otiso, 2016; Twimukye et al., 2017). Regarding HIV diagnosis, the articles were evenly distributed between WTP for HIV counselling and testing (HCT) and HIV test kits, with one article discussing HIV self-testing. There is an uneven distribution across the types of services under the themes of HIV prevention and HIV treatment. Under HIV prevention, 33.3% (3/9) of the articles are about the prevention of mother-to-child transmission of HIV (PMTCT) (Ayifah & Ayifah, 2012; Isah et al., 2019; Isah et al., 2021), 33.3% (3/9) are about WTP for condoms (Durosinmi-Etti et al., 2022b; Evans et al., 2019; Evans et al., 2011), 22.2% (2/9) on PrEP (Begnel et al., 2020; Durosinmi-Etti et al., 2022b) and one article each for voluntary medical male circumcision (Wandei et al., 2016) and cervical cancer screening (Dim et al., 2015). Seven articles (87.5%) on the treatment theme were about ART, while one was about general HIV care services (Otiso, 2016).

Table 2.2 Country and scope of HIV technical area covered in the literature

Country	HIV theme			Article
	Diagnosis N = 7	Prevention N = 9	Treatment N = 8	
	Type of HIV services			
Nigeria	HCT			(Uzochukwu et al., 2011)
Nigeria	HCT			(Adekunjo et al., 2020)
Kenya, Nigeria, South Africa, Zambia and Zimbabwe		Condoms		(Evans et al., 2019)
Cameron			ART	(Muko et al., 2004)
Kenya	HCT			(Forsythe et al., 2002)
Nigeria		Cervical cancer screening		(Dim et al., 2015)
Tanzania			ART	(Geldsetzer et al., 2020)
Nigeria			ART	(Mbachu et al., 2018)
Zimbabwe		Condoms		(Evans et al., 2011)
Kenya	HIV test kits			(Thirumurthy et al., 2018)
Kenya		PrEP		(Begnel et al., 2020)
Tanzania	HIV test kits			(Chiu et al., 2021)
Cote d'Ivoire and Tanzania	HIV test kits			(Ashburn et al., 2020)
Zimbabwe			ART	(Chirundu et al., 2017)
Ghana		PMTCT		(Ayifah & Ayifah, 2012)
Uganda			After-hours ART clinic	(Twimukye et al., 2017)
Kenya		VMMC		(Wandei et al., 2016)
Nigeria		PMTCT		(Isah et al., 2019)
Nigeria			ART	(Nwobi et al., 2017)
Nigeria		PMTCT		(Isah et al., 2021)
Nigeria	HIVST	Condoms, PrEP		(Durosinmi-Etti et al., 2022b)
Kenya			ART	(Otiso, 2016)
Nigeria			ART	(Durosinmi-Etti et al., 2022)

2.2.10. Willingness to pay for HIV services in Africa

Table 2.2 shows the percentage of people willing to pay for HIV services. All 23 articles that were reviewed found that people were willing to contribute towards the payment of HIV services but to varying levels. From the 22 quantitative studies that reported on the percentage of people who are willing to pay, the proportion of people willing to pay for various HIV services ranged from 34.3% for payment of ART in Nigeria (Mbachu et al., 2018) to 97.1% for payment of PMTCT services still in Nigeria (Isah et al., 2019). Only two studies (Mbachu et al., 2018; Wandei et al., 2016) had fewer than 50% of the people willing to pay for services.

Table 2.3 Percentage of the willingness to pay for HIV services

Article	HIV Service	Willingness to pay (%)
Uzochukwu et al. (2011)	HIV VCT	50
Adekunjo et al. (2020)	HCT	75
Evans et al. (2019)	Male condoms	50–90
Muko et al. (2004)	ART	69
Forsythe et al. (2002)	WTP for HCT	80
Dim et al. (2015)	Cervical cancer screening	94.5
Geldsetzer et al. (2020)	Community ART delivery	51.5
Mbachu et al. (2018)	ARVs	34.3
Evans et al. (2019)	Branded condoms	-
Thirumurthy et al. (2018)	HIV test kits	88
Begnel et al. (2020)	PrEP	61
Chiu et al. (2021)	Restock HIV test kits	96
Ashburn et al. (2020)	HIV self-test kits	65-69
Chirundu et al. (2017)	ART	66.4
Ayifah and Ayifah (2012)	PMTCT	91
Twimukye et al. (2017)	Attend an after-hours HIV clinic	-
Wandei et al.'s (2016)	VMMC	39.6
Isah et al. (2019)	PMTCT	97.1
Nwobi et al. (2017)	ART and HIV treatment monitoring	85.3
Isah et al. (2021)	PMTCT	69.4
(Otiso, 2016)	ART	64.5
Durosinmi-Etti et al. (2022b)	PrEP	73
Durosinmi-Etti et al. (2022b)	HIV self-testing (HIVST)	81
Durosinmi-Etti et al. (2022b)	Condoms	87
Durosinmi-Etti et al. (2022)	ART	92

More people were willing to pay for HIV diagnosis (80%) compared to HIV prevention (73%) and HIV treatment (67.7%), as shown in Figure 2.3. Although the theme of HIV prevention had the study that reported the highest proportion of people willing to pay (Isah et al., 2019), it also had the widest range (from 39.6% to 97.1%) of the proportion of people willing to pay compared to other HIV services. The findings reveal that the majority (68.4%) of the studies indicate that people are willing to pay less than the actual cost of full service in a real market. Only one study (Evans et al., 2019) reports willingness to pay amounts higher than the market value. Five articles (26.3%) did not state whether the amount was below or equivalent to or more than the actual market value. Except for one study, where 67.6% of the people reported that they believed the services should be free (Uzochukwu et al., 2011), the rest of the studies did not capture the reasons why some people are not willing to pay at all and why others are only able to pay part of the total cost of service. It is unclear from the literature whether it is entirely an issue of ability to pay or an indication of the utility that the surveyed people attach to the service. Thus, this gap needs to be addressed.

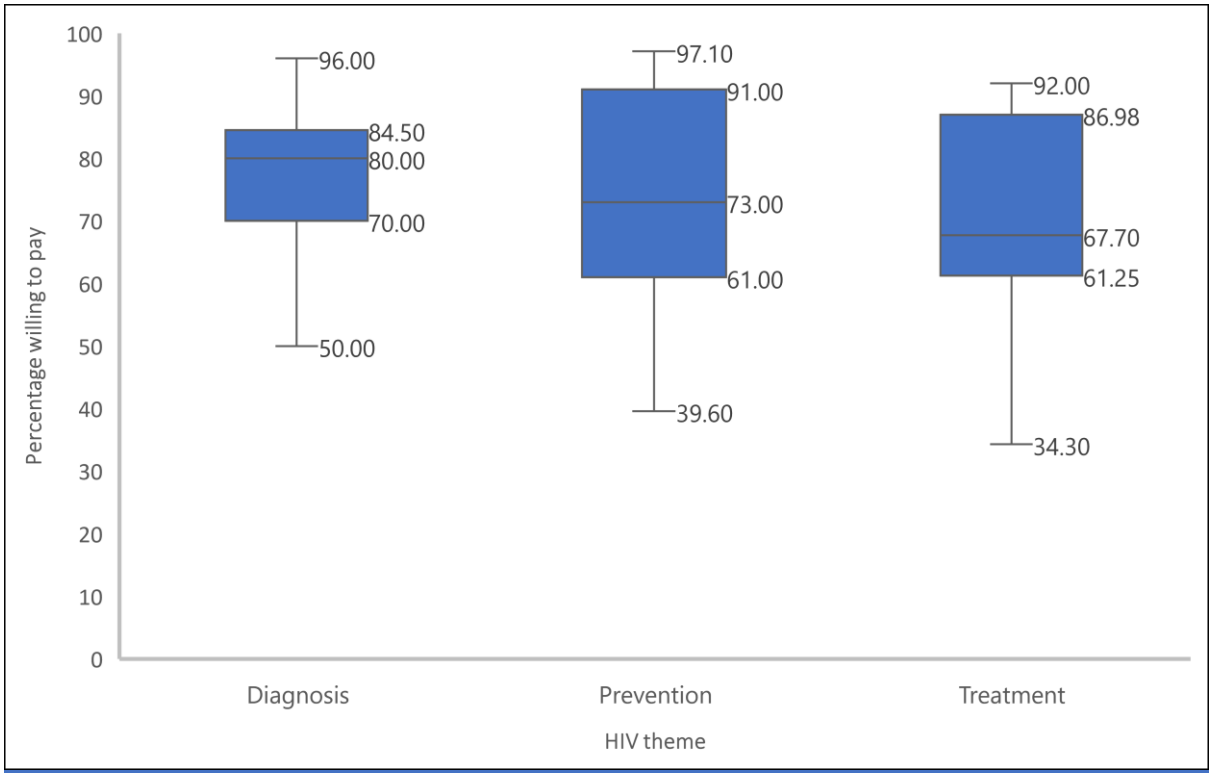

Figure 2.3 The percentage of people willing to pay for HIV services by theme

2.2.11. Methodological findings on willingness to pay for HIV services in Africa

The methods used to conduct WTP for HIV services studies were reviewed and are presented in Table 2.3. There is limited use of theory to underpin studies on willingness to pay for HIV services in Africa. Only one study conducted by Adekunjo et al. (2020) about the WTP for HIV counselling and testing services in Nigeria explicitly stated the study's theory. Chirundu et al. (2017) only mentioned the conceptual framework without stating the theory underlying it. Osanloo and Grant (2016b) state that all research is theoretical and should be guided by an appropriate theory. Adekunjo et al. (2020) used neoclassical economic theory, which assumes that people are rational and thus make decisions that maximise their utility (Culyer, 1989; Ostermann et al., 2015). The neoclassical economic theory is critiqued for assuming that human beings are always rational. However, this is not the case, as they sometimes make

decisions that are not in their best interest (Rice, 2013). Rice (2013) recommends integrating behavioural economic tools in health economics studies to address the shortcomings of neoclassical theory. To my knowledge, no study has documented the use of a mixture of neoclassical theory and behavioural economic tools to investigate the willingness to pay for HIV services in Africa.

Willingness-to-pay-for-HIV studies in Africa mainly use face-to-face interviews to collect data from respondents. Most studies (18, 78.3%) used interviewer-administered, face-to-face interviews to collect data, while three studies (Ashburn et al., 2020; Evans et al., 2019; Evans et al., 2011) (13%) used interviewer-administered electronic questionnaires to collect data. Only one study (Begnel et al., 2020) used virtual, automated, self-administered questionnaires to collect data through a mobile phone-based, short text message platform.

The total sample size of the included studies was 20,783, ranging from 26 respondents for a survey about drug shop owners (Chiu et al., 2021) to 6,566 participants for a multi-country study about WTP for condoms (Evans et al., 2019). Most (19, 82.6%) of the studies were conducted amongst users of the service under study, such as antiretroviral therapy and condom users. Two studies (Adekunjo et al., 2020; Wandei et al., 2016) were conducted amongst people drawn from the general population. One study (Uzochukwu et al., 2011) was conducted amongst university students. Most studies were conducted amongst populations already using the services, such as HIV-positive clients and condom users. The study that did not survey current users was about medical male circumcision, and it surveyed household heads, including women. Conducting WTP studies among people already using the service and thus already finding utility may lead to systematic bias (Malone et al., 2014). This is similar to what was found in a systematic review of WTP for HIV prevention technologies (Beckham et

al., 2021). Although Foreit and Foreit (2004) recommend that WTP studies for clinical services be conducted among people attending clinics, conducting WTP studies amongst people already using the service and thus who already find utility in the service may lead to systematic bias (Malone et al., 2014). The ideal study population for HIV prevention interventions is the general population. Prevention of new HIV infections offers a lasting solution to the HIV epidemic (Goosby et al., 2012). Therefore, a study that surveys clients from the general population on WTP for HIV prevention services is warranted to understand the factors associated with WTP for HIV services entirely.

Seven (30.4%) articles did not explicitly state how WTP figures were elicited. Among the 15 articles that mentioned the elicitation method, 46.7% (7/15) used the bidding game (Durosinmi-Etti et al., 2022; Durosinmi-Etti et al., 2022b; Evans et al., 2019; Mbachu et al., 2018; Muko et al., 2004; Otiso, 2016; Uzochukwu et al., 2011), another 26.7% (4/15) used the payment card (Adekunjo et al., 2020; Forsythe et al., 2002; Geldsetzer et al., 2020; Isah et al., 2021), and there was one study each for multiple price lists (Chiu et al., 2021), open-ended questions (Ayifah & Ayifah, 2012), biding game with minimum and maximum (Isah et al., 2019), and structured haggling (Nwobi et al., 2017). The available evidence indicates incomplete documentation of methods for the willingness-to-pay approach to HIV services. At 81.8% (18/22), the findings indicated that statistical analysis was mainly done using regression analysis among those articles that explicitly stated the data analysis used. The chi-square test (Isah et al., 2021) was used in one study.

Table 2.4 The study population, sample size, survey method, elicitation and statistical analysis used in WTP studies for HIV services in Africa

Article	Population	Sample size	Survey method	Elicitation method	Statistical analysis
1. Uzochukwu et al. (2011)	Students of tertiary institution	500	Interviewer administered questionnaire	Bidding game	OLS regression
2. Adekunjo et al. (2020)	The general population aged >20 years	768	Face-to-face interview	Payment card	Linear regression
3. Evans et al. (2019)	Males 18-49 who are condom users	1200 per country	Face-to-face interviews using electronic equipment	Bidding game	Linear regression
4. Muko et al. (2004)	Patients attending a rural hospital	84	Face-to-face interviews using structured and semi-structured open-ended questions	Bidding game	-
5. Forsythe et al. (2002)	VCT clients	748	Face-to-face interviews	Payment card	-
6. Dim et al. (2015)	HIV positive women	400	Face-to-face interview using a structured questionnaire	-	Odds ratio
7. Geldsetzer et al. (2020)	ART patients	1799	Face to face interview	Payment Card	Poisson regression
8. Mbachu et al. (2018)	Clients on ART	125	Face-to-face interviews using a structured questionnaire	Bidding game	OLS multiple regression
9. Evans et al. (2019)	Condom users	890	Face-to-face interview using a structured electronic questionnaire	-	Logistic regression
10. Thirumurthy et al. (2018)	Women attending ANC and PNC clinics	297	Face-to-face interviews	-	Poisson regression & OLS regression

11. Begnel et al. (2020)	General population	3825	Automated SMS self-administered	-	-
12. Chiu et al. (2021)	Drug shop owners	26	Face-to-face interviews	Multiple price list	Linear regression
13. Ashburn et al. (2020)	ANC clients and pharmacists	799	Face-to-face using a structured using an electronic questionnaire	-	Regression
14. Chirundu et al. (2017)	ART clients	552	Face-to-face administered questionnaire	-	Logistic regression
15. Ayifah and Ayifah (2012)	ANC clients	200	Face-to-face interviews	Open-ended bidding	Logistic regression
16. Twimukye et al. (2017)	ART patients and staff at the ART clinic	188	14 FDGs and 55 in-depth interviews	N/A	Thematic content analysis
17. Wandei et al. (2016)	Household heads	384	Face-to-face interview	-	Logistic regression
18. Isah et al. (2019)	PMTCT patients	104	Face-to-face using a structured questionnaire	Payment care with open minimum and maximum	Linear regression
19. Nwobi et al. (2017)	PLHIV	400	Face-to-face, the administered questionnaire	Structured haggling	Binary logistic regression
20. Isah et al. (2021)	PMTCT patients	219	Face-to-face administered questionnaire	Payment card	Chi-square, t-test
21. Otiso (2016)	PLHIV	337	Self-administered questionnaire	Bidding game	Logistic regression
22. Durosinmi-Etti et al. (2022)	PLHIV	400	Interviewer administered questionnaire	Bidding game	Logistic regression
23. Durosinmi-Etti et al. (2022b)	Key populations (MSM, FSW)		Interviewer-administered questionnaire	Bidding game	Logistic regression

2.2.12. Factors that affect the Willingness to pay for HIV services in Africa

Figure 2.4 shows the factors influencing WTP for HIV services in Africa. With 32 mentions, socio-economic status (income, employment, education level) was the most cited factor influencing WTP. The second most common factor, with a frequency of nine mentions, was knowledge about the service or product. The third most common factor was people's beliefs about the products under consideration, with eight mentions. The cost of the service or product is another factor influencing willingness to pay for HIV services in Africa, with six mentions in the reviewed articles. Perceived benefits and peers' influence or support from family were other factors that influenced willingness to pay. Detailed information on the factors that influence willingness to pay for HIV services in Africa is shown in Table 2.4.

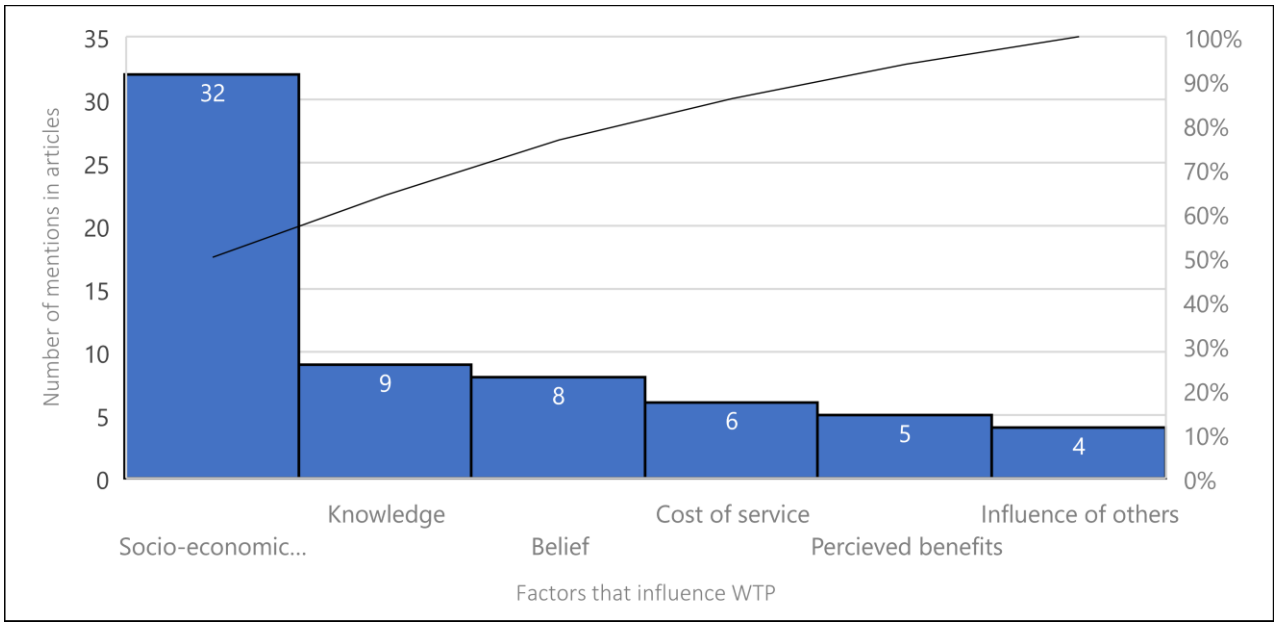

Figure 2.4 Factors that influence the willingness to pay for HIV services, as identified from the literature

Several socio-economic factors are significantly associated with WTP for HIV services in Africa. Out of the 23 articles, 11 found that income and employment status were significantly

associated with a positive willingness to pay (Adekunjo et al., 2020; Ayifah, 2010; Chirundu et al., 2017; Durosinmi-Etti et al., 2022; Durosinmi-Etti et al., 2022b; Evans et al., 2011; Isah et al., 2019; Mbachu et al., 2018; Muko et al., 2004; Otiso, 2016; Wandei et al., 2016). Nwobi et al. (2017) found that low socioeconomic status was significantly associated with unwillingness to pay for ART and ART monitoring in Nigeria. Chirundu et al. (2017) found that ART clients who experienced reduced income were significantly less likely to be willing to pay for ART services. Education was another socio-economic factor that was significantly associated with WTP. People with higher education were more willing to pay for HIV services than the less educated (Durosinmi-Etti et al., 2022b; Geldsetzer et al., 2020; Isah et al., 2019; Otiso, 2016; Uzochukwu et al., 2011).

Knowledge about HIV enhances willingness to pay for HIV services. Six articles in the literature found knowledge to be significantly associated with the willingness to pay for HIV services (Adekunjo et al., 2020; Dim et al., 2015; Durosinmi-Etti et al., 2022b; Evans et al., 2019; Mbachu et al., 2018; Wandei et al., 2016). Four of the five articles that found knowledge associated with WTP were about HIV prevention services. Only one of the five articles concerned treatment services (Mbachu et al., 2018).

The literature also indicates that attitudes towards the service significantly determine WTP for HIV services in Africa. Clients satisfied with the service provider at the ART clinic in Zimbabwe were more willing to pay for ART (Chirundu et al., 2017). Evans et al. (2019) found a similar relationship among condom users across several countries in sub-Saharan Africa. On the other hand, having a stigma about accessing antiretroviral therapy (Muko et al., 2004) was significantly associated with an unwillingness to pay for ART amongst patients attending a rural hospital in Cameroon.

Two studies showed a link between perceived behaviour control and the willingness to pay for services. Thirumurthy et al. (2018) found a significant association between the willingness to pay for HIV test kits and HIV risk. People with a high self-reported chance of acquiring HIV were more willing to pay than women attending antenatal and postnatal clinics in Kenya. Muko et al. (2004) found that disbelief in the efficacy of ART was significantly associated with an unwillingness to pay for ART in Cameroon. Worrying about HIV acquisition and fear of the stigma associated with HIV were significantly associated with the willingness to pay for HIV counselling and testing services in Nigeria (Adekunjo et al., 2020). In Zimbabwe, Chirundu et al. (2017) found that, amongst ART clients, practising no religion was associated with an unwillingness to pay for ART. In the same population, disclosing HIV status to a friend was associated with a willingness to pay for ART.

Table 2.5 Factors that influence the willingness to pay for HIV services in Africa

Objective	Factor significantly associated with WTP (+) enhances WTP, (-) decreases WTP	P-value	Articles
WTP for HCT	(+) Male (+) Higher education level (+) Knowledge of VCT	0.05 0.03 0.02	(Uzochukwu et al., 2011)
WTP for HCT	(+) Income (+) Knowledge of someone living with HIV (+) Knowledge of someone who died of AIDS (+) Worry about HIV infection (+) Fear of HIV-related stigma	0.001 0.006 0.026 0.001 0.005	(Adekunjo et al., 2020)
WTP for condoms	(+) Satisfied service user (+) Perceived brand value (-) Ability to pay		(Evans et al., 2019)
WTP for ART	(+) Male (+) Income (-) High cost (-) Stigma about HIV (-) Disbelief in the efficacy of antiretroviral therapy		(Muko et al., 2004)
WTP for voluntary HCT	-		(Forsythe et al., 2002)
WTP for cervical cancer screenings among HIV-positive women	(+) Knowledge of the risk of cervical cancer		(Dim et al., 2015)

WTP for community ART delivery	(+) Education level (-) Failure to disclose HIV status	0.048 0.049	(Geldsetzer et al., 2020)
WTP for ART	(+) Employment (+) Higher income (+) Socioeconomic status (+) Knowledge of ART adherence (-) Older age (-) Higher transport costs		(Mbachu et al., 2018)
WTP for condoms	(+) Satisfaction/Loyalty (+) Knowledge about the product (+) Market barriers	<0.001 0.007 <0.001	(Evans et al., 2011)
WTP for HIV self-tests	(+) Self-reported higher chance of acquiring HIV		(Thirumurthy et al., 2018)
WTP for PrEP	(+) Male	0.001	(Begnel et al., 2020)
WTP to restock HIV self-test kits	(-) High sale price		(Chiu et al., 2021)
WTP for HIV self-test kits	(+) Higher level of education (+) Higher level of socio-economic status (+) Having health insurance (+) Earning own income (+) Service managed by a faith-based organisation (+) Women with knowledge of HIV self-testing		(Ashburn et al., 2020)
WTP for HIV treatment	(+) Being employed. (+) Disclosure of HIV status to a friend (+) Satisfaction with a service provider	0000 0.02 0.04 0.02	(Chirundu et al., 2017)

	(+) Attending three months' scheduled reviews. (-) Reduction in income (-) Practising no religion	0.05 0.01	
WTP for PMTCT	(+) income		(Ayifah & Ayifah, 2012)
WTP to attend an after-hours co-pay clinic	Themes (+) Benefits of an after-hours clinic (choice, convenience, privacy) (-) Disadvantages of the after-hours clinic (fee might become mandatory for all, creates suspicion to pay for free clinical services, those who do not pay might receive poor quality services, need for equity) (+) Recommending service to a friend		(Twimukye et al., 2017)
WTP for VMMC	(+) Knowledge about VMMC's role in reducing HIV transmission	0.03	(Wandei et al., 2016)
WTP for PMTCT	(+) Education (+) Residence near specialised pharmacy (+) Trimester of pregnancy (+) Time spent reaching a health facility	0.046 0.03 0.02 0.02	(Isah et al., 2019)
WTP for HIV treatment and monitoring tests	(-) Low socioeconomic status (+) Salaried employment	<0.001 0.022	(Nwobi et al., 2017)
WTP for PMTCT	-		(Isah et al., 2021)
WTP for ART	(+) Education (+) Income	<0.05 <0.05	(Otiso, 2016)

	(+) Private medical insurance	<0.05	
WTP for ART	(+) Support from family	<0.01	(Durosinmi-Etti et al., 2022)
	(+) Monthly income	<0.01	
	(-) Lack of employment	<0.015	
	(-) Change in monthly employment	<0.01	
WTP for PrEP, Condoms and HIVST	(+) Age, marital status, education	-	(Durosinmi-Etti et al., 2022b)
	(+) Employment		
	(+) Monthly income		
	(+) Knowledge		

2.2.13. Qualitative general findings

Of the 23 articles that were reviewed, only one was qualitative. Twimukye et al. (2017) found willingness to co-pay, with some respondents willing to pay as high as UGX200,000 (£42.20) per visit. The themes associated with WTP include the benefits of a special clinic, such as privacy and short waiting time, convenience for those in formal employment and giving people another choice. However, some respondents were against the idea of paying to attend a special clinic. Themes associated with a negative attitude towards payment include the fear that fees might become mandatory for all HIV patients, including those attending the general clinic, poor quality services for those unable to pay and the belief that HIV services should be offered free. The other reason cited for unwillingness to pay is that the clinic is not a one-stop centre for additional services, such as the prostate cancer clinic.

2.2.14. Qualitative methodological findings

Twimukye et al. (2017) conducted semi-structured key informant interviews and focus group discussions. The key informants were clients with stigma, high net-worth individuals, busy

individuals and staff working at the clinic. The focus group discussions comprised randomly selected individuals attending the clinic on a given day. Whereas it is common practice to purposively select key informants because they are considered to have the required information (Payls, 2008), it may be misleading for a WTP study. Income is positively associated with willingness to pay (Adekunjo et al., 2020; Mbachu et al., 2018). The choice of participants in the study by Twimukye et al. (2017) for key informant interviews biases the findings favouring willingness to pay. It is not surprising that some individuals are willing to pay more than what is required for the service. The authors also acknowledge several methodological limitations of their study. First, the pool of clients to select participants for the focus group discussions was small. It was possible that those clients already had an ongoing cordial relationship with the interviewees, which could have biased the findings. Second, the authors acknowledge that they selected key informants who they thought had the educational ability to provide the required responses, which might have biased the findings. Therefore, another study is needed to address the methodological limitations of this qualitative study.

2.2.15. Summary of findings from the literature review

A systematic literature review on willingness to pay for HIV and AIDS services in Africa was conducted. The review found the following:

- Twenty-three articles that met the requirements for inclusion in the final review were found. The main reason for dropping some preference studies is that they focused on the trade-off for specific HIV and AIDS services using the discrete choice and willingness-to-accept (WTA) elicitation method but did not assess the willingness to pay for the service.

- The studies covered HIV counselling and testing (seven articles), antiretroviral therapy (nine articles) and HIV prevention (nine articles). Although HIV prevention has the majority of the studies, there are just three articles about PMTCT, while PrEP and condoms each have two articles. VMMC and cervical cancer screenings amongst people living with HIV have just one article each.

- Evidence supports the willingness to pay for various HIV and AIDS services in Africa. However, in most studies, people are willing to contribute, rather than meet, the entire cost of the service/product.

- Most of the studies were quantitative, with only one qualitative study, and none used a mixed-methods approach.

- The bidding game is the most common method for eliciting maximum WTP choices.

- Except for one study, the rest did not state the underlying theory.

- Socioeconomic status, beliefs and knowledge are common factors significantly affecting willingness to pay for HIV services.

The deficiencies in the reviewed studies highlight the need for further research on WTP for HIV and AIDS services in Africa. Specifically, a study on the willingness to pay for VMMC using a mixed-methods approach is warranted.

2.3. Chapter summary

Chapter 2 covered the literature on willingness to pay for HIV and AIDS services in Africa. The chapter shows willingness to pay for HIV services, albeit with knowledge gaps. Evidence of

willingness to pay for male circumcision remains scanty, with several methodological gaps that must be addressed. This chapter has highlighted the importance of conducting a new study to fill the knowledge gaps in the available literature. Following the findings presented in the current chapter, a study on the ability and willingness to pay for VMMC in Uganda was conducted. The next chapter, Chapter 3, presents the research paradigm, which is informed by the findings of the systematic review. The inadequate use of theories to underpin willingness-to-pay studies is one of the gaps highlighted in Chapter 2, and the next chapter attempts to address this gap by presenting the philosophical paradigm for used in the current research.

3. RESEARCH PARADIGM

3.1. Introduction

Chapter 2 presented a systematic review of WTP for HIV services and highlighted the prevailing knowledge gaps. The purpose of the current chapter is to present what informs the decision to use mixed methods in a PhD thesis for health economics and policy. Studies that use mixed methods in health economics research are exceedingly rare (Dopp et al., 2019).. Chapter 3 presents the research paradigm used to answer the research questions and address the gaps identified in the literature. Rehman and Alharthi (2016) define a research paradigm as an underlying system of beliefs, values and theoretical frameworks about what constitutes knowledge and how it is acquired. I present my philosophical position and how it informs the methodology undertaken. The chapter starts with the philosophical paradigm that underpins my research (Section 3.2). Appropriate theories that guide the current study are presented in Section 3.4. Next, the methodological structure that includes the contingent valuation method is presented in Section 3.5. In this chapter, I also substantiate the choice of methods (Section 3.6), and the chapter concludes with a conceptual framework (Section 3.7).

3.2. Philosophical paradigm

Research is a systematic investigation that seeks to contribute to the body of knowledge (Bowling, 2014) by answering questions. The path an individual researcher takes to answer a research question depends on how the person views what constitutes acceptable knowledge and the process by which it is developed, termed the research philosophy (Saunders & Tosey, 2013). A research philosophy is a system of beliefs and assumptions about developing knowledge that lies on a continuum (Saunders et al., 2015). On one end, the research process

is highly rigorous, objective, and data-driven, such as scientific experiments, whose findings may be generalisable. In contrast, on the other end, it is a highly subjective process in which the researcher's perspective shapes the conduct and interpretation of the results. A researcher's philosophical position along the continuum guides their research. In the next section, 3.3, I present where I lie on the philosophical continuum and what informs my location.

3.3. Researcher's philosophical positionality

A research paradigm is a loose collection of logically connected assumptions and concepts that orient the researcher's thinking (Rehman & Alharthi, 2016). As a researcher, I believe in scientific enquiry guided by research questions, and I am not fixated on any specific paradigm. From the literature review, it is evident that there is a need to quantitatively and qualitatively investigate the willingness to pay for male circumcision. The approach to addressing the gaps identified in the literature should enable the researcher to measure the willingness to pay quantitatively and allow probing into the reasons that inform the decisions to pay or not pay for male circumcision. Therefore, I opt to be practical and pragmatic in my current research and to explore the WTP for VMMC quantitatively and qualitatively, as needed.

The philosophical stance of pragmatism assumes that no single research philosophy can ever give a full view (Weaver & Frey, 2018). Pragmatism is not aligned with either objectivism or subjectivism but mainly focuses on the "how" and "what" of research (Creswell & Creswell, 2017). Its strength lies partly in triangulating methods to achieve the best results. The focus of pragmatism is the research question and not necessarily a fixed mindset to a specific paradigm (Kaushik & Walsh, 2019), allowing the refinement of methods during the research process as needed. Pragmatism also enables the researcher to generate results for various audiences,

such as policymakers and consumers of services (Garces, 2022), which aligns with the current study's objectives.

As a research paradigm, pragmatism rejects traditional dichotomous philosophical divisions into objectivism and subjectivism but instead draws on both epistemological positions to guide the conduct of research (Kaushik & Walsh, 2019). A pragmatic paradigm allows the triangulation of theories and methods to inform inquiry (Kelly & Cordeiro, 2020). As such, pragmatism affords the discipline of health economics to explore the context of research while retaining the traditional positivist theory-led approach (Coast et al., 2004). Additionally, Long et al. (2018) recommend using methodologies that allow exploration of the environment in which healthcare is provided to respond to the complexity of health systems. Portney (1994) recommends using personal interviews, close-ended questions, reminding participants about the opportunity cost of substitutes and questioning respondents on factors underlying their choices while conducting WTP studies. These recommendations align with the current study's objectives. To achieve all this in one study, a research paradigm that allows the triangulation of methods is required, and that is pragmatism.

Pragmatism has been criticised for mixing empirical and normative methods without structure (Makombe, 2017). This has the potential to cause misinterpretation of the findings and the possibility that the researcher might lose focus on the original objectives of the research. However, this can be mitigated by using theories to guide the research enquiry and interpretation of the findings. In the current study, this limitation is addressed by locating the study within existing theories that facilitate the conduct and interpretation of the findings. The theories that guide the current study are presented in Section 3.4.

3.4. Theories for consumer preferences

Starter (2005, as cited in (Osanloo & Grant, 2016a) notes that all research is theoretical, and research findings and recommendations are limited if a theoretical framework does not guide the study. The approach taken depends on whether the aim is to test theory (deductive) or to build theories (inductive) (Bryman, 2016). According to Robert K. Merton (1967), as cited in (Remler & Van Ryzin, 2021), a theory is a logical conjecture of how something should work. Imenda (2014) summarises the components of a theory as a set of interrelated propositions, concepts and definitions that present a systematic point of view and specify relationships between or among concepts.

As identified in Chapter 2 (systematic review), there is generally a gap in understanding the reasons that inform consumer preferences in their willingness to pay for HIV services in Africa, including voluntary male circumcision. To fully understand the WTP for VMMC, the economic and non-economic factors influencing WTP should be explored. The current study is based on two main theories: economic theory and the theory of planned behaviour. The economic theory is presented first, followed by the theory of planned behaviour.

3.4.1. The Economic theory

Basic economic theory was first developed 300 years ago by early economists Nicholas Bernoulli, John von Neumann and Oskar Morgenstern. It, however, did not gain prominence until the late 19th century when the term *homo economicus,* or economic man, was coined (Persky, 1995). Basic economic theory assumes that rational, forward-thinking individuals consume products or services that enhance their welfare while expending minimally (Culyer, 1989). The economic theory has undergone various iterations, and the most used term is utility

theory, which posits that consumers make choices based on anticipated returns (Bray, 2008). Culyer (1989) asserts that people buy healthcare goods based on anticipated utility. The amount of disposable income and knowledge regarding the product or service are the other factors determining the products and services people buy. The current study finds the economic theory appropriate because it is anticipated that prospective consumers of VMMC will pay for it if the anticipated cumulative benefits of VMMC are greater than the cumulative costs and discomforts associated with VMMC.

The economic theory is criticised for assuming rationality since man is not always rational (Bank, 2014; Kahneman, 2003). To act rationally, one is expected to know the service or product one intends to consume and thus make an informed decision. Furthermore, to act rationally, one needs knowledge about the product. In several studies, knowledge is documented to influence economic decisions, as presented in Chapter 2. However, there is often no time to assess options in real life, and decisions are often less rational. Instead, underlying values, beliefs, and social relationships influence decisions (Simon, 2013).

Additionally, other factors beyond rationality constrain action; therefore, economic theory may not wholly explain what drives actions, such as purchasing VMMC. From economic theory, the variables of income, which is indirectly influenced by socioeconomic status and knowledge of the product, are identified as factors influencing willingness to pay. In the current study, these variables were investigated. The following section presents other theories that attempt to explain consumer behaviour since economic theory is insufficient.

3.4.2. Psychodynamic, behavioural and cognitive theories

Several theories have attempted to explain consumer behaviour. This section does not attempt to review all of them comprehensively; rather, the evolution of the theory of planned behaviour (Ajzen, 1991) that is used in the current study is presented.

In his psychodynamic approach, Sigmund Freud (1856–1939) asserts that biological factors influence human behaviour intrinsically (STEWART, 1994). Freud identifies three factors, namely the Id, psyche and superego, as intrinsic forces that act from inside an individual to influence their actions (Freud, 1927). Freud's theory is counteracted by behaviourists such as Ivan Pavlov 1849–1936, John Watson (1878–1958), and Burrhus Skinner (1904–1990), who posit that human behaviour is subject to external factors and can be learned and unlearned (Bray, 2008).

The works of early philosophers, such as Socrates and Descartes, who were interested in the origins of knowledge and how it is mentally processed, suggest otherwise to the theory that behaviour can be learned and unlearned. They postulate that behaviourism is not entirely learned but that there is an element of cognition and influence from the individual's environment (Sternberg et al., 2012). Hebb's stimulus-organism-response model supports cognitive theory (Cziko, 2000). Like economic theory, cognitive theory is criticised for assuming that humans always act rationally, yet this is not the case (Hawkins & Roger, 2009). Other theories, termed cognitive analytic models, which include the consumer decision model and the theory of buyer behaviour, all attempt to explain purchase decisions but are equally critiqued for assuming a rational consumer and generalisation of the decision process, ignoring diversity among consumers (Erasmus et al., 2001).

All the theories stated in this section are not appropriate for the current research because of their limitations, and none complements economic theory. Next, the theory of planned behaviour suitable for the current study is presented.

3.4.3. Theory of planned behaviour (TPB)

The theory of planned behaviour has evolved over the years and belongs to a group of prescriptive models (Bray, 2008). Martin Fishbein took the earliest work under the prescriptive models with his Fishbein model. The original and subsequent iteration of the Fishbein model posits that a person's attitude towards an object is a summation of their beliefs and feelings about that object (Bamossy & Solomon, 2016). Ajzen further developed the Fishbein model to assess attitude and behaviour, and it thus became known as the theory of reasoned action (Ajzen, 1985a; Fishbein et al., 1975). The theory of reasoned action posits that a person's behaviour towards purchasing a product is a summation of their attitude and subjective norms. Subjective norms include the influence of other people on a person's decision and their motivation to accept or reject responding to the influence (Bamossy & Solomon, 2016). The theory of reasoned action is criticised for oversimplifying the relationship between intention and behaviour by assuming that intention results in action, yet other intervening factors exist (Sheppard et al., 1988). In response to the criticism, Ajzen modified the theory of reasoned action into the theory of planned behaviour (TPB) by adding mediating variables (Ajzen, 1985a).

The theory of planned behaviour postulates that behaviour intention, for instance, paying for voluntary medical male circumcision, is a function of the attitude towards the object or service, the influence of subjective norms and perceived behaviour control, as shown in Figure 3.1. Attitudes refer to a person's overall evaluation of a situation; subjective norms are peer

influences on the individual, while perceived behaviour control is the person's self-assessment to perform the expected behaviour (Francis et al., 2004). In the model, "intention" is a proxy measure for performing the behaviour (Francis et al., 2004). The TPB is widely used as the dominant expectancy-value theory (Shaw et al., 2000) and has been applied to WTP studies (Raygor, 2016; Zhang et al., 2018; Zhang & Fukuda, 2019). The theory retains its original integrity despite the modification to add a context-specific variable (Ajzen, 1991). The theory is easy to comprehend and applies to various research contexts (Conner & Armitage, 1998). The limitations of the TPB include the dependence on the researcher to accurately identify all the consumer's attitudes in decision-making (Bamossy & Solomon, 2016). The model does not consider inhibiting factors from purchasing decisions (Sutton, 1998).

The limitations notwithstanding, the TPB is the most appropriate theory for the current study. Economic preferences are essential in determining WTP for a service, such as VMMC, but they are insufficient. The theory of planned behaviour offers a framework for investigating other factors that underlie willingness-to-pay decisions. An individual's evaluation of performing a given behaviour influences their attitude towards the action. This may explain why, despite the ability to pay, VMMC clients may opt not to pay, as documented by Wandei et al. (2016), and thus the need to explore it. Therefore, the current study explores quantitative and qualitative factors influencing WTP for VMMC in Uganda as an option for sustaining HIV prevention interventions. The quantitative factors were determined using the contingent valuation method.

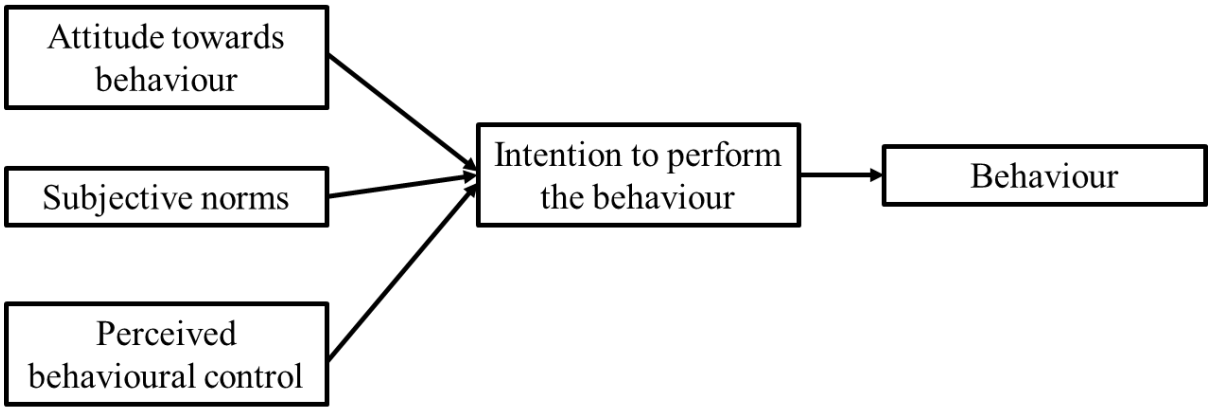

Figure 3.1 Framework for the theory of planned behaviour (Ajzen, 1991)

In the current study, the components of the TPB framework were applied as follows:

- Behaviour: This refers to the willingness to pay for voluntary male circumcision.
- Intention to perform the behaviour: This is a proxy indicator for using the desired behaviour (WTP for VMMC).
- Attitude towards behaviour: This is a person's overall evaluation to pay for VMMC.
- Subjective norms: This refers to the influence of peers and others on the individual considering paying for VMMC.
- Perceived behaviour control: This refers to an individual's ability to pay for VMMC.

Three independent variables influencing the dependent variable (willingness to pay) were identified from the theory of planned behaviour: attitudes, subjective norms, and perceived behavioural control. The independent variables investigated in the current research were identified from the literature review and the theories (economic theory and theory of planned behaviour).

3.5. Willingness-to-pay approach

Estimating the monetary value of health technologies is inevitable in health policy development and planning (Himmler, 2021). Several approaches are used to value health benefits. The willingness-to-pay method is one of the tools used to measure health benefits in cost–benefit analysis by eliciting the consumer's value for non-market health goods, such as VMMC (Steigenberger et al., 2022b). Other approaches to assigning monetary values to non-health benefits have significant theoretical and methodological limitations (Himmler, 2021; Klose, 1999).

Willingness-to-pay studies are conducted from two perspectives. First, it predicts the demand for goods that have yet to be introduced into the market, such as VMMC. Second, it determines the benefits to a community that arise from providing a good or service (Baker et al., 2014). The determination of the price using the WTP may be obtained either indirectly through measuring the monetary value of trade-offs to the desired product (revealed), that is, by observing expenditure data in an actual market, or directly by asking the consumer how much they would be willing to pay to get a given product or willing to accept as compensation for foregoing a good or service (Bishop & Heberlein, 2019). The former does not apply to the current study because VMMC is offered gratis. The focus is on the latter, termed the contingent valuation method (CVM), because it is based on a hypothetical situation (Bishop & Heberlein, 2019). The contingent valuation method facilitates the determination of the prices at which health technologies can be introduced into the market (Steigenberger et al., 2022b). It enables policymakers to fill funding gaps between what individuals can pay and the actual cost of services (Steigenberger et al., 2022b). Whereas the willingness-to-pay approach originates in and is predominantly used in environmental economics (Carson, 2012), it has also been applied

to health economics to determine health benefits (Steigenberger et al., 2022b). Arhin (1998) states that the reasons for conducting willingness-to-pay studies include the following:

- Lack or absence of a previous market for a good or service because it is provided free, or it is a new technology: This is partially why it was used in the current study.
- It is difficult to determine the maximum price consumers can pay. This is because the product or service was previously subsidised, such as voluntary medical male circumcision.

Contingent valuation questions may be posed in two ways, either by probing how much an individual would be willing to pay to avoid a negative consequence or achieve a positive experience and or by analysing how much they would be willing to accept (WTA) as compensation to forego a benefit they have been enjoying or to receive a negative experience. Basic economic theory suggests that both should lead to the same response without income effects (Varian, 2014). The choice between WTP and WTA is a matter of agency rights and depends on whether the individual must purchase the service or have the right to sell the goods or services (Mitchell & Carson, 2013). Bayoumi (2004) notes that willingness-to-pay questions yield more precise and accurate results than willingness to accept. The current study uses the willingness-to-pay approach because the intention is to determine willingness to purchase VMMC services, since the service is currently not available at a fee. Therefore, the WTA approach was not appropriate for the current study.

Mitchell and Carson (2013) state four ways of eliciting contingent valuations. They include the take-it-or-leave-it, open-ended questions, bidding game and payment cards. The bidding game simplifies CVM and is thus widely used (Bayoumi, 2004). The current study uses the bidding

game method because of its simplicity. The open-ended approach asks individuals to state the maximum they are willing to pay. It often results in very high, unrealistic figures or low, or even protest zero offers (Desvousges et al., 1983). The take-it-or-leave-it approach uses a dichotomous (yes or no) question of whether an individual would be willing to pay for a service at a given price. The bidding game mirrors the open market (Onwujekwe, 2004), almost like the take-or-leave-it method. Payment cards are used to guide bidding by displaying bid amounts. Individuals are asked to offer a bid in response to a question about consuming a service or product. The question is repeated with a higher figure until the individual says no.

The contingent valuation method has been widely used in health economics to measure health benefits (Klose, 1999). CVM is applied in different contexts across the health sector. It is used in both high- and low-income countries (Hajek et al., 2020; Nosratnejad et al., 2016), used in both disease prevention (Corso et al., 2002; Farabi et al., 2020) and curative interventions used in communicable diseases, such as anti-malaria interventions (Trapero-Bertran et al., 2013), HIV and AIDS services (Adekunjo et al., 2020), and used in studies on non-communicable disease conditions such as cancer and diabetes (Long et al., 2016). The wide application and use of the contingent valuation method across various contexts alludes to its strength as an approach for measuring health benefits.

The benefits of using the contingent valuation method include its ability to value non-existent products that have yet to be introduced into the regular marketplace (Hensher, 2006). Second, unlike discrete choice experiments, CVM has the advantage of direct interaction with individuals and thus offers the opportunity to clarify questions, unlike discrete choice experiments (He et al., 2017). The CVM also has a more robust theoretical underpinning in welfare economics than other methods (Klose, 1999). It also enables one to conduct a cost-

benefit analysis, thus allowing comparisons within health and to compare health with other sectors (O'Brien & Gafni, 1996). Thus, the CVM approach is the appropriate method for the current study to determine payment for VMMC, a free service in Uganda. However, the CVM also has some limitations, notably starting point bias and the mismatch between prices stated in hypothetical and actual markets (Schmidt & Bijmolt, 2020). Another limitation of the CVM is its inability to determine the motivation behind economic preferences (Boyle, 2017).

Using a single theory to underpin WTP studies limits the interpretation of the findings (Wall et al., 2007). The limitations of the CVM can be addressed through a robust study design to preserve the method's utility and thus serve its intended purpose (Carson et al., 2001)The current study addresses the limitations by using a mixed-methods design that allows for an interrogation of the motivation behind stated quantitative preferences.

3.6. Mixed-methods research

Flexibility with the methodological approach is paramount for a deeper understanding of a topic, such as the willingness to pay for VMMC, that is not well documented. There are three broad research methods: quantitative, qualitative and mixed. Quantitative research aims to quantify, count and determine relationships and is typically concerned with the "how many" and "how often" types of research. Quantitative research is generally considered objective because the researcher is not part of the research instruments, de-emphasising individual judgements and favouring established procedures that aim to generalise findings beyond the study population (Rashid et al., 2019). Quantitative data come from predefined close-ended tools, such as tests and questionnaires (Creswell & Creswell, 2017).

On the other hand, qualitative research aims to provide a deeper understanding of phenomena. It mainly deals with "why" and "how" and allows investigation into complex phenomena within a specific context (Remler & Van Ryzin, 2014). Qualitative data come from open-ended tools, usually without predefined answers (Creswell & Creswell, 2017). The mixed-methods design offers a middle ground. It allows the triangulation of qualitative and quantitative research designs to enrich the research process and better respond to the research questions (Dawadi et al., 2021).

Whereas mixed methods emerged early in the 20th century, it was not until Campbell and Fiske (1959) introduced the triangulation of methods at that time, termed multiple operationalism, that mixed methods started gaining recognition as a third methodological approach (Johnson et al., 2007). Multiple operationalism was developed as an approach for validating and explaining the variance in the phenomenon under enquiry. The thinking was that once two independent methods validated a phenomenon, the uncertainty around it was dramatically reduced. Webb et al. (1966) introduced the term triangulation, following the work of Campbell and Fiske.

Triangulation uses multiple methodologies to investigate an issue (Denzin, 2017). Denzin (2017) identifies four triangulation levels: investigator, data, methods and theory. Further, he identifies two broad categories of triangulation between methods, which refers to using both qualitative and quantitative methods and within methods involving several qualitative or quantitative methods in the same study. The between-methods triangulation further contributed to the evolution of mixed methods (Johnson et al., 2007). The mixed-methods approach was further developed by several sociologists, including Morse (1991), who identifies levels of triangulation as being sequential, in which either qualitative feeds into quantitative or

vice versa in the same study, or mixed in which both qualitative and quantitative designs are used simultaneously (Creswell & Clark, 2017).

Several authors have documented the importance of using mixed methods. Poth and Munce (2020) state that at the level of research design, qualitative data can support quantitative data by identifying concepts to be surveyed, while quantitative data can identify a representative sample for qualitative enquiry. At the data collection level, quantitative data may provide baseline information to avoid a biased sample for qualitative enquiry. At the data analysis level, qualitative data provide insight into quantitative findings (Dawadi et al., 2021). The rationale for the mixed method is further supported by Greene et al. (1989), who presented five reasons for using the mixed method. The first is triangulation, which aims to find convergence in findings; the second is complementarity, which aims at elaboration of results; the third is a further development in which one method informs the other; the fourth is initiation or discovery of contradictions; and the last is an expansion of the breadth of enquiry. Whereas many more authors have documented the rationale for mixed methods, the work of Collins et al. (2006) is all-encompassing in providing the reasons for using mixed methods. Collins et al. give the rationale as participant enrichment, instrument fidelity treatment integrity and significance enhancement. Mixed methods are instrumental in health research because they provide a more profound and fuller understanding of phenomena in health (Wasti et al., 2022). For these four reasons, the mixed-methods approach was appropriate for investigating the ability and willingness to pay for male circumcision in Uganda.

Various terms have been used in the literature to describe mixed methods. They include blended research, integrative research, multi-methods, triangulated studies, ethnographic residual analysis, mixed research and qualitative and quantitative research (Johnson et al.,

2007). Recent literature has commonly used mixed methods (Bryman, 2016). Whereas the names may differ, the essence of all these terms is that qualitative and quantitative methods are mixed. The next essential issue is at what level and to what extent mixing should occur. Mixing methods are recommended at all research levels, including formulating research questions, designing, data collection, analysis, and interpretation, for as long as possible (Creswell & Clark, 2017). The extent of mixing has three categories. The first is purely mixed, in which the researcher believes in and applies qualitative and quantitative methods. The other two categories involve complementing one predominant method to enrich the enquiry (Johnson et al., 2007). The difficulty in determining the level and extent of mixing methods accounts for some of the limitations of using mixed methods (Creswell & Clark, 2017).

The major limitation of using mixed methods is the application of two contrasting epistemological stances in the same research (Bryman, 2016; Zou et al., 2014). At one end, it is a purely positivist approach, in which theory is stated a priori and driven by an objective process. On the other hand, it is a subjective process in which there is no one meaning to reality; it all depends on the context. The researcher is part and parcel of the qualitative research enquiry. The second operational limitation is the resources, such as time and funds, needed to undertake a mixed methodology in the same study (Zou et al., 2014). The limitations were adequately addressed in the current research to take advantage of the strengths of mixed-methods research thoroughly. The first challenge was addressed using an explanatory sequential approach (Creswell & Creswell, 2017). First, quantitative analysis was conducted, followed by qualitative analysis. The qualitative results were used to gain deeper insight into the quantitative findings. The second challenge regarding the number of resources required to

conduct mixed-methods research was addressed by limiting the scope of the study to suit the available resources within the confines of a PhD thesis.

3.7. Conceptual framework

A conceptual framework is a graphical or written description of the variables in a study and how they relate to one another (Imenda, 2014). The current study's dependent or outcome variable is the willingness to pay for voluntary medical circumcision. Based on the literature review and theories, willingness to pay is influenced by various independent variables. The broad independent variables include economic and behavioural factors. Economic factors include socioeconomic status and knowledge of the product. The behavioural factors include factors such as attitude, subjective norms, beliefs and planned behaviour control. The independent and dependent variables are presented in Figure 3.2.

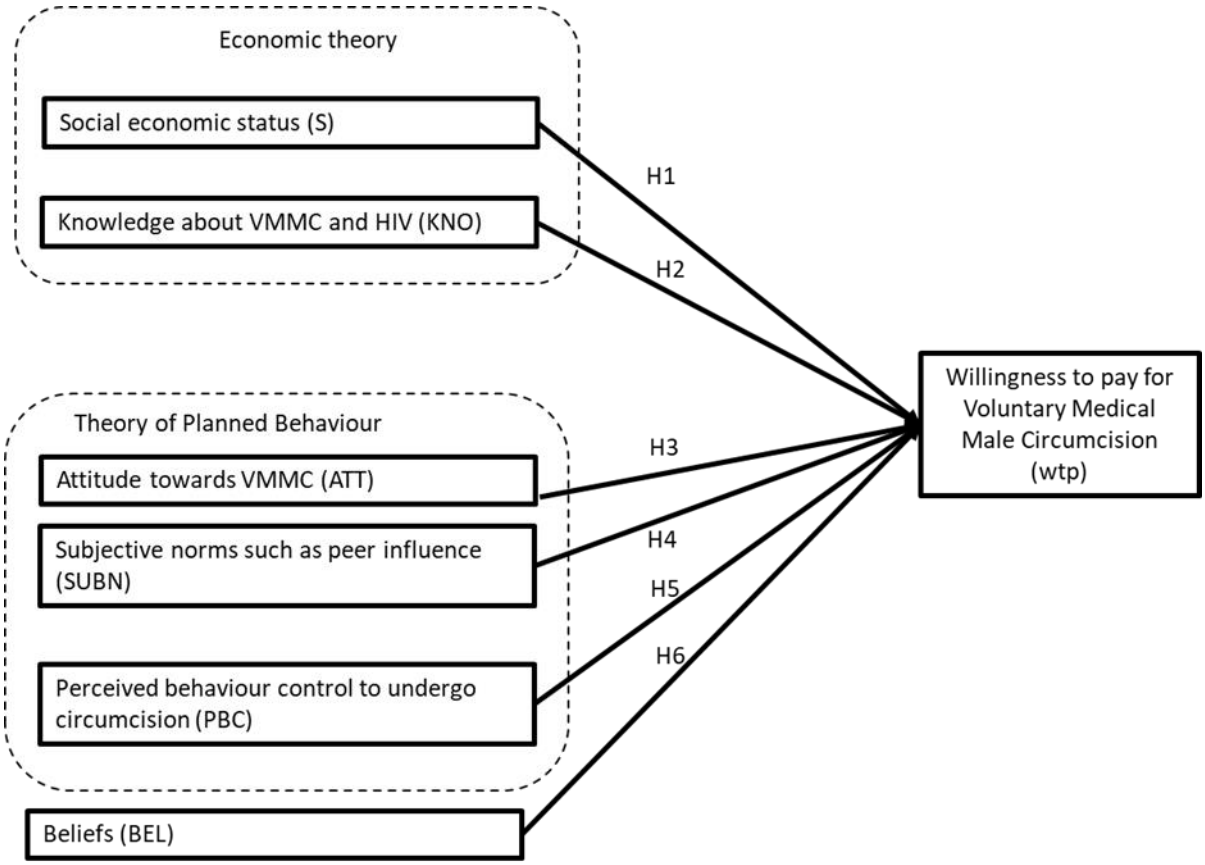

Figure 3.2 Conceptual framework showing factors that influence willingness to pay for voluntary medical male circumcision

From the conceptual framework, the following hypotheses were developed:

1. Hypothesis 1 (H1): People of high social and economic status (income, education, etc.) are likely to be willing to pay for VMMC.

2. Hypothesis 2 (H2): People with knowledge of HIV and VMMC are likely to pay for VMMC.

3. Hypothesis 3 (H3): People with a positive attitude towards VMMC are likely to pay for VMMC.

4. Hypothesis 4 (H4): An individual's willingness to pay for VMMC is likely to depend on the opinions of other people.

5. Hypothesis 5 (H5): An individual's positive perceived behaviour control to undergo VMMC is likely to influence the willingness to pay for VMMC.

6. Hypothesis 6 (H6): An individual's beliefs about circumcision influence the willingness to pay for VMMC.

3.8. Chapter summary

The current chapter has presented pragmatism as the ideal philosophical stance for investigating the ability and willingness to pay for VMMC. It explains why pragmatism is appropriate for answering the study questions and outlines its advantages and disadvantages.

Following the literature findings that, out of 23 papers reviewed, only one explicitly stated the theory underpinning the study, the current chapter has presented the economic theory and the theory of planned behaviour as appropriate theories to guide the study. The two theories identified income, knowledge, attitudes, subjective norms, and perceived behaviour control as key variables influencing willingness to pay.

This chapter also presents the willingness-to-pay approach and explains why it is applied to the current study. The pros and cons of the WTP approach are also presented. Additionally, following the gap identified in the literature of little or no information on qualitative factors that influence willingness-to-pay decisions, the mixed-methods study design was presented in the chapter with reasons why it is appropriate for the current study.

This chapter concluded by providing a conceptual framework that illustrates the link between the study's concepts, the study variables, and the hypotheses investigated. The conceptual framework is based on economic and planned behaviour theories. The theories and conceptual

models presented in the current chapter highlight the need to use mixed methods. The mixed methods required to answer the research questions are covered in Chapter 4.

4. METHODOLOGY

4.1. Introduction

Chapter 4 presents the methodology used in the current research to answer the research questions. From the previous chapters, the need to use mixed methods to answer the research questions was identified. In this chapter, the study design is presented in Section 4.2. Section 4.3 covers the quantitative approach, followed by the qualitative approach in Section 4.4. Both methods cover the rationale for the specific approach used, the study participants, the process of selecting them and the choice of methods. Also covered in this chapter are the study variables, their measurement and data analysis. Section 4.5 describes how the study findings were interpreted. The ethical considerations of the study are also covered in Section 4.6.

4.2. Study Design

The present study used a mixed-methods, cross-sectional study design. Ranganathan and Aggarwal (2018) define a study design as a framework of methods and procedures for collecting and analysing data on a given set of variables to answer specific research questions. The type of study design used in a given study is determined by the research questions to be answered, the purpose of the study and the resources available to conduct the study (Ranganathan & Aggarwal, 2018). There are two broad study designs: descriptive and analytical. Descriptive studies aim to describe the phenomenon under investigation and compare it to the general situation, while analytical studies aim to establish causal relationships and associations and test the hypothesis (Ranganathan, 2019). The current study is an analytical study design because it aims to determine the willingness to pay for voluntary medical male circumcision and not merely to describe it. Analytical studies are further divided

into experimental studies in which the researcher administers the exposure or observational studies in which the exposure may naturally occur. Observational analytical studies are further grouped into cross-sectional, case-control and cohort studies. The current study uses a cross-sectional study design, in which the topic of study is investigated at a specific point in time and exposure and outcome occur simultaneously (Ranganathan, 2019). In the current study, the ability and willingness to pay for male circumcision were studied at a specific point in time; thus, a cross-sectional study design was ideal. Some advantages of using a cross-sectional study design include, that it is cheap compared to other designs because it is conducted over a short period and allows the investigation of several variables simultaneously. For this PhD thesis, a cross-sectional study design was appropriate, given the available financial and time resources. The disadvantages of using a cross-sectional study design include the possibility of missing the phenomenon of interest at the point in time when the study occurs and the inability to conduct cause-and-effect studies (Rivers, 2017). The cross-sectional study design is applied to quantitative, qualitative and mixed-methods studies. The following section presents the quantitative methodology component of the study.

4.3. Quantitative approach

Quantitative approaches aim to quantify phenomena, relationships and associations (Rashid et al., 2019). The first objective of the current research is to identify the factors determining the ability to pay for voluntary medical male circumcision in Uganda, and the second objective is to determine the factors associated with the willingness to pay for voluntary medical male circumcision services in Uganda. Therefore, both objectives are quantitative and follow a quantitative methods approach to investigate willingness to pay for VMMC.

There are several methods for assessing individual preferences. These include the willingness to pay, standard gamble and time trade-off (Torrance, 1986). The WTP approach is used instead of the standard gamble and time trade-off in the current study because, unlike the other two approaches, WTP is based on the concept of opportunity cost between a health programme, such as VMMC, and other items on which the individual may opt to spend their money. The standard gamble and time trade-off measure the trade-off between the probability and the length of survival, respectively, which are thus not appropriate for the proposed study (Birch et al., 1999; Torrance, 1986). Additionally, VMMC benefits an individual and is a public good because when many people are circumcised, overall HIV transmission is reduced at the population level. Therefore, the method selected for economic valuation should also be able to measure social welfare. WTP allows for the valuation of individual welfare enhancement and social welfare; thus, it is the appropriate approach for the current study. Specifically, contingent valuation is a survey-based method used to elicit direct monetary value for the VMMC program (Bishop & Heberlein, 2019). This approach is used because it approximates a realistic market; it thus generates more valid responses and has a high response rate (Boyle, 2017).

4.3.1. Study population

Owing to the prevailing COVID-19 lockdown restrictions that limited non-essential, community-based activities in Uganda at the time the study was conducted, the current study was conducted amongst adult males drawn from a database maintained by the International Growth Research and Evaluation Centre (IGREC) (IGREC-International Growth Research & Evaluation Center, 2019). IGREC compiles and regularly updates a database compiled from all regions of the country, with more than 10,000 respondents representing the general

population in Uganda. The people in the database are randomly selected with quotas that mirror the general population for age, sex, religion, employment and residence. It is used in various activities, including market research, opinion polls, brand research, monitoring and evaluation, and academic research. Respondents receive phone airtime worth UGX5,000 (about £1.06) as a token of appreciation for the time spent answering the questions whenever they participate in any activity. This database was selected after carefully reviewing other options, including the Uganda Bureau of Statistics. IGREC was found to be relatively cheap to match the funds available to the researcher, had experience conducting academic research and had worked with reputable research institutions, including universities.

4.3.2. Sampling and sample size

4.3.2.1. Sampling

Sampling involves selecting a portion of study participants from a population of interest for inclusion (Remler & Van Ryzin, 2014). Systematic sampling is a method in which elements are sampled at even intervals; every n^{th} element after a random start was used to select individuals to enrol in the study because of its simplicity (Taherdoost, 2016).

4.3.2.2. The sample size for the quantitative arm

Katharine Kripke et al. (2016) model for Uganda's VMMC programme indicates that the country needs to conduct 6.9 million circumcisions between 2010 and 2020 to achieve 80% coverage. With such a large target, the sample size was determined using the formula below for large populations (Cochran, 1963):

$$n = \frac{Z^2 pq}{e^2}$$

where

n = desired sample size

Z = the abscissa of the normal curve that cuts off an area α at the tails (1 - α equals the desired confidence level, e.g., 95%)

p = estimated prevalence of the desired attribute in the population

q = 1-p

e = the desired level of precision

The Uganda population-based HIV impact assessment of 2016–2017 indicated the prevalence of male circumcision to be 45.4% (p = 0.454) (MOH, 2019); the 95% confidence interval (Z = 1.96) and margin of error (e = 0.05) were used.

$$n = \frac{(1.96)^2(0.454)\,(0.546)}{(0.05)^2}$$

$$n = 381$$

A total sample of 496, which included an additional 30% to cater for incomplete data and nonresponse, was used.

4.3.3. Quantitative data collection tools

A structured questionnaire was used to collect the data. Quantitative data were collected using a structured questionnaire (Appendix D) adapted from a previous study (Mbachu et al., 2018). The purpose of the Mbachu et al. study was to capture information regarding willingness to pay for antiretroviral drugs among HIV and AIDS clients in southeast Nigeria. After carefully reviewing other questionnaires as part of the systematic review, this questionnaire was selected and adapted to suit the current research. The questionnaire was selected because it

was readily available, pre-tested, reliable and valid, and aligned with other current study methods, such as eliciting WTP through the bidding game. The researcher also found it more efficient to use an existing tool instead of developing a new one, thus minimising the research expenses. The adaptations included changing the research subject from antiretroviral therapy to VMMC, changing the geography of the study from Nigeria to Uganda, and changing currency units from Nigerian Naira to Uganda shillings. Section 1 of the questionnaire had nine items that covered the demographic characteristics of the respondents. The respondents were required to choose from the choices provided. For example, marital status could be married, single, divorced, separated or widowed. Section 2 covered knowledge, attitudes, subjective norms, perceived behaviour and beliefs about VMMC, including important attributes such as knowledge on how HIV is spread, attitudes towards circumcision, the influence of other people in making circumcision decisions and the belief that VMMC prevents HIV transmission. Section 3 of the questionnaire covered the willingness-to-pay questions. The section started with a brief statement about what VMMC is, how it prevents HIV infection and how it is currently offered free of charge. Respondents were then asked if they would be willing to pay for VMMC if the free one was no longer available. Different payment options were presented to the respondents using the bidding game approach, and the maximum amount was determined. The last, section 4 of the questionnaire, was about household income and expenditures. The questions were a mixture of open-ended, multiple choice and binary (yes/no) questions, including questions on monthly income, family revenue and average monthly expenditure. In total, the questionnaire had 40 items that required a response.

4.3.4. Recruitment strategy and data collection

The recruitment strategy involves identifying clients eligible for enrolment in the study, explaining the study to the prospective participants and administering the data collection tools until the required sample is attained (Chaudhari et al., 2020). Virtual recruitment of participants was used to minimise the transmission risk of COVID-19 at the time of the study. Data collection was conducted only by IGREC staff to maintain confidentiality. Following a random start, individuals were contacted and invited through telephone calls to participate in the study. Three days after initial contact, all participants who were available and interested in taking the call were given information about the study and invited to join the study. Participants who agreed to join the study were taken through the consent process and asked to provide their consent verbally. The recruitment continued until the required sample size was attained.

4.3.5. Elicitation of willingness to pay

From the systematic review of the literature (Chapter 2), out of the 12 papers that explicitly stated the method used to elicit willingness to pay, the most common approach was the bidding game (7/12), followed by the payment card (5/12). The other methods appeared in only one paper, including multiple price lists, open-ended bidding and structured haggling. The current study used the bidding game because it was the most appropriate method for a questionnaire administered through phone calls.

4.3.6. Quantitative data management

Data were collected virtually using smartphones due to the restrictions of the COVID-19 pandemic. All phones had a password protection system to avoid data leakage if the phone was lost, and all survey information could be removed remotely. Once the study teams completed the daily work, the smartphones were synced with the SurveyCTO® server. This was done using a password-protected server/connection. SurveyCTO® encrypts internet communications with secure sockets layer (SSL) technology, meaning the data is always secure in transit. Once the data were uploaded on the secure SurveyCTO® server, they were exported to the researchers' password-protected computers, and no record of those data was kept on the phones. Only authorised individuals had access to the data. The folders were encrypted using the software Boxcryptor®, ensuring the data is only accessible to those with permission.

4.3.6.1. Quantitative data analysis

The data were managed in Excel and STATA version 17. Duplicates were checked on all variables using Excel while data cleaning; variable generation and modifications were done in STATA. Cleaning involved declaring missing values to eliminate them from analysis and encoding (generating values) string variables, while modifications included recoding variables like age, education and others into appropriate categories to make data fit for analysis. For instance, the education levels for primary and secondary education had several categories collapsed into two groups: primary and secondary. After data cleaning, data distribution was explored using frequencies and percentages since most variables of interest were categorical.

The ability and willingness to pay for voluntary medical male circumcision in Uganda were determined using a data set collected through a closed-ended questionnaire. Two models were proposed following the literature to assess the phenomenon under study. The first model to assess the ability to pay was specified functionally as follows:

ATP = f(AGE, REL, EDUC, EMP, RES, KNO, ATT, SUBN, PBC, BEL) *(1)*

ATP denotes the ability to pay, REL represents religion, EDUC denotes education, EMP denotes employment, RES represents residential setting, KNO represents knowledge, ATT represents an attitude, SUBN denotes subjective norm, PBC represents perceived behaviour and BEL denotes belief.

Table 4.1 Variables, variable names and measurement

Variable	Label	Measurement	Questionnaire
Religion	REL	Closed options	4
Education	EDU	Closed options	5
Employment	EMP	Closed options	6
Residential setting	RES	Closed options	9
Knowledge	KNO	Likert scale and binary	10 to 13
Attitude	ATT	binary	14 to 19
Subjective norms	SUBN	Likert scale	20 and 21
Perceived behaviour control	PBC	Likert scale	22 to 24
Beliefs	BEL	Likert scale	25 and 26

The second model to assess the willingness to pay was specified functionally as follows:

WTP = f(AGE, REL, EDUC, EMP, RES, KNO, ATT, SUBN, PBC, BEL) (2)

where WTP denotes a willingness to pay, and all other variables remain as defined under ATP.

Data analysis started with descriptive statistics, in which the statistical properties of the variables were revealed. A correlational analysis was also conducted to ascertain the associations among the variables. Ordinary least square (OLS) regression and the logit regression model were used to answer the first and second research objectives. These methods were used because they have been used in other similar studies. As presented in Chapter 2, 74% (14/19) of the studies included in the systematic review that mentioned the statistical analysis method, used ordinary least squares and logistic regression.

The ability to pay for voluntary medical male circumcision was measured by ordinary least squares using the data collected. OLS indicated the precise direction of the relationship, while the coefficient showed how much each independent variable had affected the dependent variable. The model estimated for the OLS is specified econometrically as follows:

$$ATP_i = \alpha_0 + \beta_1 AGE_i + \beta_2 REL_i + \beta_3 EDUC_i + \beta_4 EMP_i + \beta_5 RES_i + \beta_6 KNO_i + \beta_7 ATT_i + \beta_8 SUBN_i + \beta_9 PBC_i + \beta_{10} BEL_i + \varepsilon \quad (3)$$

where α_0 represents the intercept, β_1 to β_10 denote the coefficient of the independent variables, and ε represents the error term. All other variables remain as previously defined.

Dichotomous outcome variables were modelled using logistic regression, a logit model. The log odds of the results were modelled in the logit model as a linear combination of explanatory factors. The dependent variable in the willingness to pay for circumcision was a binary variable

in which the response was coded as 1 for yes and 0 otherwise. The logistic regression test is specified as follows:

$$WTP_i = \propto_0 + \beta_1 AGE_i + \beta_2 REL_i + \beta_3 EDUC_i + \beta_4 EMP_i + \beta_5 RES_i + \beta_6 KNO_i + \beta_7 ATT_i + \beta_8 SUBN_i + \beta_9 PBC_i + \beta_{10} BEL_i \quad (4)$$

where ∝_0 represents the intercept, and β_1 to β_10 denote the coefficient of the independent variables. All other variables remain as defined.

Post-estimation test

Predicted probabilities

All the variables of interest that had a significant effect (with a p-value of 0.1) on the ability to pay and willingness to pay were used for the predicted probabilities to give more insight into the model. The findings are presented graphically.

Multicollinearity

High intercorrelations between two or more independent or explanatory variables in a multiple regression model are referred to as multicollinearity (Daoud, 2017). When a researcher or analyst tries to determine how well each independent variable can be utilised to predict or comprehend the dependent variable in a statistical model, multicollinearity can cause the results to be skewed or misleading conclusions (Daoud, 2017).

In general, multicollinearity can widen confidence intervals, which might result in less trustworthy probabilities when predicting the impact of independent variables in a model. Multicollinearity can cause analysts to make unfounded assumptions. This typically happens due to analysing a phenomenon using many variables of the same kind.

The degree of collinearity in a multiple regression model can be determined and measured using a statistical method known as the variance inflation factor (VIF). The variance of the calculated regression coefficients is inflated compared to when the predictor variables are not linearly connected, and VIF quantifies this. A VIF of 1 indicates no correlation between the variables, a VIF between 1 and 5 indicates a moderate correlation, and a VIF between 5 and 10 indicates a strong correlation between the variables (Daoud, 2017).

Marital status was included first in the model for the ability to pay, and the willingness to pay, but the VIF coefficient of marital status was above 10, which led to dropping the variable from the two models.

4.4. Qualitative approach

4.4.1. Sampling and sample size

Qualitative enquiry is about gaining more profound knowledge of an issue to create extensive and informative data, and it allows researchers to investigate the context and factors that influence behaviour (Queirós et al., 2017). The main aim of the qualitative component of the current research was to obtain in-depth information about the reasons that inform choices regarding willingness to pay for VMMC, as identified from the quantitative analysis.

Qualitative research is not generalisable and thus has smaller sample sizes than quantitative research. Braun and Clarke (2013) recommend a minimum of six interviews; however, the sample size depends on the methods and purpose of the research. For studies such as the current one, where varied responses are anticipated to be obtained, a sample of 15 to 30 interview participants is recommended (Braun & Clarke, 2019; Marshall et al., 2013).

Participants were randomly contacted and invited to join the study from the same database used for the study's quantitative arm, as described in **Section 4.3.1.** The study enrolled males aged at least 18 and not more than 65 until theoretical saturation was achieved (Boddy, 2016).

4.4.2. Qualitative data collection instruments

The third objective of the current research was to explore the reasons that inform willingness to pay for VMMC. Grounded theory, one of the primary methods for qualitative data collection, was used. It involves gaining a deeper understanding of something less well understood by interacting with people who know about the phenomenon through focus group discussions or interviews (Sutton & Austin, 2015).

Interviews were preferred over focus group discussions for the following reasons. First, interviewing was used because the willingness to pay or not to pay is an individual matter and not a group matter. Second, adult male circumcision is essentially a private matter that is best explored at the individual level and not in a group to avoid intimidation, shyness and domineering by some individuals, which could all occur in a focus group discussion (Bowling, 2014). Additionally, data collection was conducted at a time when COVID-19 restrictions could not permit in-person focus group discussion, and it was not only deemed expensive to apply but also had the possibility of not resulting in a meaningful focus group discussion if respondents had to maintain physical distancing (Lobe et al., 2020). Finally, focus group discussions were deemed time-consuming and not superior to individual in-depth interviews for the current research (Tausch & Menold, 2016).

Three broad types of interviews are structured, unstructured and semi-structured (Bowling, 2014). Structured interviews involve the use of a predefined set of questions and responses.

The respondent must choose from the available list of reactions (Bowling, 2014). Whereas structured interviews are quick to administer and analyse, they limit information and do not offer in-depth interviewing (Bowling, 2014). Unstructured interviews, on the other hand, offer much freedom to the respondents. There is neither a predefined list of questions nor predefined responses (Bowling, 2014). The main advantage of unstructured interviews is that they do not limit respondents. Unstructured interviews can be challenging to control and may end up straying away from the research topic (Bowling, 2014). As a middle ground, semi-structured interviews use a preconceived list of topical questions to guide the discussion, thus addressing one of the significant limitations of unstructured interviews. Semi-structured interviews do not rely on preconceived responses. They, therefore, allow one to probe in-depth into a narrow question to fully understand the underlying meanings and motivations that inform people's decision-making, thus addressing one of the gaps of structured interviews. Owing to the stated advantages, semi-structured interviewing was preferred for the current study. Further, semi-structured in-depth interviewing that enables participants to respond to the same questions was used because it is recommended to investigate opinions and reasons underlying behaviours and accounts of personal experience, which aligns with the current study's third objective (Remler & Van Ryzin, 2014). The in-depth, semi-structured interview guide (Appendix E) used in the present study was informed by the literature on willingness to pay and the preliminary findings from the study's quantitative arm. It was anchored in the theory of planned behaviour, structured across five main themes: 1) attitude about VMMC, 2) willingness to pay for VMMC, 3) ability to pay, 4) perceived behaviour control and 5) subjective norms.

4.4.3. Qualitative data collection

Data collection was conducted virtually through phone call interviews to minimise the risk of COVID-19 transmission. At the initial contact, participants randomly selected from the IGREC database were given information about the study and were allowed three days to consider joining. The information given included informing the prospective Respondent that the lead researcher was a PhD student at Lancaster University and that the research was part of an academic process. Still, at the first contact, they were informed that they would have to be in a quiet place that accorded them privacy to complete the interview. An appointment would then be scheduled after a minimum of three days. On the third day or after that, depending on the participant's availability, they were contacted again at the agreed-upon time and, if still interested, were taken through the process of obtaining and documenting informed consent, followed by the interview. The interviews were conducted in the language best understood by the respondents. Each participant was sequentially assigned a unique identification number, starting with P#01. The discussions were tape-recorded, and the recording only started after the participant and interviewer had introduced themselves to avoid collecting personally identifiable information. The interviews were conducted by data collectors experienced in virtual data collection, conducting in-depth interviews and fully trained in the tool. The lead researcher fully participated in the qualitative data collection and regularly reviewed the recordings to identify emerging discussion points and determine when to end data collection from new Respondents. Interviews captured in local languages were translated into English by professional translators. To check for accuracy, one transcript for each regional language was back-translated and re-checked for accuracy. All recordings were transcribed manually, as

opposed to electronic transcription. After transcription, the recording was permanently deleted from the voice recorder.

4.4.4. Qualitative data analysis

The current study's third objective was to determine the reasons that inform willingness to pay or not for VMMC services in Uganda. An inductive approach was used to conduct a thematic analysis (Braun & Clarke, 2019). Thematic analysis was used because of its academic freedom of allowing researchers from diverse disciplines, including health economics, to engage with it (Braun & Clarke, 2019). The flexibility of inductive thematic analysis also aligns with the pragmatic philosophical approach that underpins the current study. Reflexive thematic analysis, described as big Q reflexive thematic analysis by (Braun & Clarke, 2019, 2023), allows more engagement with the data and was conducted iteratively, initially manually and then electronically, as described below.

Data analysis and collection occurred iteratively (Bowling, 2014). The researcher listened to the recordings to identify emerging topics in the interviews. In addition to the reading that was done during transcription, the transcripts were read several times before and after importation into QSR NVivo® curiously and analytically to gain insight into and become intimately familiar with the collected data (Braun & Clarke, 2019). The first reading was done with an open mind to get a general feel and appreciate the richness of the data. In the second reading round, segments of data relevant to the study objective were highlighted by underlining them using a pencil, including the language used and emotions such as laughter. At the end of this phase, the researcher felt more familiar with and knew the data better.

Coding, which involves capturing key analytic ideas within the data related to the research question, was done manually during the familiarisation stage and electronically using QSR NVivo®, which resulted in the generation of initial codes. During coding, common data patterns (Braun & Clarke, 2012) that addressed the same issue about the research question were highlighted with different colours. This involved moving beyond the obvious meaning of the data and identifying the analytical meaning related to the research question. For example, portions of data about the benefits of circumcision were highlighted using the same colour, and those about the disadvantages of circumcision were highlighted using another colour. A two-stage process was used to ensure that no codes were missed, and that the codes were mutually exclusive to ensure that each data unit was coded under only one category (Bowling, 2014). The initial codes were used to find semantic or latent pieces of the data that seemed interesting and relevant to the research questions. The initial set of codes reflected the most basic data that could be evaluated effectively (Braun & Clarke, 2021) on the factors influencing the willingness to pay for VMMC. Coding continued until all the data were exhausted and the researcher felt that there were no new codes to be assigned.

The next phase involved moving away from the particular codes to narrow the analysis to a higher level of categories and sub-themes by combining related distinct codes into compositions (Braun & Clarke, 2022, 2023). Memos describing each sub-theme's meaning and function were used to record the categorisation process. The validity and reliability of the interpretations were assured by including quotations from respondents taken from the transcripts and used under the appropriate subthemes (Braun & Clarke, 2021). Iterative sorting and categorising subthemes yielded preliminary descriptive themes, while leaving room for generating other codes and themes. The process of thematic revision sometimes resulted in

the consolidation, separation, transformation, dropping of vague codes, revising those that did not make sense and omitting some subthemes.

After creating descriptive sub-themes, the next step in the analysis involved defining the meaning and deciding what data component each sub-theme represented to develop analytical themes (Braun & Clarke, 2019). During this phase, several sub-themes were combined or split as appropriate to generate the final themes that were analytical, useful and accurate data representations (Braun & Clarke, 2012). The analytical themes were given succinct and straightforward names to give the reader an initial understanding of the topic (Clarke et al., 2015). Relationship diagrams were used to display the linkage between the codes and the subthemes.

The final phase of the analysis involved drafting a report containing the study's results. The objective of this phase was to convey the findings within and across themes in a succinct, cohesive, logical, nonrepetitive and engaging way. Additionally, excerpts of quotes were incorporated into an analytical narrative to demonstrate the data that had been examined and the findings that had been drawn from the research (Braun & Clarke, 2012).

4.5. Interpretation of the study findings

The current study uses a mixed-methods approach with triangulation of quantitative and qualitative methods to enrich learning. Triangulation combines methodologies to study the same phenomenon (Pitre & Kushner, 2015). Denzin (2017) states that triangulation can be applied at various stages of the same study, including at the investigator, study design, data collection, data analysis and interpretation of study findings levels. The objectives of the study determine the level at which triangulation occurs. In the current study, I apply triangulation at

all levels, from conception to interpretation of findings. The findings from the study's quantitative and qualitative arms were triangulated and interpreted to answer the research questions. The findings were interpreted in the context of the existing literature on willingness to pay for HIV prevention services discussed in Chapter 7 of the thesis.

4.6. Ethical approval

Ethical approval to conduct the study was obtained from the Faculty of Health and Medicine Research Ethics Committee (FHMREC) at the University of Lancaster (Approval number: FHMREC20119). In-country ethical approval was obtained from the Mildmay Uganda Research and Ethics Committee (Approval number: MUREC-2021-50). The Uganda National Council for Science and Technology (Approval number: HS1523ES) gave regulatory approval to conduct the study in Uganda. The study approval documents are shown in Appendix F. All data related to this study were and will continue to be managed as per the Data Protection Act 2018 and the GDPR principles (Regulation, 2018).

4.7. Chapter summary

Chapter 4 presents the research methodology. Having identified from Chapter 3 the importance of mixed methods to answer the research questions, Chapter 4 presents the study design for the current research. Specifically, the quantitative and qualitative methods required to meet the objectives were presented, including the study population, sample size, sampling methods, quantitative and qualitative data analysis and a description of how the study findings were interpreted. The ethical concepts of the current study are also covered in this chapter. The following two chapters, 5 and 6, cover the study's results based on the methods described in the current chapter.

5. QUANTITATIVE RESULTS

5.1. Introduction

The current chapter presents the findings from the quantitative component of the study. The findings are presented, starting with the descriptive statistics of the participants, followed by the findings for each of the two objectives. The quantitative component of the study aimed to answer the first two objectives:

1. To identify the factors that determine the ability to pay for voluntary medical male circumcision in Uganda
2. To determine the factors associated with the willingness to pay for voluntary medical male circumcision services in Uganda

5.2. Sociodemographic characteristics of the respondents

The statistical properties of the variables that served as the confounding variables and gave insight into the circumcision phenomenon are presented in tables. Variables with categorical data are shown in Table 5.1 (Items 2, 3, 4, 5, 6, and 9 of the questionnaire), while variables with continuous data are presented in Table 5.2 (Items 1, 37 and 38 in the questionnaire). The findings align with the general population.

Table 5.1 Descriptive statistics of categorical variables

Variables	Freq.	Percentage	Cum.
Marital status			
Divorced	2	0.44	0.44
Married / Cohabiting	408	89.87	90.31
Single	44	9.69	100.00
Total	454	100.00	
Religion			
Christian	387	85.24	85.24
Muslim	66	14.54	99.78
Unknown	1	0.22	100.00
Total	454	100.00	
Education			
Degree/Diploma	56	12.33	12.33
College/Tertiary	33	7.27	19.60
Secondary	187	41.19	60.79
Primary	159	35.02	95.81
No formal education	19	4.19	100.00
Total	454	100.00	
Employment			
Paid employment	73	16.08	16.08
Self-employed	365	80.40	96.48
Unemployed	16	3.52	100.00
Total	454	100.00	
Residential setting			
Urban	207	45.59	45.59
Village	247	54.41	100.00
Total	454	100.00	
Traditional circumcision			
No	431	94.93	94.93
Yes	23	5.07	100.00
Total	454	100.00	

Source: Author's compilation using STATA 17

Table 5.1 shows that married or cohabiting people formed a larger percentage of the study's sample. Over half of the respondents were Christians, and most had formal education. Most respondents (80.4%) were self-employed, while only a few were unemployed. The category of unemployed also included respondents who were full-time students. There was a balanced representation regarding the residential setting, with the urban and village residential areas

well represented in the study. Over 90% of the respondents did not belong to a tribe that performs traditional circumcision.

Table 5.2 Descriptive statistics of continuous variables

Variable	Obs	Mean	Std. dev.	Min	Max
Age	454	43	12	18	64
Monthly expenditure	454	281,545	520,429	0	6,000,0000
Personal revenue	453	435,636	695,707	0	8,000,0000

Source: Author's compilation using STATA 17

Table 5.2 illustrates that the respondents were aged between 18 and 64, with an average of 43 years, while the monthly expenditure and personal revenue had a minimum value of zero, with a maximum monthly expenditure and personal revenue of Uganda shillings (UGX) of UGX6,000,000 (£1,266) and UGX8,000,000 (£1,688), respectively.

5.3. Personal revenue of respondents

Figure 5.1 which is based on item 37 of the questionnaire shows the personal revenue of the respondents. It shows that most of the respondents have a revenue of more than UGX85,000 (£17.90), with only 15% earning less than this amount.

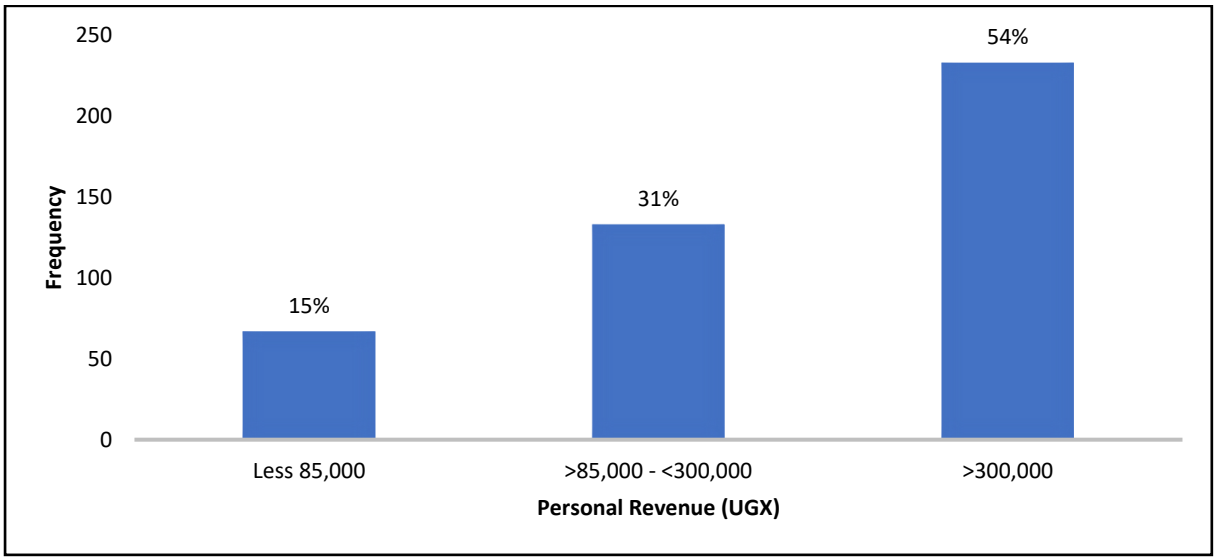

Figure 5.1 Personal revenue of respondents

5.4. Willingness to pay for VMMC

Respondents were presented with the following statement: *VMMC is currently offered free of charge as one of the main methods for the prevention of HIV. If the free VMMC was no longer available and you were asked to pay for it, would you be willing to pay?* Figure 5.2 (from item 27 of the questionnaire) shows the proportion of respondents who were willing to pay for VMMC.

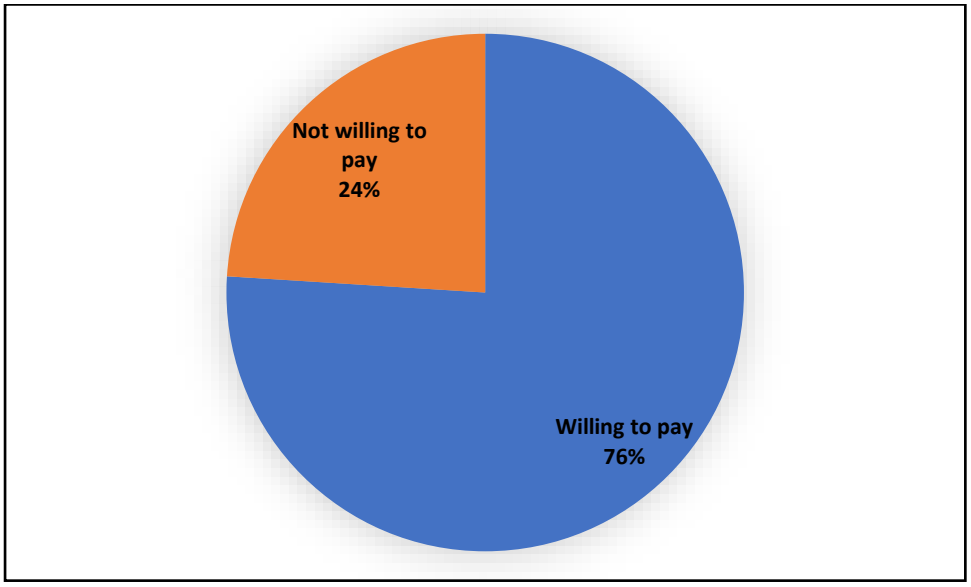

Figure 5.2 Proportion of respondents willing to pay for VMMC

Furthermore, the respondents who reported an unwillingness to pay for VMMC were presented with various options to select from the reasons for their unwillingness to pay for VMMC. The findings are shown in Figure 5.3 (from item 28 of the questionnaire).

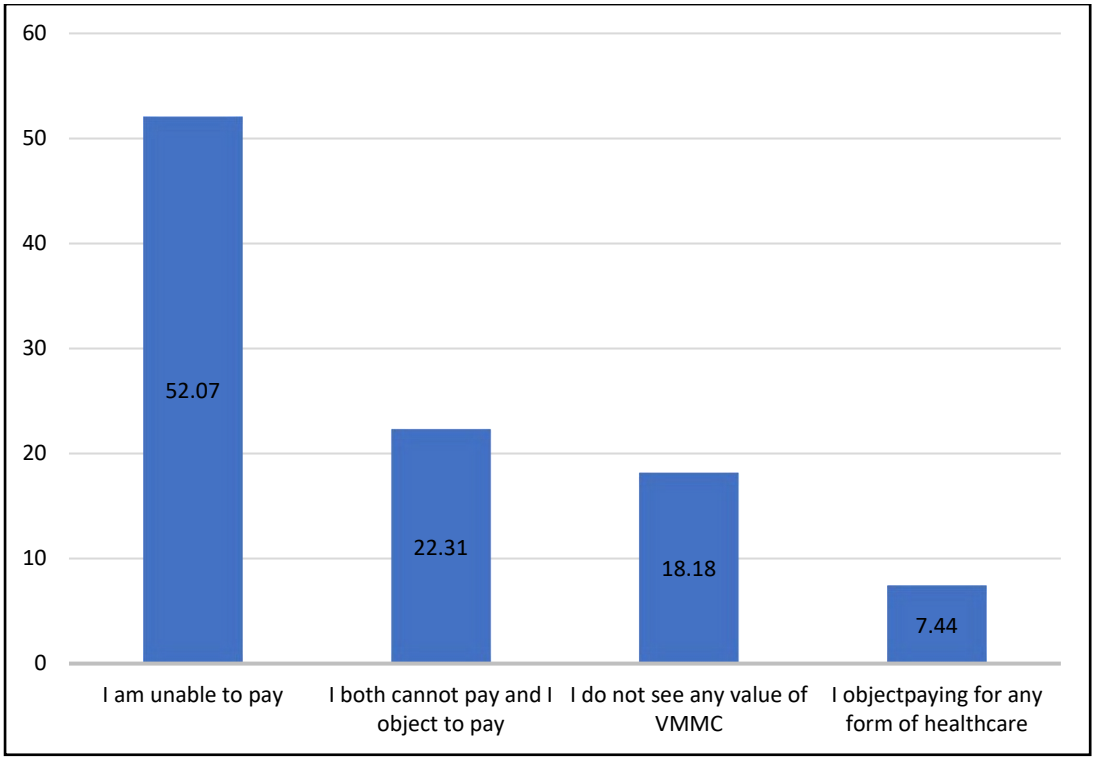

Figure 5.3 A bar graph showing the percentage of reasons people are unwilling to pay for VMMC

Considering their other financial obligations, the respondents were asked to state the final maximum amount they would be willing to pay for VMMC. The findings are shown in Figure 5.4 (from item 34 of the questionnaire). A negatively sloped demand curve was revealed, with the number of people WTP diminishing drastically as the price increased. Most respondents (88%, 326/371) were willing to pay less than UGX100,000 (£21.10), with a few willing to pay UGX200,000 (£42.20) or more for the procedure.

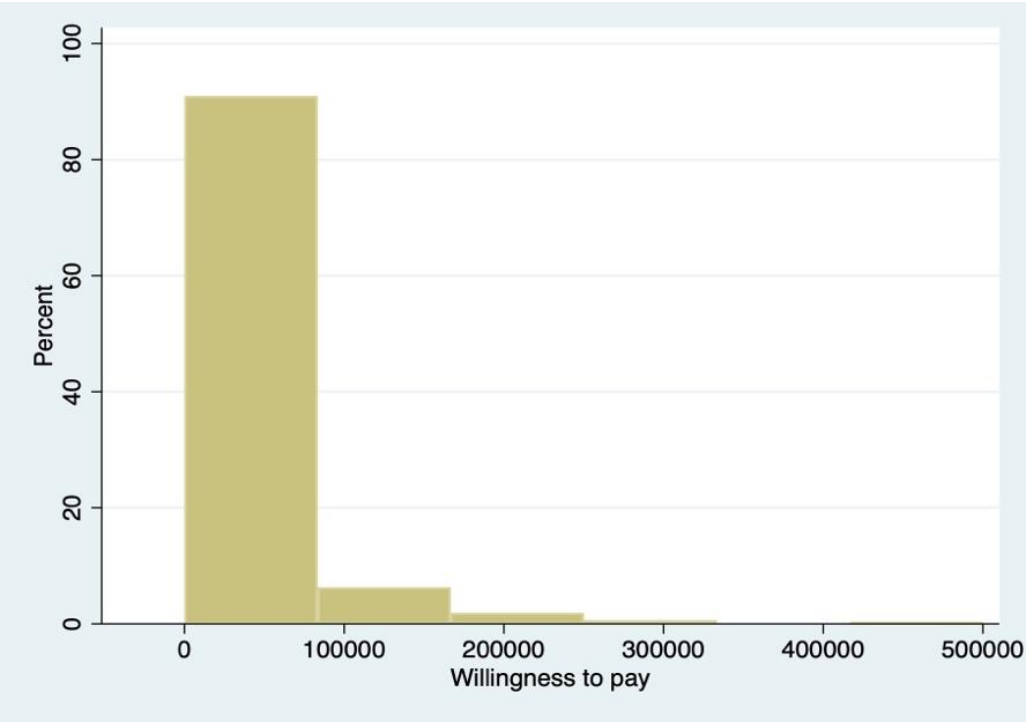

Figure 5.4 Maximum amount of willingness to pay (Uganda Shillings) for VMMC

Figure 5.5 shows the income elasticity of demand for VMMC. This shows how the demand for VMMC varies with the respondent's income. The figure is constructed using data from items 27 (those who responded yes) and 37 of the questionnaire. The vertical axis is the percentage of people in each income range who are willing to pay for VMMC. The horizontal axis shows the income of the respondents. The curve shows a generally increasing WTP for VMMC as personal revenue increases.

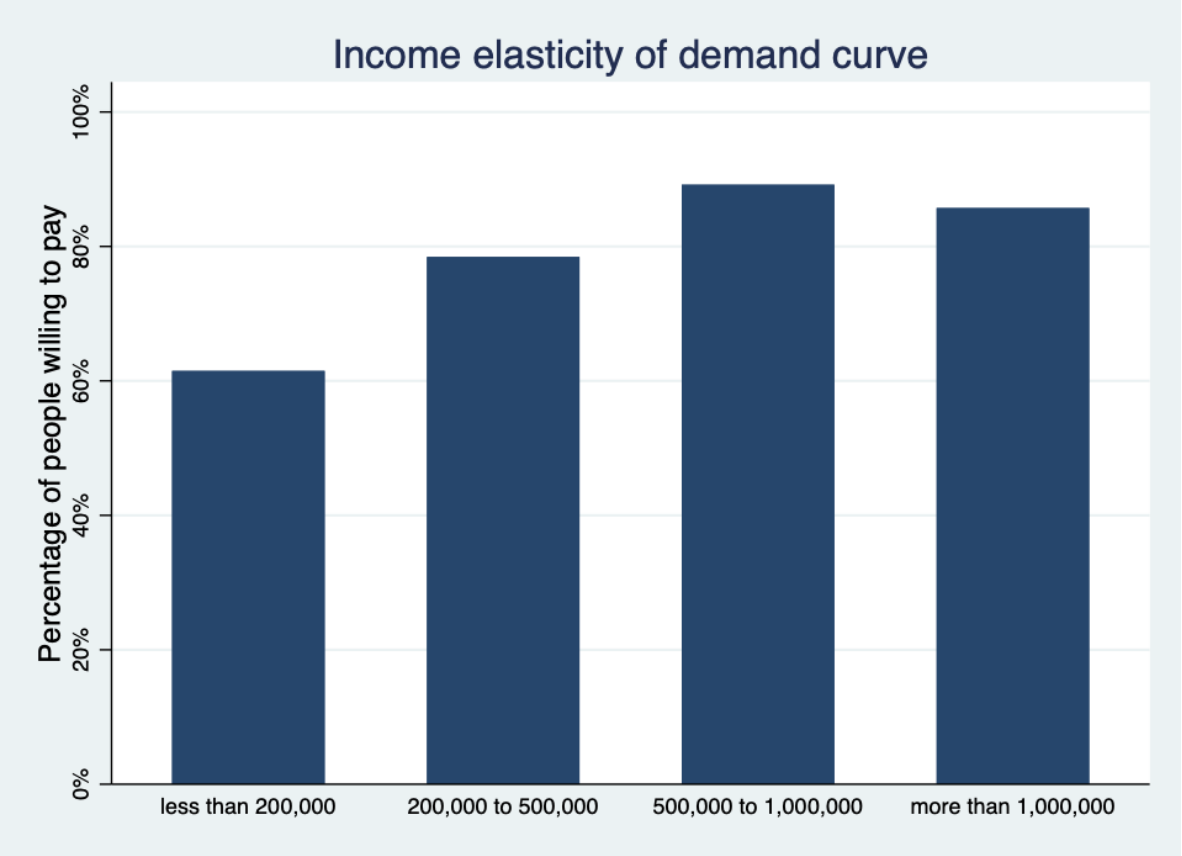

Figure 5.5 Income (Uganda shillings) elasticity of demand curve for VMMC

Correlational analysis

Correlational analysis assesses the strength and direction of a linear relationship between the two variables of interest (Schober et al., 2018). The first correlation matrix presented in Table 5.3 shows the correlation between the confounding variables used in this study. The second correlation matrix in Table 5.4 presents the association between the level construct of ability and willingness to pay.

Table 5.3 Pairwise correlation matrix of confounding variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) Age	1.000					
(2) Marital status	-0.379*	1.000				
(3) Religion	0.011	-0.044	1.000			
(4) Education	-0.058	0.092	0.021	1.000		
(5) Employment	0.115*	0.124*	-0.010	0.167*	1.000	
(6) Residential setting	0.123*	-0.099*	-0.153*	0.064	0.083	1.000

Statistically significant at 10% level; ** at 5% level; * at 1% level.*

Source: Author's compilation using STATA 17

Table 5.3 shows that the level of correlation among the variables that served as the control variables in the study was within the acceptable level of below 0.80. According to Kumari (2008) a pairwise correlation value higher than 0.80 can result in multicollinearity. This can challenge the model, as it increases the standard error of the coefficients.

Multivariate analysis

Personal income was used to determine one's ability to pay. The first, second and third quintiles of personal revenue were created by generating a new variable of percentiles of personal revenues, with mean incomes of UGX83,900 (£17.70), UGX285,300 (£60.20) and UGX1,058,900 (£223.43) in the first, second and third quintiles, respectively. Given that the VMMC costs, on average, UGX100,000 (£21.10), it was assumed that everyone in the second and third quintiles had the ability to pay for VMMC. An ordinary least squares logistic regression model was used since the first and second objectives were measured using binary outcomes.

Table 5.4 Pairwise correlation matrix of ability to pay and willingness to pay for VMMC

Variables	(1)	(2)	(3)	(4)	(5)
(1) VMMC_WTP	1.000				
(2) Quintiles of ATP	0.198*	1.000			
(3) Personal Revenue	0.075	0.421*	1.000		
(4) Transport to clinic	-0.144*	-0.197*	-0.080	1.000	
(5) Monthly Expenditure	0.013	0.382*	0.812*	-0.083	1.000

Statistically significant at 10% level; ** at 5% level; * at 1% level.*
Source: Author's compilation using STATA 17

Table 5.4 presents the correlation matrix showing an association between the willingness to pay for circumcision and the construct of the ability to pay for male circumcision in Uganda. The quintiles of ATP and personal revenue are positively associated with willingness to pay, but

only the former is significant. The cost of reaching their nearest VMMC service point has a significant inverse association with willingness to pay. The monthly expenditure also had a positive association with the ability to pay.

5.5. Factors that determine the ability to pay for VMMC

The study's first objective was to identify the factors determining the ability to pay for voluntary medical male circumcision in Uganda. The ordinary regression test was conducted to achieve the first study objective, and the findings are presented in Table 5.5.

Table 5.5 Factors that determine the ability to pay for VMMC

Variable	Model 1	Std. err 1	Model 2	Std. err 2
Age	10,595.37**	-4,695.00	8,605.19*	-4,854.07
Irreligious/Atheist	3,403,921.13***	-1,089,171.38	3,450,242.96***	-1,089,671.34
Muslim	179,658.09	-146,670.22	154,057.74	-158,670.27
Degree/Diploma	527,825.29**	-240,861.17	597,527.24**	-242,476.72
Secondary school	-439,585.91**	-206,234.28	-435,400.82**	-206,126.63
Primary school	-408,811.08*	-210,950.98	-421,192.36**	-212,238.26
No formal education	-745,503.56**	-315,106.23	-772,310.67**	-315,358.48
Self-employed	106,516.96	-146,894.95	106,201.10	-147,427.10
Unemployed	-430,851.66	-300,099.06	-489,178.93	-303,898.65
Rural	-323,503.87***	-109,945.75	-300,366.61***	-112,190.47
Knowledge			-8,517.55	-21,196.45
Attitude			-4,206.46	-19,966.54
Subjective norms			-28,540.83	-25,429.26
Perceived behaviour control (PBC)			-44,785.05*	-24,829.86
Beliefs			-32,687.28	-23,029.26
Constant	634,486.76**	-277,679.04	1,462,213.18***	-398,425.04
Observations	454		454	
R-squared	0.15		0.17	

Statistically significant at 10% level; ** at 5% level; * at 1% level.*

Source: Author's compilation using STATA 17

The Model 1 column presents the dependent variable with the control variables, while the Model 2 column has the variables of interest added to the dependent variable. In model 1, age was positively related to the ability to pay for circumcision. It has been revealed that as age increases, the ability to pay for circumcision increases by UGX10,595 (£2.24). Irreligion or atheism also has a positive effect on the ability to pay. Compared to Christianity, which served as the reference group, the ability to pay for circumcision increased drastically amongst people with no religion. College and tertiary levels served as the reference group. Individuals with a degree or diploma have a higher ability to pay for circumcision, with about UGX527,852 (£111.38) compared to those with only college. Those without formal education have a negative relationship with ATP, which indicates a decline in the ability to pay compared to those who attended college by UGX745,503 (£157.30). Individuals with primary and secondary education also have a decrease in their ability to pay compared to those who attend college, but the decline is not as high as those without formal education. The former decreases by UGX408,811 (£86.26), while the latter drops by UGX439,585 (£92.75). The residential setting in which an individual resides is also a significant determinant of the ability to pay. The findings revealed that the ability to pay for those who inhabit the rural area declines compared to those who stay in the urban area by UGX323,503 (£68.26).

In Model 2, the variables of interest were added to the control variables to determine the ability to pay for circumcision. All the control variables in Model 1 remained significant and maintained the same direction of relationship with the ability to pay for circumcision. With all the variables added to the control variables, only perceived behaviour control significantly impacts the ability to pay, and the relationship is negative. This revealed that as the level of perceived behaviour changes, the ability to pay for circumcision declines by UGX44,785

(£9.36). All other variables in the model—knowledge, attitude, subjective norms and belief—have a negative effect on the ability to pay, but they do not have economic significance.

The predicted margin for perceived behaviour control is the only significant variable in the ability-to-pay model. As shown in Figure 5.6, the ability to pay for circumcision declined with the rise of perceived behavioural control. For an individual with PBC at 2, their ability to pay stands at UGX985,590 (£207.96), while the predicted PBC level of 14 pays UGX448,170 (£94.56).

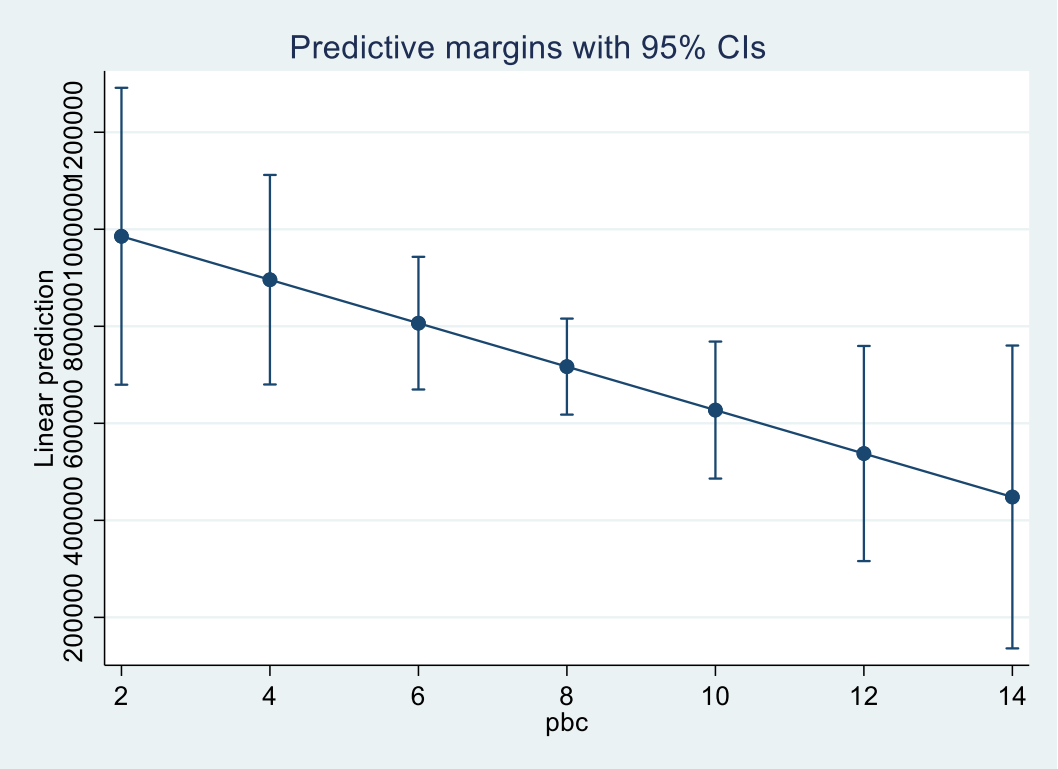

Figure 5.6 Predicted margins of PBC for ability to pay (Uganda shillings)

Source: Author's compilation using STATA 17

5.6. Factors associated with the willingness to pay for VMMC

The logit regression model assessed the willingness to pay for voluntary medical male circumcision in Uganda. The log-likelihood value (–226.0049) showed that the model

converged quickly. The likelihood ratio chi-square and the p-value of 38.52 and 0.0001, respectively, revealed that the model fits significantly and is much better than a model with no predictors.

Table 5.6 Factors determining willingness to pay for VMMC

Variable	Model 1	Std. err 1	Model 2	Std. err 2
Age	-0.01	-0.01	-0.01	-0.01
Muslims	1.45***	-0.5	0.96*	-0.53
Degree/Diploma	0.09	-0.61	0.14	-0.63
No formal education	-1.38**	-0.68	-1.32*	-0.7
Primary	-0.29	-0.51	-0.32	-0.53
Secondary	-0.34	-0.5	-0.2	-0.51
Self-employed	-0.05	-0.36	0.25	-0.38
Unemployed	-0.62	-0.65	-0.04	-0.68
Rural	-0.74***	-0.26	-0.47*	-0.28
Knowledge			0.09*	-0.05
Attitude			0.07	-0.05
Subjective norms			0.09	-0.06
PBC			-0.26***	-0.06
Belief			0.08	-0.05
Constant	2.34***	-0.68	2.08**	-0.94
Observations	453		453	

Statistically significant at 10% level; ** at 5% level; * at 1% level.*

Source: Author's compilation using STATA 17

As presented in Table 5.6, Model 1 shows the first regression test, in which the control variables alone were the only independent variables. The findings revealed that being a Muslim compared to being a Christian increased the willingness to pay by 1.45. In considering the educational level, males that have no formal education compared to those maintaining a level of education status of college or tertiary education decrease the odds of willingness to pay for circumcision by 1.38. The last variable considered is the residential setting, which is highly statistically significant. This indicates that residing in rural areas, compared to urban areas, decreases the odds of willingness to pay for circumcision by 0.74.

Model 2 in Table 5.6 has the variables of interest added to the control variables used in the first model. All the significant variables in Model 1, containing control variables alone, are still significant, but the coefficients' sizes decline. A similar reduction pattern also occurred with the individual's education level. One of the types of religion (Muslim) as a categorical variable is significant, and Christianity served as the reference. The results showed that being a Muslim in terms of religion enhances one's willingness to spend by 0.96. In addition, having no education compared to college or tertiary education and residing in a rural region compared to an urban region leads to a decline of 1.32 and 0.47, respectively. The first independent variable is knowledge, which has a significant positive relationship with willingness to pay. For every unit change in knowledge, the log odds of willingness to pay for circumcision versus non-willingness to pay increased by 0.09. The results further revealed that perceived behaviour control is inverse to the dependent variable. The results showed that for every unit increase in perceived behaviour control, the log odds of willingness to pay for circumcision versus non-willingness to pay decreased by 0.26. As noted in the results, the attitudes, subjective norms and beliefs of males do not significantly influence their willingness to pay for circumcision.

The predicted probabilities of the significant variables were estimated to help us understand the model further. This estimation is based on the assumption that all other variables are held at their means. As presented in Figure 5.7, the predicted margin provides insight into the probability of engaging in circumcision based on an individual's willingness to pay with a level of knowledge of three is 0.67. The predicted probability of willingness to pay for circumcision increases to 0.814 for an individual with a knowledge level of 13.

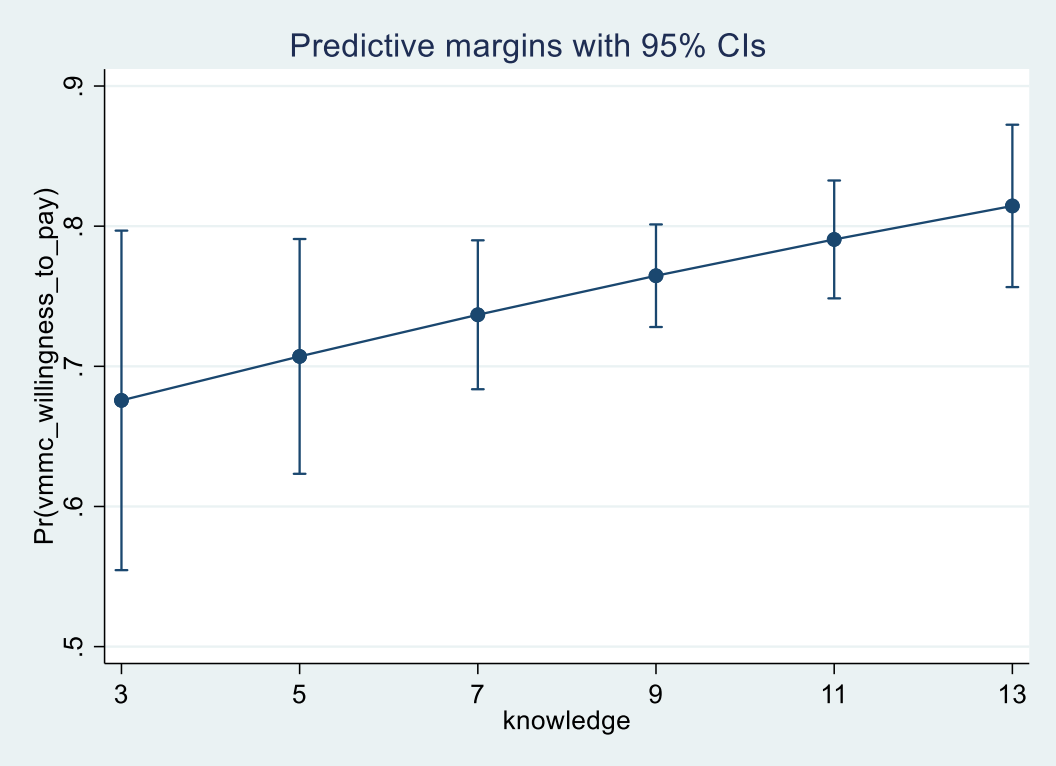

Figure 5.7 Predicted margins of knowledge for willingness to pay

Source: Author's compilation using STATA 17

The individual's PBC was also significant in the variable of interest. The predicted probability of PBC in willingness to pay was estimated. As shown in Figure 5.8, individuals maintaining the lowest level of PBC (level two) have a 0.95 willingness to pay. It keeps decreasing as the PBC increases. The PBC of those with a PBC level of 14, which is the highest, has a willingness to pay 0.45.

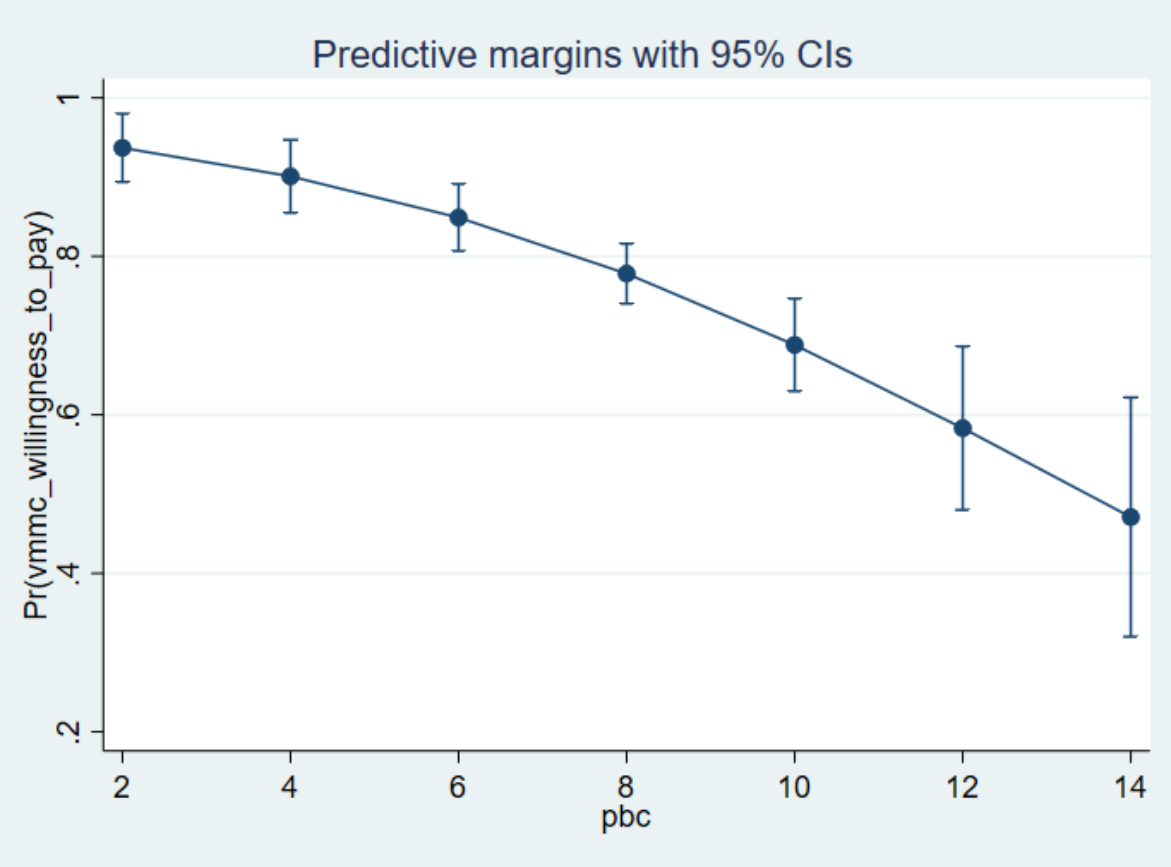

Figure 5.8 Predicted margins of PBC for willingness to pay

Source: Author's compilation using STATA 17

5.7. Post-estimation test

Multicollinearity test

Multicollinearity addresses cases in which the independent variables of the multiple regression test's independent variables exhibit high linear relations. This demonstrates that the independent feature of the explanatory variables violates the linear and logistic regression assumptions. In addition, even if it is a peradventure, the model will occasionally provide high accuracy without completely dealing with or eradicating multicollinearity; it cannot be trusted with actual real-world data. Moreover, the coefficients become extremely sensitive to even minor model modifications. Simply put, if the model is used in a real-world context, it will not

be able to generalise the outcome and possibly lead to catastrophic failure. Eliminating multicollinearity from the dataset can also help to get closer to the "ideal" model by lowering the model's development and computing costs. The variance inflation factors (VIF) have a rule of thumb: the variables are not correlated if they are 1. A value between 1 and 5 indicates that they are moderately correlated, while a value greater than 5 suggests a high correlation. The VIF of the model, as presented in Table 5.7, is less than 5, and thus the model does not suffer from multicollinearity.

Table 5.7 Variance inflation factor

	VIF	1/VIF
Age	1.222	0.818
Religion	1.03	0.97
Muslim	1.235	0.81
Degree/Diploma	2.51	0.398
No formal education	1.575	0.635
Primary school	4.047	0.247
Secondary school	4.064	0.246
Self-employed	1.353	0.739
Unemployed	1.24	0.807
Rural	1.233	0.811
Knowledge	1.415	0.706
Attitude	1.103	0.907
Subjective norms	1.262	0.793
PBC	1.389	0.72
Belief	1.122	0.892
Mean VIF	1.72	.

Source: Author's compilation using STATA 17

5.8. Chapter summary

The current chapter presents the quantitative results of the study. The findings indicate that 454 records were included in the final analysis. The average age of the respondents was 43 years. Most of the respondents were married (89.9%), Christian (85.2%), self-employed (80.4%), had some formal education and did not belong to a traditionally circumcising

community (95%). Overall, the results indicate that most respondents (76%) reported willingness to pay for VMMC with an average maximum WTP of UGX32,379 (£6.83). The increasing age of the respondent, having no religion, possessing a degree or diploma were positively associated with the ability to pay, while having no formal and or primary level education, residing in a rural area and perceived behaviour control (a person's self-assessment to perform the expected behaviour) were negatively associated with the ability to pay for VMMC. Being a Muslim and having knowledge about VMMC was positively associated with willingness to pay for VMMC, while having no formal education, residing in a rural area and perceived behaviour control were negatively associated with willingness to pay for VMMC. The current chapter notes the ability and willingness to pay for VMMC. Additionally, knowledge about VMMC was identified as a factor that positively influences WTP, while high perceived behaviour control decreases willingness to pay for VMMC. These factors were further investigated qualitatively to understand how they influence WTP, and the findings from the qualitative arm of the study are presented in Chapter 6, which follows hereafter.

6. QUALITATIVE RESULTS

6.1. Introduction

The purpose of Chapter 6 is to present the findings of the qualitative part of the study. The results presented in this section specifically answer the study's third objective: to determine the reasons that inform the willingness to pay or not to pay for VMMC services in Uganda.

6.2. Characteristics of respondents

A total of 29 interviews were conducted. The respondents were adult males between 18 and 39 years old (average age 28). Of these, 19 were single, 7 were married, and 3 were separated. Eighteen were either urban or peri-urban dwellers, while 11 lived in rural areas. Two respondents had no formal education, seven had attended primary school, 12 had secondary school, and eight had tertiary-level education. The characteristics of the respondents are presented in *Appendix G*. Direct quotes from the interviews with the respondents are included in the results; for this, there may be grammatical errors in the excerpts, but these were left to show what the respondents said. Where a respondent used an abbreviation, the full version of the word is indicated in square brackets. Additionally, where keywords were represented by articles such as "it", "this", and "them", the actual referenced word is included in square brackets. The findings are presented below.

6.3. Analytical themes

From the thematic analysis, five major themes were created as follows: 1) perspective on circumcision, 2) health services are compensated, 3) Social Pressure / influence of others, 4) quality of VMMC services and 5) pivots and shifts for the VMMC.

6.3.1. Perspective on circumcision

The first theme constructed was the perspective on circumcision by respondents towards circumcision in general and VMMC in particular. Under this theme, two major subthemes, the positive side of circumcision (Figure 6.1) and problems and concerns with circumcision (Figure 6.2), were generated.

a) The positive side of circumcision

There is a belief among the majority of the respondents in the effectiveness of VMMC as a method for the prevention of HIV. Specifically, the youth (people aged 15 to under 30 years) not only believe that circumcision is good for them since HIV is a big challenge in this population, but they also recommend that all youth be circumcised. Among the voices that affirmed the effectiveness of circumcision as an intervention for HIV prevention were the following.

> *"What I think is that circumcision has reduced the speed at which this virus spreads because they say that circumcision gives at least 60% protection, so the infections have gone down"* (P#07).

"I see it as an important thing to do to prevent HIV, especially among youth, because HIV is common among youth, so when I hear about it, I cannot oppose it; I just have to support it" (P#11).

"I believe in it because it helps us to reduce the spread of HIV, and it also helps me not to get infected easily" (P#02).

". . . I encourage my fellow youth to also go for it so that we can avoid that virus" (P#09).

In addition to the HIV prevention benefit of VMMC, there is also belief and trust in other medical and health benefits that most respondents hold dear, including the need to protect their loved ones from cancer and other infections, as expressed by one of the respondents:

> There is another training that I also attended, and they said that it helps to reduce the spread of cancer in women. In those men who are not circumcised, in the skin around the neck [of the penis], there are viruses of cervical cancer, so those people who are not circumcised spread that virus to the women because, for us men, we are carriers since we do not have the cervix, but we spread to women, so circumcision helps. (P#21)

Further, there is the belief that circumcision makes sexual intercourse safer, less painful and gives peace of mind among a few respondents. Painful sexual intercourse is a significant concern amongst respondents, as it was raised several times, as stated below.

"If you are not circumcised and [you] *have sex with someone, you can get tears"* (P#01).

"When you have engaged in sex when you have a foreskin, it pains you after the sexual encounter, but when you are circumcised, you do not feel that pain" (P#19).

"Those who have been circumcised tell me that during sex they do not get injuries or pain, but for us who are not, we cannot have prolonged sex because we get bruises" (P#13).

The desire to appease sexual partners drives some people to pursue circumcision. Several respondents shared their thoughts and experiences in this regard, and to some, had it not been because of the desire to preserve their relationships, they would not have pursued it.

"Women are no longer interested in men who are not circumcised" (P#21).

"I can tell you that many people do it for women" (P#14).

"If you are circumcised, sex becomes more appealing to the females" (P#12).

"I was told that someone circumcised when he is going into a sexual act, he is always very stable, and he has enough stamina, and the process would be good" (P#27).

Most of the respondents believe that circumcision helps maintain good hygiene for several reasons. Whereas for some, good hygiene is religiously driven (both Christians and Muslims), for others, it is the desire to have peace of mind. Other people seek circumcision out of their initiative to be clean and reduce the need for bathing; to others, it is out of trying to adhere to medical advice on hygiene.

"*For us, in religion, they tell us that circumcision is for hygiene*" (P#06).

"It is very helpful because, by faith, when we read the Bible, circumcision is a symbol of purification" (P#03).

"*It is very good because, ever since I went for it, everything is very nice, I am clean, and I am happy. I am very okay, by the way*" (P#05).

". . . A *circumcised man is very clean and can spend one week without bathing, but someone who is not circumcised cannot go for two days because he will be smelling"* (P#27).

". . . The health worker first told me about personal hygiene" (P#21).

I went for circumcision last year during COVID because, every time I would go to bathe, I would see dirt inside me, and it is a bad thing, but when you get circumcised, all that dirt goes away, so it gave me the courage to go and get circumcised, and since I was circumcised, I feel a lot of peace, and I am fine. (P#25)

Circumcision is done for reasons other than health care, including to satisfy cultural and religious norms, more so among communities with a history of practising traditional circumcision. Substantially outweighing potential health benefits is the urge to maintain cultural obligations through circumcision.

I am a Mugisu [traditionally circumcising tribe], but to be considered a man and not a boy, you have to be circumcised. Yes, it is cultural and then religious because most of my friends are Muslims. I have never heard a friend tell me that they are going for circumcision to reduce their chances of getting HIV. I have only heard about those who say that I have to go because I am a Muslim or a Christian, and now I have converted to Islam. (P#09)

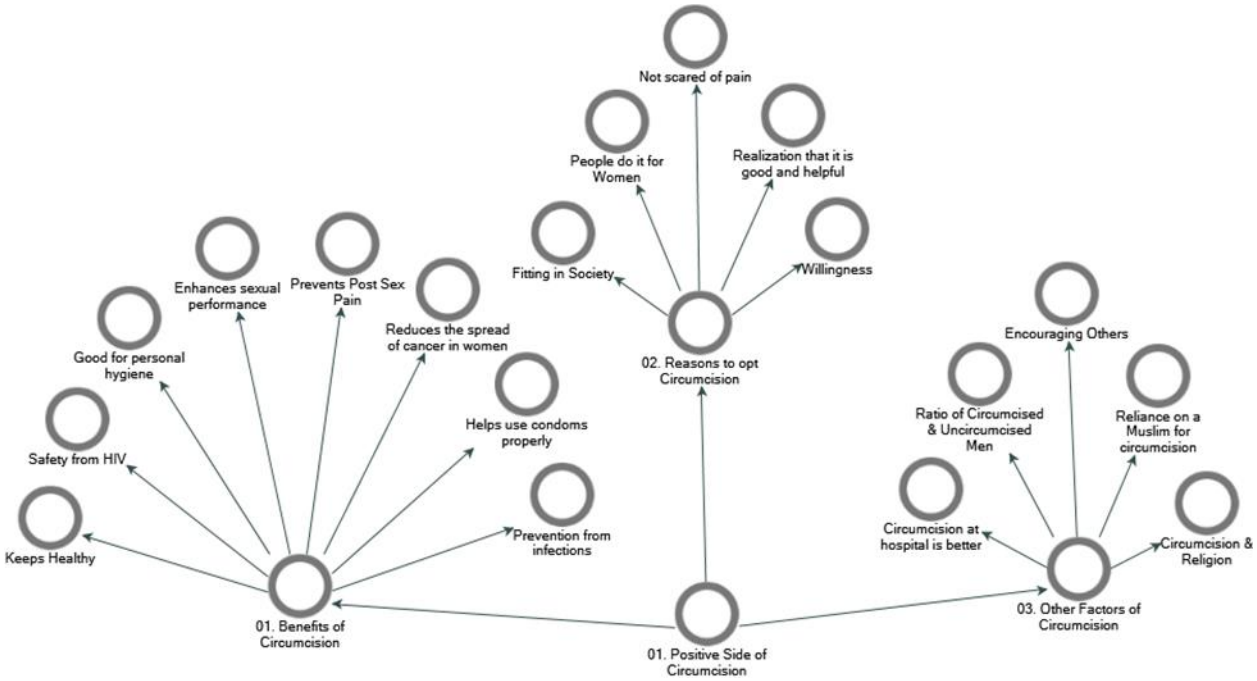

Figure 6.1 Codes for the positive side of circumcision

b) Problems and concerns about circumcision

Rumours and myths about why the government promotes VMMC is a reason why some people are not interested in VMMC. This was reported by a few respondents. Voluntary medical male circumcision is considered a cover-up for population reduction in Africa. There is a belief that VMMC is a hidden contraceptive that is meant to reduce the population among Black people. Other respondents believe that VMMC is not a solution for HIV prevention but rather a ploy to extract the chemical strength that black Africans uniquely possess.

> *"I have heard of a rumour that the government intends to cut our veins through circumcision to decrease population through reduction of manpower" (*P#27).

> *"We Africans have some chemicals that those people do not have, and they do this circumcision looking for that chemical"* (P#14).

There are mixed attitudes towards VMMC as an HIV prevention intervention. Whereas some respondents shared their strong belief in VMMC as a trusted HIV prevention intervention, others neither supported nor recognized VMMC as an HIV prevention intervention or as something that prevents other sexually transmitted infections for historical reasons. Some respondents stated that if they considered VMMC, it would not be for HIV prevention.

> *". . . For the hygiene part and not because it prevents HIV. . ."* (P#01).

The presence of people who have survived contracting HIV and yet are not circumcised raises doubts about the effectiveness of VMMC as an HIV prevention intervention among a minority of the respondents. Furthermore, the fact that still, with circumcision, the chance of HIV acquisition persists does not help.

> *"Our fathers grew up, and they were not circumcised, and so I would be confident that even if I do not get circumcised, I will not die* [laughs] *because it is not a disease not to be circumcised"* (P#22).

> "*As long as there is that word 'chance', which means you can still get it, and that means it does not prevent HIV, so it means I have to try as much as possible to prevent HIV*" (P#12).

> "*I have seen many Muslims who were circumcised when they were still young, but they are* [HIV] *positive*" (P#14).

Similar to the HIV prevention role, the impact of circumcision on sexual performance and pleasure evoked mixed reactions, and to some, it hindered seeking VMMC. Whereas some respondents thought that circumcision improves sexual performance, others still had

reservations about how it would impact their sexual experience and were thus unwilling to undergo it.

> *"You could be used to a different experience during sex when you are not circumcised, and then when you get circumcised, you get a totally different and bad experience, and it makes you wonder why you got circumcised"* (P#01).

> *"We hear stories from people who have been circumcised that they lost manpower, so others also fear losing their manpower because of circumcision, and they prefer to do without it* [laughs]*"* (P#14).

The absence of explicit knowledge and information on post-circumcision care and what to expect appear to be another concern and hindrance to the uptake of VMMC. Several problems regarding post-circumcision pain management were raised by most respondents. Some respondents shared negative experiences following circumcision.

> "*I got cured, but the pain I went through, I regretted*" (P#23).

> I am told that, after circumcision, they stitch you with gauze, so for someone to stitch you with gauze when you are the normal size, what happens when you erect, yet the gauze was tied when you were down? And yet, we all know that when you erect, the size expands (Laughs). It is equivalent to tying a wire on a tree, and the tree grows, making the wire enter inside the tree, so when I think about all those things and the idea of the pain I will go through, including waking up while crying, I can't handle it. (P#14)

The strong desire to meet cultural norms and expectations supersedes the need to seek safe medical circumcision, thus driving men to shun VMMC and to seek relatively less safe traditional male circumcision. Men from cultures that practice traditional circumcision avoid VMMC because of the belief that a man who is not culturally circumcised is considered a coward and may be subjected to cultural circumcision, even after undergoing VMMC.

> Another issue that is so scary is that in the case of the *Bamasaba* [a traditionally circumcising tribe], the culture that practices circumcision, they have a saying that, if a person goes through SMC [safe male circumcision], he has to do it again, that they go and they circumcise him according to their culture because they do not believe in SMC, so someone going through double pain and payment is my worry. (P#21)

The conflict between VMMC and religion is another reason why respondents are against VMMC. Some non-Muslim respondents worried that VMMC was used to initiate and convert them to Islam.

> The way I see it, most people haven't been educated on the importance of circumcision because Muslims sometimes come, but people have perspectives and think that they want to make them change their religions to Islam, so there is not much knowledge, meaning that if you attach a cost to the service when other people think that you are trying to change their religion, then it means they will not come. (P#03)

Low confidence in healthcare workers is another factor negatively affecting VMMC uptake. While trust in healthcare personnel was indicated by the majority of the respondents as a good enticement for VMMC, a few respondents cited using junior and female healthcare workers as

a key deterrent to obtaining VMMC. Respondents also aired their concerns about VMMC in camps.

> *". . . The doctor who worked on us was on school practice, and it worried me because I didn't have the confidence that he would do it well, but surprisingly, all went well"* (P#20).

> *". . . Not getting a good and qualified health worker to work on you, and they do the procedure badly. . ."* (P#02).

> *". . . Not being sure of the person who is going to circumcise them because some people cut people's nerves. . ."* (P#03).

> *"Going to those camps, you find university students who are on internship, and of recent, I have a friend whose vein was cut, so those are some of the things which discourage me"* (P#14).

Limited confidence in the healthcare system, the dislike of the public health approach to offering VMMC through surgical camps and the requirement to test for HIV are reasons why some people shun VMMC. The lack of confidence in healthcare workers during surgical camps, notwithstanding the absence of privacy during circumcision, is another concern. There is also doubt about the quality of drugs used in VMMC camps. Also of concern was that, as part of VMMC service, people are asked to test for HIV on an opt-out basis, which they may not have prepared for.

> "*Young boys and old men were circumcised from the same room*" (P#12).

". . . The drugs they give people in those mobilized camps are not the same type as the ones they give in the pharmacies and drug shops" (P#14).

". . . People are tested for HIV" (P#27).

Contrary to its intended purpose, some respondents viewed VMMC as enhancing their chances of acquiring HIV. Circumcision facilitates the transmission of HIV through cultural beliefs and acts performed after circumcision, as shared below.

> There is propaganda that if the man is circumcised and he is married, after healing, the first person he should have sexual intercourse with should not be his wife because it leaves a bad omen in her. So, from then on, she started discouraging me, and then after that myth, she was suspicious of what would happen after my circumcision. (P#24)

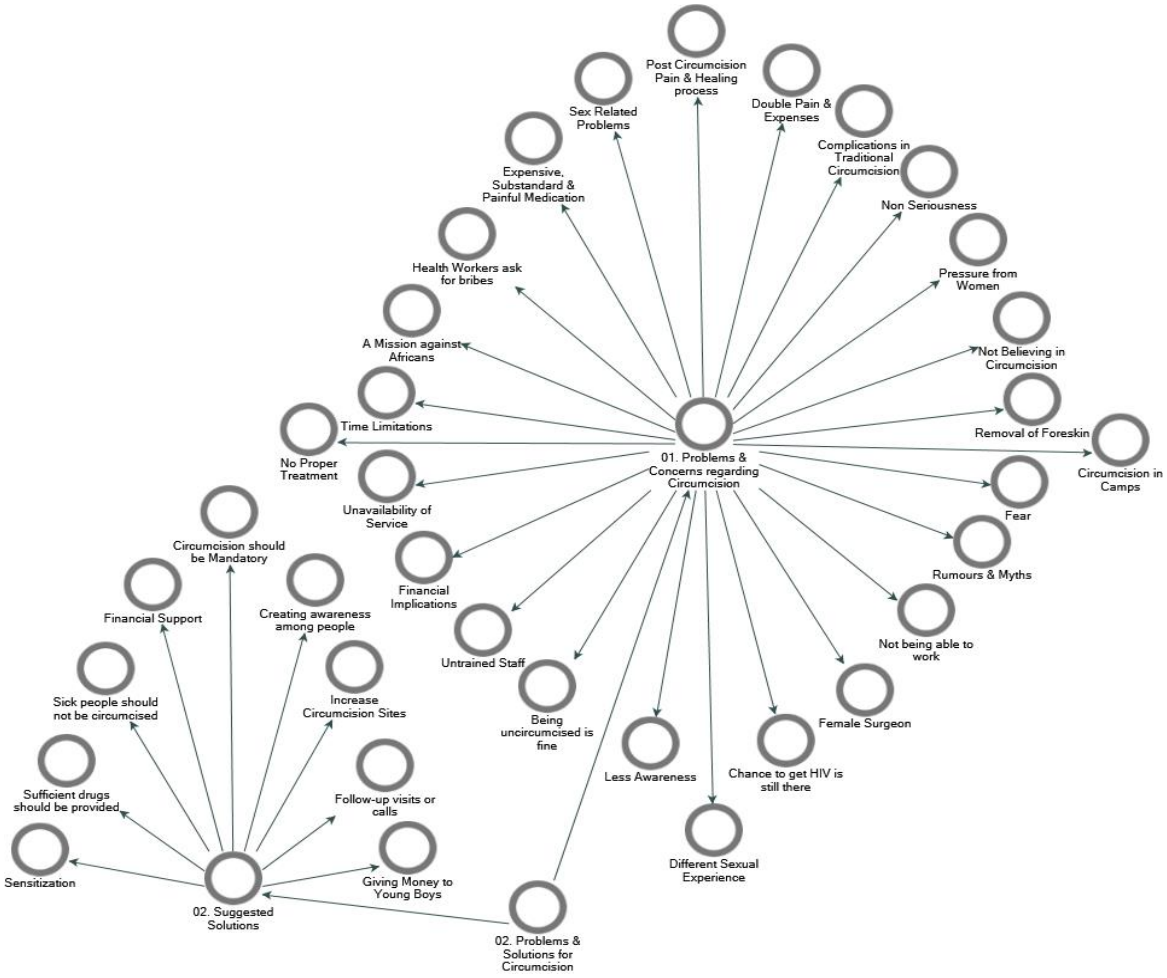

Figure 6.2 Codes for problems and concerns about VMMC and suggestions for improving VMMC

To sum up, the first major theme, perspective on circumcision, presented the views of Respondents regarding circumcision and how they influenced their decisions to get circumcised or not. Two subthemes were generated. 1) positive side of circumcision, and 2) problems and concerns about circumcision. The positive side of circumcision has several subthemes, including the benefits of circumcision, reasons to opt for circumcision, and other factors, which include religious requirements. The negative side of circumcision also had several subthemes, including myths and misconceptions, the desire to meet cultural obligations, low confidence in the health system.

6.3.2. Health services are compensated.

The second theme generated from the data concerned payments for health services. Specifically, respondents shared their willingness to pay for VMMC under this theme. Figure 6.3 shows mixed findings generated from the data under two sub-themes: 1) VMMC services should be paid for, and 2) VMMC services should be free.

a) VMMC should be paid for.

Some respondents view circumcision costs as an investment to minimize future expenses since VMMC is for disease prevention. One respondent thought that paying for VMMC was an investment that saved future expenses.

> *"I believe that prevention is better than cure, so paying is not a problem"* (P#03).

> *"The other thing, paying is not the problem because they might ask you for fifty thousand and you say that the money is a lot, but in future, it costs you much more than what you would have paid"* (P#25).

> As a man, when you are not circumcised, that thing is not good because sometimes you get infections, and you keep spending a lot of money to treat those infections, so [if] I can get the money like maybe UGX50,000 and go to the hospital for a circumcision. (P#17)

Further, a few other respondents think that paying for VMMC is normal, just like any other medical obligation that must be incurred; thus, paying for VMMC should be perceived from the same perspective.

"It is just like paying for other services in the hospital, and I think if I was not circumcised, maybe I would have contracted other diseases like candida, and so I would pay for my children" (P#27).

"In the end, it is beneficial to your health, so [it is] *something that is going to help you, and the cost is not high for someone to afford; it is not bad"* (P#06).

So, aren't there individuals who suffer from malaria and go for private services where they pay? Therefore, it should also be considered like any other sickness, and any willing person can access the services, so you just find out the cost. For example, if it's like UGX30,000, then the medicine to buy could be UGX20,000. Save your UGX50,000 and [use it to] go receive the service. (P#24)

VMMC should be reasonably priced and not exceed UGX20,000 (£4.50). Some respondents were okay with paying for VMMC if the cost was affordable. Several proposals and suggestions were made that are considered reasonable. Other respondents opposed paying amounts that they considered prohibitive. At the same time, some respondents are willing to pay for VMMC as long as the cost is all-inclusive of any postoperative care required.

"Five-thousand or UGX10,000 is affordable" (P#29).

"I agree with payment of the service as long as it's affordable, it's very okay" (P#25).

"If the money is high, like UGX100,000, I will keep postponing it, and I [might] end up not even doing it" (P#03).

"If the whole cost goes for UGX20,000, plus drugs and bandages, then people could be willing to pay for it" (P#27).

The custom of associating free services with poor quality and paid-for services with good quality is another driver of willingness to pay for VMMC. Some respondents considered free VMMC services to be of poor quality because they attract many people, and the quality gets compromised. Other respondents thought that private clinics had better experts than those in VMMC camps.

> *"I don't want things of many people because I fear getting infections from there and . . . that's why I decided to go and pay"* (P#20).

> I have already told you the reason: free things are very expensive because there are things behind the scenes that you people don't see, and they can't even tell them to you [laughs]. I believe that you get an expert to do it for you in a clinic or drug shop, and then they give you medicine, which you pay for. Things for free are not easy, and that is the truth [laughs]. (P#14)

People's attitudes and beliefs regarding the benefits of VMMC are crucial in deciding whether to pay for VMMC. Respondents who had a positive attitude towards VMMC were more willing to pay than those who did not. Several voices shared a positive attitude that influenced them to pay.

> *"Yes, I would be willing to pay because, besides the cultural bit, it keeps the man clean, but having a foreskin makes one unhygienic, so I would pay for it if it was for paying, and that is for the hygiene"*(P#01).

> *"I would be saving my life. I am not saying that one who is not circumcised doesn't get infected, but the chances become limited when you are circumcised"* (P#13).

"As a person, if I have the money, I can pay because of the benefits of circumcision that I know" (P#03).

"I am willing to pay for it because I have seen the benefits of circumcision from my friends" (P#11).

The effect of the benefits of VMMC in influencing willingness to pay for VMMC is reinforced by positive lived experiences. One of the respondents, who was already circumcised, shared their experiences:

> I know the advantages of circumcision and am willing to pay for my children. Personally, I am already circumcised, and it was free of charge through SMC, but if the service is no longer free, I can pay for my children at any cost because of the advantages and the knowledge I have about the practice. (P#21)

b) VMMC services should be offered free.

The majority of respondents feel entitled and believe that VMMC should be offered free of charge since it is a public good. Further, they consider that VMMC should be incorporated into public health services and plans, just like the treatment of other illnesses, so that whoever needs to be circumcised can access the service at the nearest health facility. One respondent believed that asking people to pay for VMMC would negatively affect the demand for the service.

> "If health experts confirm that it does contribute to the prevention of HIV, then it should be a free service. And it should be in the national plan to eradicate the spread of HIV in the country" (P#12).

> I think that it will reduce the number of people who are getting circumcised because right now it is free, but you just have to encourage people to go, so if you put money, people will say that they don't have money, and they will use it as an excuse not to go, but when it is free, it is easier to convince someone to go for it. (P#13)

Voluntary medical male circumcision has an opportunity cost that some respondents are unwilling to incur and do not consider it a priority due to prevailing economic hardships. Respondents shared their sentiments on how VMMC is less of a priority, such as:

> *"It should remain free because some people don't have money (laughing)"* (P#04).

> I do not believe in people paying for the service; I object to that. Because we are in a third-world country and people cannot afford medical services, I think if they can't afford to treat themselves for malaria, how will they afford to pay for circumcision? It should continue to be a free service. (P#22)

> I think that there are people who cannot afford it, so the person looks at putting money in circumcision, yet even if they are not circumcised, they will be alive, so I can't pay because, if at the moment I don't have money for posho [maize meal], and then I think of getting money to go and pay for circumcision yet, even if I am not circumcised, I will remain alive, so I see that it will not work. (P#13)

The ability to pay for VMMC is another factor that affects the willingness to pay for VMMC. Several respondents shared stories that indicated that they could not afford the cost of VMMC due to the absence of a stable source of income. Some pointed out that they were their family's sole breadwinners and relied on daily earnings to sustain their families, and they questioned how their families would cope.

"Most of us depend on the daily wage" (P#24).

"I like that thing, but I fear that if I do it, I will not be able to work and provide for my family, and they might die of hunger" (P#17).

"I am a volunteer and have to work every day. I don't get leave, and if I don't work, I cannot get that little allowance I get when I work daily" (P#03).

Another factor influencing how people perceive paying for VMMC is the cost of post-circumcision treatment. Some VMMC clients are anxious about complete recovery and the expenses related to any adverse effects following circumcision. While some individuals may be able to finance the surgical procedure, the unknown post-circumcision costs are of particular concern. Respondents believed that one needed sufficient preparation for VMMC by putting aside enough money for contingencies.

"The other thing is that they might circumcise you, and they don't give you the treatment you need" (P#01).

Yes, my worry is that we react differently. When someone is circumcised, some people's bodies take longer to heal, so the expense of treating the wound, the burden is on the client and the parents, yet sometimes getting money for nursing the wound for low-income earners may be difficult, especially in this economy of low developing countries like Uganda where most things are expensive more, especially the drugs with prices that keep going high, so it leaves us in fear, and I worry that the free service should never come with a cost because in most cases the service is free, but the out effect is for payment. (P#21)

Equity in providing VMMC services is another crucial element that needs to be considered when offering VMMC at a cost. Respondents think that not everyone should be asked to pay, and some groups should be excused from paying for VMMC, not only because it is unfair that they pay, but also because they would find it hard to afford the cost, as mentioned by three respondents:

> There are people who cannot afford to pay for it, so they should separate those who can pay and those who cannot. There are also people who are down in the communities with very little or no income to afford, but there are those who have their money and can pay. So, those who can't pay should call them for free services. (P#02)

Furthermore, there is a concern that paying for VMMC might introduce corruption and delays in service delivery; therefore, it is better to leave it as a free service. A few number of respondents stated this.

> When they attach a cost, you might find that there is a certain figure they have determined, like maybe UGX5,000 or UGX10,000 shillings. Still, in some facilities, you might find some health workers inflating the costs and even asking for bribes from clients like UGX20,000 to be able to receive a faster service than others, but when the service is free, even the health worker knows that all people have to be handled the same because the service is free, so bringing in the issue of paying may cause unfairness that, even if I was the first at the hospital, the one who gave them a bribe will be worked on and leave me there. I will probably even go back home without receiving the service. (P#06)

To conclude this section, the second major theme generated was health services compensation. The theme has two major subthemes: VMMC is paid for, and VMMC should be offered free. Respondents who think VMMC should be paid for thinking that VMMC should be perceived as any other medical service that people usually pay for. On the other hand, respondents who reported that VMMC should be free think such an important service should be availed to anyone who needs it irrespective of how much it costs to address equity.

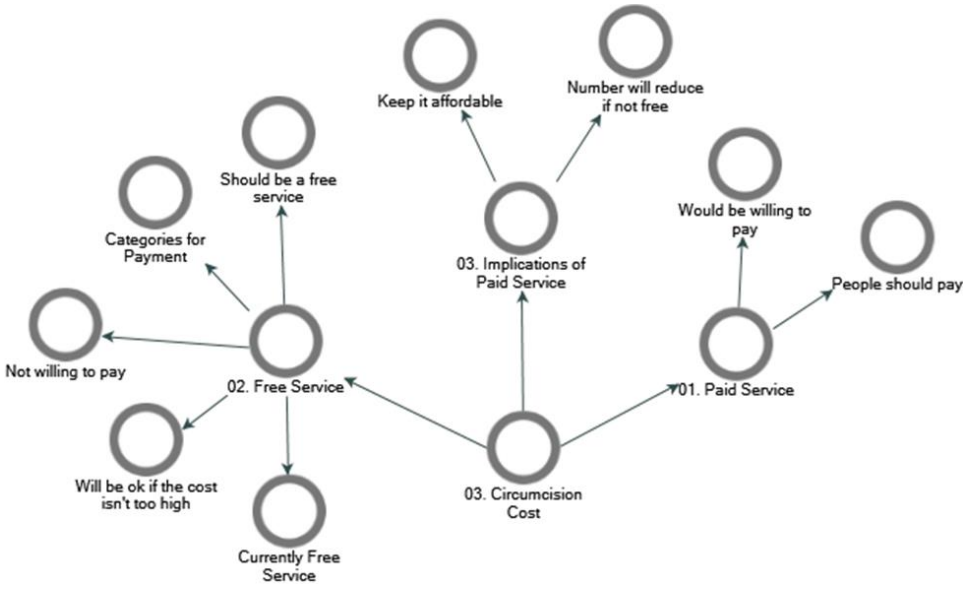

Figure 6.3 Codes for views on paying for VMMC

6.3.3. Social pressure

The third theme generated was social pressure. Under this theme, the influence of significant others, such as peers, sexual partners, family members and friends, is noted. Some influences were positive, while others were negative (Figure 6.4). Four subthemes were constructed: 1) coercive influence, 2) supportive influence, 3) attitude towards social pressure and 4) facilitators for uptake of VMMC.

a) Coercive influence

Whereas adult circumcision would be considered an individual and/or a private matter, the decision on whether to seek the service is sometimes influenced by subjective norms. The desire to preserve sexual relationships specifically appears to be a strong driver, and it was evident that some respondents were coerced by their loved ones to seek circumcision. Prominently, sexual partners appeared to have a strong influence, including setting circumcision as a prerequisite for maintaining their relationships, as shared by some respondents:

> *"Yeah, sometime back, I had a girlfriend who told me that if she had found [me] when I was not circumcised, she would have pushed me to go for circumcision"* (P#13).

> *"My girlfriend and I had dated for two weeks . . . and she told me that she doesn't date guys who are not circumcised, and I loved her, so that is why I went and got circumcised"* (P#22).

> *"Yes, one woman . . . told me she cannot have sexual relations with a man who is not circumcised"* (P#02).

Social proofing norms, such as the relatability to actions by peers, are the other drivers for seeking male circumcision among the majority of the younger respondents. Respondents shared their experiences with friends who coerced them into seeking circumcision.

> Some male friends of mine also told me to go and do it. They gave me some reasons, and one was that it reduces the chances of getting HIV, somehow at least, and the other things were like male discussions that, if you are circumcised, sex becomes more appealing to the females; there was also mention of protecting your female partner

from infections because the chances of passing the infections to your partner are very high. (P#12)

b) Supportive influence

Other than sexual partners, biological relatives are the other group that influences people to seek circumcision, albeit with mixed recommendations. Unlike the sexual partners, whose influence is mainly for the benefit of themselves (the sexual partners), for the biological relatives, their reasons for influencing their loved ones to seek circumcision appear essentially to be in the interest of the recipient and not for themselves, including those who are against VMMC. Notably, several respondents were requested to seek circumcision by their parents to meet their cultural and religious obligations and for health reasons. Several voices shared this experience:

"Yeah, my parents really pushed me because they are the ones who initiated the cultural thing" (P#13).

"Even my own father told me to go for circumcision to prevent infections, and that I would reduce my chances of getting infections" (P#17).

"My brother and my uncle told me to go and get circumcised to save my life" (P#10).

Although not all biological relatives recommend circumcision, the intention remains positive, and it is in the person's best interest to be circumcised.

"The person who didn't believe in it was my young sibling who used to fear that I will be in pain, but they were there" (P#10).

"My mother was the one who was fearing, yet for me, I wanted. . ." (P#20).

Besides the significant others, positive messages from trusted sources, such as health workers and teachers, influence people to seek circumcision for the majority of the respondents. "*At school, we had been sensitized about the same issue, and they encouraged us to go for SMC, so mostly the ground was levelled*" (P#27). Several respondents shared their experiences of how health workers had a role in their decision to seek circumcision. "*Yes, but the person who encouraged us most was our VHT* [village health team] *worker*" (P#27); "*I got circumcised way back, but it was due to sensitization from the health workers*" (P#25).

> The health worker first told me about personal hygiene. He said a circumcised man is very clean; another reason he gave me was that, with the cases of STDs, the chances of you contracting such is very low, although it's not 100%. (P#21)

c) Attitude towards social pressure

There is generally a positive attitude towards being advised by someone else to get circumcised among most of the respondents. Among the reasons why respondents think it is okay to get advice/encouragement from other people is that it motivates them to move out of indecisiveness about getting circumcised.

> *"I would also not go for it, but when you have someone who pushes you and reminds you, eventually you make up your mind and say, 'let me go for it', so it helps when someone keeps reminding you and advising you"* (P#13).

The experiences of those who are already circumcised are crucial in addressing some of the concerns among those yet to be circumcised.

> *"Yes, my friends counselled me that it was simple and easy"* (P#29).

"Yes, it is good because there are people who may fear pain, but when they get people to talk to them about it, it is good and helpful" (P#02).

Advice from health workers aids in validating information obtained from less trusted sources.

"My girlfriend also just heard about it, but now if people with knowledge on the issue like the health workers and VHTs tell you about something like this, you would gladly do it" (P#07).

d) Facilitators for uptake of VMMC

The absence of circumcision services that are convenient for people with tight employment demands and for those who depend on daily income for survival affects the uptake of VMMC. The failure of the would-be recipient to get time out of their work schedule to go seek VMMC is a hindrance, as mentioned by most respondents: *"Yes, just because I have not got time to go for this service, but it's in my plan*" (P#26); "*Yes, I want to get circumcised, but it's only because of the job that I haven't done it*" (P#13). Another respondent had this to say:

"I will go one day and circumcise. [I] am still thinking about it just because [of] the earning beat challenge; most of us depend on the daily wage, so I always worry of staying home for a full week" (P#24).

Other than work commitments, some people who desire circumcision do not know where to find it and have unaddressed concerns, as shared by one respondent.

I have been interested in it for some time now, but the problem is getting a clear place or which hospital I can go to and thinking of the healing process and the fear of the cutting; those are the things that make me hesitate a little. (P#12)

In conclusion, the third theme generated was social pressure. The theme has four major subthemes: coercive influence, supportive influence, attitudes to social pressure and facilitators for VMMC uptake.

6.3.4. Quality of VMMC services

The fourth theme relates to the quality of VMMC services. The theme captures respondents' views on the quality of VMMC services and how they impact their willingness to pay for services. Two subthemes were identified: 1) good quality service and 2) poor quality service.

a) Good quality service

Most Respondents seem to be more concerned about immediate adverse events during or after circumcision, and their absence indicates a good quality service. Absence or minimal pain (bearable) and other adverse events, such as severe bleeding during and after circumcision, indicate good quality circumcision.

> But before, we had come with a different mind of having a lot of pain, which would hinder us from doing our causal work like before; actually, we were too scared. I even asked the health worker whether I would be able to go to school and have my lectures; they told me it was very fine. So all our fears were cleared, and the services were perfect. I highly appreciate it. **(P#21)**

Counselling before circumcision to address any concerns and informing clients about what the circumcision process entails are factors that people seeking circumcision highly value and thus are attributes of good quality service. The demonstration of services appears to be particularly

well appreciated in allaying fears. When asked to share their experiences, several respondents were happy about being counselled before the procedure. Some of the responses include:

> *"The services were very good, first of all; they prepared us very well before we could go for the circumcision"*(P#21).

> They also had a stick which they used to demonstrate how they would inject you to sterilise [numb] you, so if you had fears of pain when you heard about that, the fear would go away, and you become strong. (P#25)

Another measure of good quality circumcision is the provision of postoperative drugs and all accompanying services at no cost in a clinic with good hygiene.

> Yes, they gave us drugs that take us up to two weeks, but they also had Panadol and other drugs, and I didn't incur any costs; in fact, some people got healed very quickly, and they didn't need any further treatment. (P#22)

Additionally, one respondent was particularly happy with measures taken to prevent cross-infections between clients:

> "Equipment was enough. Whatever was used on an individual was disposed of, so everything was perfect; everything was very organized because they kept changing the bed sheets per person" (P#27).

Other than medical-related services, VMMC clients rate highly being valued, listened to, informed and motivated as people. Further efficiency, being handled with dignity and trustworthiness, allowing people to consent, and having a welcoming environment are other things that people appreciate.

"*I liked the way they handled us, I highly appreciated [it]*" (P#29).

"When I reached there, they welcomed me to their tent, which is separate from the hospital" (P#16).

"First, [they] want to prove if you really want to go through with it" (P#20), and *"There were no queues"* (P#27).

"All people are treated equally, without discrimination" (P#11).

Yes, I was very happy because the health workers showed us care, and the services were very fast. We never took long in queues; they attended to us. Accordingly, we were handled with a lot of privacy and dignity, so I was very pleased with the services. (P#25)

The service was good because all the things they promised to do for us were done. They promised to treat us, take care of us, and even visit us to check on us. After three days, they came and followed us at home to check on us. And they gave us the medication, and when we got fine, you would go and fill in the form showing that all went well, and you didn't get any problems. (P#10)

Providing good quality services appears to be one way to improve demand for VMMC. Respondents who had a positive experience with the VMMC service reported sharing their experiences with friends to encourage them to seek the service.

Yes, it influenced me and made me more confident, and even my friends, when they saw me, they liked it because most times, people fear being circumcised and not getting treatment since some of them don't have money and don't even know which

medication to use, but when they saw that I received all the care and treatment I needed to be fine from the health workers without a cost, they were encouraged because they saw that they wouldn't find challenges in treatment. (P#10)

b) Poor quality service

Not all respondents have a pleasant experience with VMMC. Specifically, people who experience pain during and after circumcision and those who get infected wounds and do not get help from the circumcision team describe such a service as poor quality.

"I can say that the service was not very good because of the challenges I got after circumcision" (P#19).

I was sterilised [anaesthetised] and did not know that after, the pain would come back, so when I reached home, the pain was back. I took the tablets, but they were not of help, so I went back to the health Centre to see the people who had done it, but they were no longer there, and yet my wound was becoming worse. (P#27)

To conclude the fourth major theme, the quality of VMMC services, two major subthemes were generated, i.e., good quality and poor quality VMMC. This theme represented respondents' views on the quality of VMMC and how it influences their decision to accept or reject VMMC.

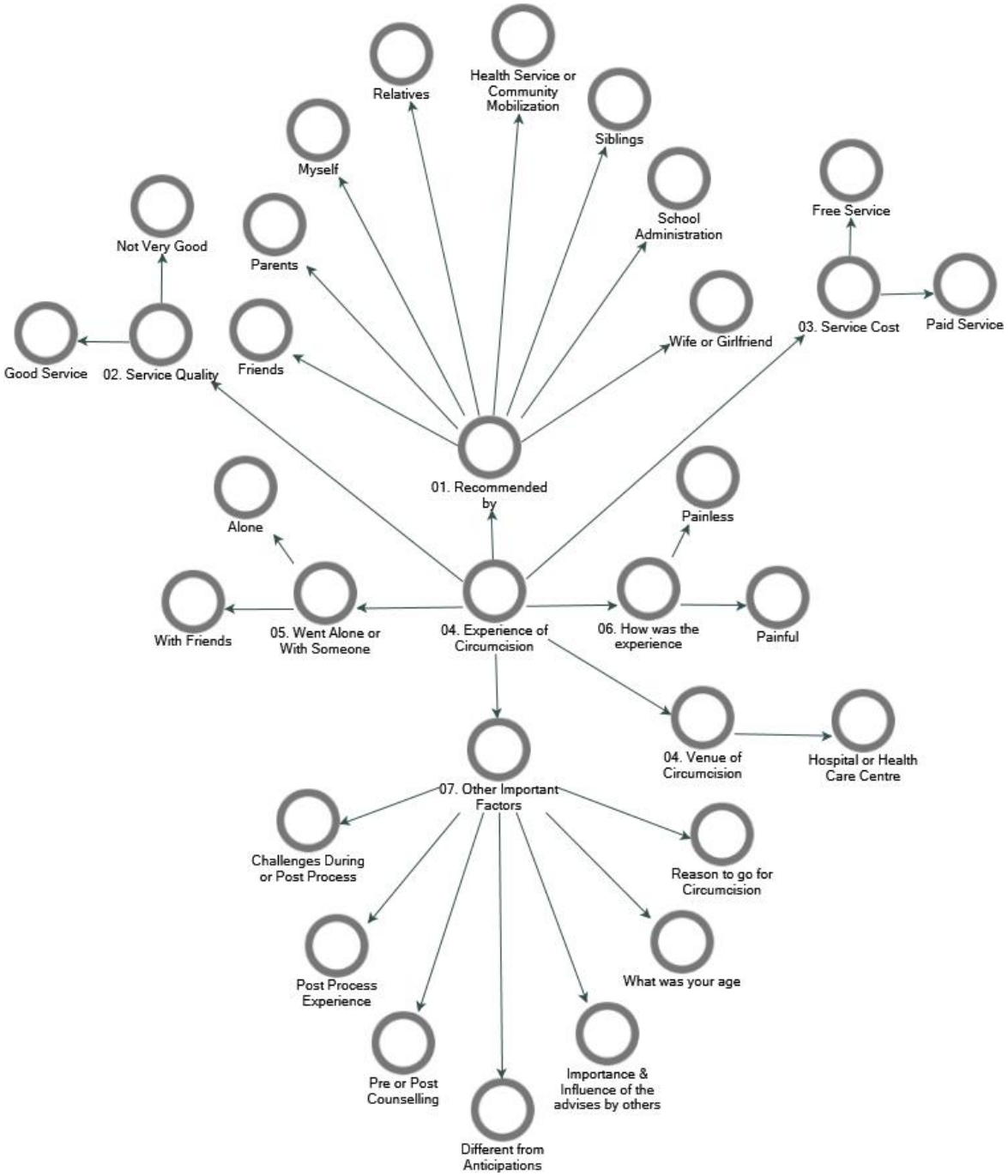

Figure 6.4 Codes for experiences from respondents who were already circumcised

6.3.5. Pivots and shifts for VMMC

The fifth theme generated from the data was recommendations for VMMC. Under this theme, the respondents' recommendations for how to improve the uptake of VMMC are noted. Four subthemes were created: 1) insufficient messaging, 2) highlighting other benefits of

circumcision other than HIV prevention, 3) addressing barriers, and 4) the supply of VMMC services.

a) Sufficient messaging

The lack of appropriate and sufficient information about VMMC appears to be a hindrance to its uptake. Several respondents recommended more VMMC sensitization campaigns to reach as many people as possible.

> *". . . Start with schools because that is where most teenagers. . ."* (P#25).

> *"In the villages . . . and in towns, because people need to be given information before they are circumcised"* (P#11).

> *"There should be enough sensitization to the parents and the clients. The VHTs* [village health teams] *should be facilitated to educate people mostly in rural places at the grassroots to increase awareness"* (P#27).

> Starting at the national level, the government should prioritize sensitization. Inform people, and put those things on the radio, and let them put up banners so that people can get clear information, and they should indicate that you go to this place. (P#12)

b) Benefits of circumcision other than HIV prevention

HIV prevention does not appear to be strong enough to convince some people to undergo VMMC. Thus, there is a need to sensitize people about other benefits of circumcision. Respondents shared their doubts about HIV prevention.

"I have seen many Muslims who were circumcised when they were still young, but they are positive. The Muslims who grew up circumcising do not depend on it for the prevention of HIV, so there are different reasons (laughs)" (P#14).

I think that it has less to do with HIV prevention because, even if you are circumcised and you are having intercourse, you can still get HIV if your partner is infected. So, I really don't see how circumcision can prevent HIV. (P#13)

However, another respondent had a different opinion as to why people have doubts about circumcision preventing HIV and thought it was due to how people behave post-circumcision.

Some of them are totally misled because they think that once one is circumcised, they don't get HIV completely, so they engage carelessly with anyone, and this mentality is not good, so to take it out of them, they need to be educated. (P#16)

c) Address barriers

If the demand for VMMC is to improve, financial barriers to accessing VMMC services should not exist. Respondents recommended eliminating all financial barriers before and after circumcision so that people get free service and support after circumcision.

". . . They should encourage circumcision, and it should be free of charge; however, there should also be additional support to help those who go for VMMC, like financial support'' (P#23).

Several fears, myths and unaddressed concerns hinder the demand for VMMC. Until these concerns are addressed, some people will continue to shun VMMC. Respondents

recommended that concerns include reassuring people that the procedure is done under anaesthesia and, thus, that painlessness should be addressed.

Propaganda . . . that the government wants to reduce sexual manpower so that they control the population "(P#25).

. . . People say that those injections they use affect you in the future . . . start feeling like you have electricity in you . . . [you] lose your strength, [and] as a man, you can't erect anymore. (P#11)

"One needs to put on a skirt after circumcision" (P#10).

d) Supply of VMMC services

The financial barriers notwithstanding, geographical access and irregular service delivery are the other barriers hindering the scale-up of VMMC. Some respondents felt that VMMC sites were not easy to access, that the business hours for the clinics do not suit people who are available only after hours and over the weekends, and that the number of VMMC clinics remains inadequate to serve all who need the service.

"The VMMC sites are very far, and this has hindered most of our teenagers to go and receive [VMMC]*"* (P#25).

"Circumcision should be continuous in our health centre because most of our peers are not willing to move" (P#21).

"They should also increase on the number of circumcision sites within the communities because the health facilities may be far, and yet this voluntary circumcision doesn't happen every day" (P#11).

To conclude the current major theme, the fifth and final theme generated was about pivots and shifts for VMMC. The theme had four subthemes that included sufficient messaging, benefits of circumcision other than HIV prevention, and addressing barriers and supply of VMMC. The theme presented the views of Respondents regarding improving VMMC.

6.4. Chapter summary

Chapter 6 presents the results of the qualitative part of the study. In-depth interviews were conducted with 29 respondents with an average age of 28. Five analytical themes were generated: 1) perspective on circumcision, 2) health services are compensated, 3) Social pressure/influence of others, 4) quality of VMMC services and 5) pivots and shifts for the VMMC.

Chapter 7 triangulates the findings of the quantitative and qualitative parts of the study. In this chapter, the findings are first interpreted according to the study objectives and then discussed in relation to the existing literature.

7. DISCUSSION

7.1. Introduction

This chapter triangulates the quantitative and qualitative results to provide answers to the study questions. The chapter begins with a discussion of the motivation for the research (Section 7.2). Following this is a presentation of the main findings from the study (Section 7.3). The major findings from the present research are that most (85%) people have the ability to pay for VMMC and are willing to pay for VMMC. However, most (76%) people are willing to pay an amount (UGX32,379 (£6.8)) that does not cover the full cost of the services. Various factors, including people's attitudes towards circumcision, the ability to pay, and the quality of VMMC services, influence the willingness to pay. The detailed findings for the first objective are discussed in Section 7.4, while the second objective is discussed in Section 7.5. The findings for the third objective are triangulated within the discussion for Objectives 1 and 2. In the discussion, a case for why payment for VMMC is an option for sustainably offering VMMC services is made. The chapter concludes with the strengths and limitations of the current study in Section 7.8.

7.2. Study rationale

This doctoral thesis aimed to determine the ability and willingness to pay for voluntary medical male circumcision to sustain male circumcision for HIV prevention in Uganda. The background to this study was that HIV and AIDS services, including VMMC, are primarily funded by international donors, notably PEPFAR and the GFATM. To sustain these services, donor funding needs to be replaced with another source of domestic funding. Recognizing the restrictions of the present domestic budget, it would be difficult to get financing via taxes. Abah (2020)

proposes suspension of debt repayment or relief from debt repayment as an alternative to free up domestic resources that can be channelled to HIV and AIDS. There is no guarantee that money earmarked for debt repayment will be specifically allocated to HIV and AIDS responses. Although it may not raise the same amount of funding, out-of-pocket payments are an option for domestic funding that has not been explored and could potentially replace some donor funds.

The motivation behind this study was partially driven by real-life examples, such as people paying for fee-for-service clinics in public hospitals where free general clinics are available, people paying for private schools when free public schools are available, and people paying for business class when cheaper economy class seats are available on the same aircraft. The research was based on the fundamental economic theory that rational, forward-thinking consumers buy items or services that increase their well-being while incurring minimum costs (Culyer, 1989). Therefore, it is reasonable to assume that a combination of pull and push forces motivates consumers to pay for services or opt for more costly services when free or inexpensive alternatives are available. This study was thus informed by the same thinking that people would be willing to pay for VMMC if they found utility in it. Further, if what would pull or push people away from paying for VMMC could be determined, followed by defining the profile of the individual who is able and willing to pay for VMMC, then the Ministry of Health or policymakers would target these people with fee-for-service VMMC and reserve the little public resources to subsidise those unable to pay fully. To determine the pull and push factors, the study was framed around the theory of planned behaviour (Ajzen, 1985b). The theory of planned behaviour postulates that behaviour intention, for instance, paying for voluntary medical male circumcision, is a function of the attitude towards the object or service, the

influence of subjective norms and perceived behaviour control. Therefore, the study set out to first identify if people had the ability to pay for VMMC and, if so, what factors would determine their ability to pay. Second, the study aimed to determine the factors influencing people's willingness to pay for VMMC. Finally, the study aimed to qualitatively identify the reasons that inform people's willingness to pay for VMMC. Overall, the study aimed to extend the use of objective methods in health policy formulation. As documented by (Mayora et al., 2023), the use of health technology assessment to inform health policy is still very limited in Uganda.

7.3. Summary of main results

The study found that most people have the ability to pay and willingness to pay for VMMC. The majority (85%) of the people have a monthly personal revenue of at least UGX85,000 (£17.94), which is considered sufficient to pay for VMMC at an average unit cost of UGX81,400 (£17.18) (Bautista-Arredondo et al., 2021), and thus had the ability to pay for VMMC. Furthermore, most (76%) of the study respondents were willing to pay for VMMC. Among those willing to pay, 88% prefer to pay less than UGX100,000 (£21.10).

Increasing age, irreligiousness, and better education positively influence the ability to pay for VMMC while residing in rural areas. Having no education or primary school-level education, self-employment, and high perceived behaviour control (an individual's assessment to pay for VMMC) are factors that decreased the ability to pay for VMMC. The ability to pay, to have knowledge about VMMC and belonging to the Islamic faith were positively associated with willingness to pay for VMMC while having no education, residing in a rural area, and having high perceived behaviour control were negatively associated with the willingness to pay for VMMC.

Mixed findings were found in the in-depth interviews. Respondents who expressed willingness to pay for VMMC cited the positive benefits that arise from being circumcised, which are not only for the recipient but also the partner, an affordable cost for VMMC, positive influence from peers, sexual partners, parents and guardians, and good-quality VMMC services, as reasons that informed their willingness to pay. Respondents who indicated an unwillingness to pay for VMMC, among other reasons, cited VMMC as a public good that should be provided at no cost to the recipient, poor-quality services and the prevailing challenging economic situation as influencing their decision.

The findings contrast with what Wandei et al. (2016) found in Western Kenya, where most households (62.2%) could pay, but only 40% were willing to pay for VMMC. This may be attributed to the fact that Wandei et al. interviewed household heads, some of whom were females, while in the current study, the respondents were composed of only adult males. Adult male circumcision is a private matter; thus, compared to households, individuals are likely to find utility in the service. Wandei et al. did not explore the reasons that informed the WTP decision, a gap that the current research addressed.

The study population for the quantitative component was representative of the general population. As presented in Table 5.1, the study population comprised 85.2% Christians, which matches the general population, where 84.5% are Christians, and 90% were married or cohabiting, which matches 65% for the general population (Statistics, 2016). However, regarding the level of education, the majority (55%) of the Respondents had primary-level education; for the general population, the majority (41%) had completed secondary-level education. Like the general population, most Respondents were self-employed and resided in rural areas. The average income for study Respondents, as presented in Table 5.2, was

UGX250,000, which is lower than that of the general population at UGX435,656 (Statistics, 2016). This may be attributed to the inclusion of students in the study population. The respondents for the qualitative component were much younger (average age of 28 years) than the quantitative component (average age of 43 years), even though they were drawn from the same database. This might have been because prospective respondents were informed that the interview would last about 1 hour and 30 to 45 minutes for qualitative and quantitative interviews, respectively. The older people likely to be busier with their day-to-day duties tended to opt out at this stage. This is a potential limitation of the study that older men missed the in-depth interviews. However, interviewing the younger people is also a strength because whereas VMMC targets all males aged at least15 years in Uganda, there is a preference for males aged 15 -34, who have the highest risk for HIV infection because they are in the active reproductive age group, and thus, targeting them with VMMC would result in a more immediate impact on HIV prevention.

7.4. Factors that determine the ability to pay for VMMC

The first objective of the current research was to identify the factors determining the ability to pay for VMMC. As Chapter 2 identifies, the ability to pay for HIV services is not well documented. The literature search noted that most studies reported the ability to pay as the willingness to pay. Only one study by (Wandei et al., 2016) documents the ability to pay.

Amongst the people who stated they were unwilling to pay for VMMC, 52% said it was because they could not afford it. Objectively, the study found that 85% of the respondents had the ability to pay for VMMC based on a monthly personal revenue of at least UGX285,300 (£60.20) for the lowest earners, compared to an average VMMC cost of UGX81,400 (£17.18), which is

approximately 28% of the monthly income for the lowest earners. Whereas spending approximately 28% of one's monthly income on VMMC may appear unrealistic, VMMC is a once-in-a-lifetime procedure that offers lifelong benefits (WHO, 2020) and, thus, a worthwhile investment.

In the current research, increasing the age of the respondent ($p < 0.1$), better education (degree or diploma) ($p < 0.05$) and having no religion ($p < 0.01$) were found to be positively associated with the ability to pay for VMMC while residing in the rural area ($p < 0.01$) and high perceived behaviour control ($p < 0.1$) were negatively associated with the ability to pay for VMMC. The qualitative interviews raised the ability to pay for VMMC as an essential reason for paying for VMMC. Some respondents reported they could pay for VMMC if it is reasonably priced and proposed about UGX20,000 (£4.22), including post-operative care. UGX100,000 (£21.10) was reportedly high and not affordable. Dependence on daily income for survival is another factor determining whether one can pay for VMMC. Due to the harsh economic situation, some respondents thought paying for preventive health services, such as VMMC, was not tenable.

The findings raise important considerations for sustaining VMMC through cost recovery. There is a huge variation in the ability to pay for VMMC, which might reflect the respondents' various social and economic statuses. Personal revenue ranged from zero to UGX8,000,000 (£1,688), and therefore, equity will need to be incorporated in any cost recovery plans by policymakers, fully aware that some people will not afford VMMC even at the cost of UGX20,000 (£4.22) and thus will continue to seek free services. The factors to consider will include the individual's age, education, income and religion. These findings align with what has been previously documented, where income (Adekunjo et al., 2020; Evans et al., 2019; Mbachu et al., 2018),

age and education (Geldsetzer et al., 2020) are documented to influence the ability to pay for health services. Additionally, policymakers must be mindful of the prevailing cost of living before any decisions on payment for VMMC are made since several respondents reported that VMMC had a high opportunity cost and was thus not a priority in the prevailing economic challenges.

7.5. Factors associated with the willingness to pay for VMMC

The second objective of the current research was to identify the factors associated with willingness to pay for VMMC. As reported by Wandei et al., the ability to pay for VMMC may not necessarily translate into willingness to pay; thus, the factors that influence WTP are equally important. In the current study, the factors that determine WTP were explored. At bivariate analysis, ability to pay ($p<0.1$) and being a Muslim ($p<0.01$) were found to be positively associated with WTP, while having no formal education ($p<0.05$), residing in the rural area ($p<0.01$) and transportation costs to a VMMC clinic ($p<0.1$) were negatively associated with WTP. In a multivariate analysis, being a Muslim ($p<0.1$) and having knowledge of VMMC ($p<0.1$) were positively associated with WTP, while low perceived behaviour control ($p<0.01$) was negatively associated with WTP. These findings collaborated with some of the findings from the in-depth interviews.

The findings of the in-depth interviews were mixed regarding willingness to pay for VMMC. People who had knowledge about the benefits of VMMC thought that paying for it was fine, since it was an investment in one's health. However, some respondents reported that people associate free services with poor quality, which presents an opportunity to recover some costs from VMMC only if the service's quality meets people's expectations.

Beyond the direct costs of VMMC services, consideration of other expenses incurred while seeking VMMC is another important factor. Transportation costs ($p<0.1$) to reach VMMC clinics were negatively associated with WTP for VMMC. From the interviews, a long distance from the nearest VMMC clinic was reported to hinder seeking VMMC services. Tchuenche, Haté, et al. (2016) found that transportation costs were the largest out-of-pocket expense while seeking VMMC and could hinder the uptake of free VMMC services in South Africa. Delays at VMMC service points, which result in missed wages and income, are other important considerations. Policymakers will need to ensure that services are closer to the communities and offered on time prior to the introduction of user fees for VMMC. Alternatively, virtual follow-up through two-way texting, which is more effective and less costly in South Africa, should be integrated with a fee-for-service VMMC (Su et al., 2023).

Knowledge about VMMC was featured prominently in the interviews. Knowledge about VMMC was found to be positively associated with VMMC. From the interviews, people were not fully aware of VMMC. Some respondents who were aware of VMMC and its benefits indicated a positive willingness to pay, since it is worthwhile. It was good to find that people not only knew the benefits for the circumcised person but also for the partner. People who had negative misconceptions and were unaware of how VMMC is performed reported an unwillingness to pay for VMMC. For instance, several people reported that they would not be willing to spend money to receive pain, indicating that they were unaware that VMMC was done under anaesthesia. A lack of knowledge has been found to affect the uptake of VMMC in other countries and willingness to pay. Sun et al. (2023) found that a lack of knowledge about VMMC hindered the uptake of VMMC among men who have sex with men in China. Mphepo et al. (2023) found that giving culturally appropriate messages and allowing communities to give

feedback on VMMC messaging improved uptake in Zambia. This approach may help improve knowledge about VMMC as part of the considerations for introducing a service fee. From Chapter 2, and as shown in Figure 2.4, knowledge was the second most common theme, with nine mentions among the factors influencing WTP. Therefore, any plan to introduce paid-for VMMC services will need to invest in increasing knowledge about the benefits of VMMC amongst targeted communities.

High perceived behaviour control ($p<0.01$) was negatively associated with the willingness to pay for VMMC services. Predictive margins for PBC were inversely related to willingness to pay for VMMC. As the level of perceived behaviour control increased, WTP decreased. Simply put, people who thought they could not pay were less likely to be willing to pay for VMMC. The decrease in WTP with increasing perceived behaviour control was re-echoed in the interviews. Respondents think there are more pressing needs, such as affording daily meals, than paying for VMMC. Perceived behaviour control is one of the factors that Ajzen (1991) postulates in his theory of planned behaviour as influencing action. In a multi-country study, Evans et al. (2019) found that perceived behaviour control influenced the willingness to pay for condoms. The findings of the current study allude to the need for different cost recovery levels. Attempts to recover the full-service cost from everyone will turn away people who believe they cannot afford the services.

7.6. Unexpected research findings

The study revealed some unexpected findings. Through the in-depth interviews, respondents shared the challenges affecting the demand for VMMC and possible solutions to address the challenges from the consumers' perspective, which were captured in two themes: the

perspective of VMMC, i.e., 1) the positive side (opportunities) and problems and concerns (deficits) about VMMC and 2) pivots and shifts for VMMC.

The deficits and opportunities of VMMC identified in this study may be classified into three broad categories. First are issues related to myths, misconceptions and beliefs about circumcision. The second is related to the healthcare system, and the third is about fears and concerns post-circumcision. The current study's findings align with those identified in a systematic review of barriers and facilitators of VMMC that reviewed studies published until 2016 (Carrasco et al., 2019). The same challenges have persisted for several years since this evidence was available, which may partially explain the failure to meet the VMMC targets set to be attained by 2016.

7.6.1. Misconceptions, myths and beliefs about VMMC

The challenges that pertain to the misconceptions, myths and beliefs about VMMC identified in this study include VMMC being considered a disguised form of contraception, VMMC being thought to affect sexual performance negatively, and it is aimed at converting Christians into Muslims. Nanteza et al. (2018) found that misconceptions about the negative impact of VMMC on sexual performance were associated with a lower prevalence of VMMC in northern Uganda. In a study conducted among commercial motorcycle riders in western Uganda, Tusabe et al. (2022) found that the fear of being converted to Islam was one of the factors hindering the uptake of VMMC. Myths and concerns about VMMC are not unique to Uganda. Moyo et al. (2015) identified similar myths in Zimbabwe. Despite several interventions to address the misconceptions about VMMC in Uganda that have been implemented (Sgaier et al., 2015), these misconceptions persist and continue to impede the scale-up of the service. In the current study, respondents think that the information about VMMC is still inadequate, and thus, there is a need to reach communities with appropriate messaging. Sgaier et al. (2015) recommend

using a multifaceted approach that involves tailored messages and reaching out to traditional leaders to act as advocates for the programme, while Byaruhanga et al. (2022) and Danda et al. (2022) recommend the involvement of women as part of strategies to address misconceptions about VMMC. Further, Zulu et al. (2022) recommend a critical analysis of stakeholders in the community that can be leveraged to improve communication about VMMC. There is a need to review the existing approaches to address VMMC misconceptions in Uganda to understand *which, what, where, who* and *how* they should be implemented if they are to be addressed.

7.6.2. Other benefits of VMMC

The respondents in the current study recommended the addition of other benefits of circumcision beyond HIV prevention to VMMC community-based messaging as a way of attracting people to seek VMMC. Whereas this might improve the uptake, it may not address the primary purpose of HIV prevention if circumcised individuals do not abandon risky HIV behaviour since the reason for seeking circumcision is not HIV prevention. VMMC programmes need to cautiously provide messaging on other benefits of VMMC beyond HIV prevention. Deliberate efforts must be made to educate people who seek VMMC based on other benefits, such as improved hygiene and HIV risk reduction, to avoid them getting exposed to HIV infection. If this is not done, there is a chance that countries such as Uganda will achieve 80% VMMC saturation but will not realise the full benefit of a reduction in HIV incidence to the extent that it would be desired.

7.6.3. Health system gaps

The second batch of deficits and opportunities identified in the current study is related to health system gaps. This study found that men do not like the current approach of using surgical camps to offer services. There is mistrust in the drugs used in surgical camps, as they

are thought to be substandard, and there is also a lack of confidence in the service providers in surgical camps. To scale up VMMC service delivery, the Uganda Ministry of Health offers VMMC services through surgical camps, typically involving intensified mobilisation of people for circumcision, followed by high-volume circumcisions. This is part of the "Models for Optimising Volume and Efficiencies" (MOVE) guidelines (WHO, 2010a). Similar to what Nxumalo and McHunu (2020) found in Kwa Zulu Natal, one of the concerns identified in this study was a lack of confidence in service providers. Whereas in the current study, we could not tell whether the service providers complained about being qualified health workers, Matumaini et al. (2021) found no difference in the rate of adverse events regarding circumcisions conducted by medical doctors and those undertaken by non-doctor health workers. Task shifting of the role of performing medical circumcision from medical doctors to other health professionals, such as nurses and clinical officers or associates, is one of the recommended strategies for scaling up VMMC, given the shortage of medical doctors in several VMMC priority countries (Ledikwe et al., 2014; Ngcobo et al., 2018). One respondent reported preferring to be circumcised at a mosque to a hospital, further underscoring the preference for experience and safety. A specific concern was raised about the lack of privacy in circumcision camps. Assuring privacy needs to be urgently addressed if the programme is to reach older males.

7.6.4. Fears and concerns post circumcision

The third category of deficits and opportunities identified by the current study is related to fears and concerns post-circumcision. Among these are the perceived fear of pain, adverse events, and costs associated with managing the adverse events. Whereas the fear of pain and actual pain during circumcision is a well-documented concern (Carrasco et al., 2019), it, unfortunately, remains unaddressed. Fear of pain remains one of the biggest concerns among

people seeking male circumcision (Hatzold et al., 2014). Respondents in the current study recommended further sensitisation and the need to let prospective VMMC clients know that the procedure is done under anaesthesia. This recommendation speaks to the importance of addressing why, how, and where VMMC is performed during community mobilisations.

Contrary to the intended benefit, some respondents thought VMMC might aid HIV transmission. Respondents cited the cultural requirement of having sexual intercourse with another woman to avoid transferring bad omens to the spouse as a way VMMC may aid HIV transmission. The concern about the need to find another sexual partner has been previously documented by Kibira et al. (2017). It is encouraging to know that people still think about HIV transmission even after circumcision because this implies that they understand the limits of VMMC as an HIV prevention intervention. Although HIV risk compensation has not been identified among circumcised clients (Kankaka et al., 2018; Ortblad et al., 2019; Spees et al., 2020), it needs to be continuously monitored.

7.6.5. Influence of subjective norms

One unexpected finding was that, whereas subjective norms were not found to be statistically significant under the quantitative component of the study, from the qualitative arm of the study, several people, including sexual partners, parents, guardians, teachers and community-based health workers, were reported to influence people deciding to undergo circumcision. Prior studies have noted the importance of subjective norms, especially sexual partners, on the uptake of VMMC. A review of the literature conducted by Danda et al. (2022) reveals that women play an essential role in influencing their partners to undergo circumcision through companion support.

7.7. Methods used in willingness-to-pay studies

As presented in Chapter 2, there is incomplete reporting on the methods used in WTP studies. The theories underpinning the studies and the methods used to elicit willingness to pay are two notable items seldom reported in the reviewed articles. There is little mention of the theoretical approaches to studies on willingness to pay for HIV services in Africa. Only one study about WTP for HIV services in Nigeria explicitly stated the theory underpinning the research (Adekunjo et al., 2020), while another (Chirundu et al., 2017) states the conceptual framework but not the theory. An appropriate theory should guide research (Osanloo & Grant, 2016b). This gap has been addressed in the current research. The economic theory and the theory of planned behaviour were applied. Using theories made framing the study concepts and identifying the study variables easier.

The current study applied two theories. The economic theory postulates that rational, forward-thinking individuals consume products or services that enhance their welfare while expending minimally (Culyer, 1989). The economic theory was a natural fit for the current study since the willingness to pay is grounded in it. When people think about paying for goods or services such as VMMC, their options and responses are constrained by their disposable incomes and the opportunity cost of their choices (Liebe et al., 2011). The two variables of income and knowledge (low) identified from the economic theory were associated with the willingness to pay for VMMC. The second theory applied in the study was the theory of planned behaviour, which postulates that behaviour intention, for instance, paying for voluntary medical male circumcision, is a function of the attitude towards the object or service, the influence of subjective norms and perceived behaviour control (Ajzen, 1991). The current study finds that only perceived behaviour control significantly influenced the WTP for VMMC with an inverse

relationship. The mixed findings from the qualitative interviews regarding attitudes, beliefs and influence of peers may explain why these factors were not significant. For example, some people had a positive belief that circumcision enhances sexual pleasure, while others thought it is the opposite. The theory of planned behaviour offered a good framework for investigating the WTP for VMMC. Overall, the two theories applied with a pragmatic philosophical approach were appropriate for framing the current study. The available evidence indicates incomplete documentation of the method for eliciting WTP. Only 17 of the 22 quantitative studies (77.3%) fully mentioned the elicitation method for obtaining the WTP. The bidding game was the most common (7/12, 58%) method used among the retrieved articles, similar to what other studies have found. The current study applied the bidding game approach to elicit maximum willingness to pay. Other than being the commonly used approach, as noted in Chapter 2, and having been used in similar studies (Steigenberger et al., 2022a), it was used in the current study because it was also the most feasible approach for virtual data collection.

One of the gaps identified in Chapter 2 is the scant literature on the ability to pay. Amongst the articles in the systematic review, only one study by Wandei et al. (2016) reports on the ability to pay. In most studies, WTP is assumed to be synonymous with ATP (Russell, 1996). Paying for healthcare can cause financial impoverishment, with some people forced into extreme destitution in less-developed nations (Sirag & Mohamed Nor, 2021). Therefore, the ability to pay must be assessed for all services where cost recovery is considered, and WTP must not just be assumed to ATP. Targeting low-income groups through increases in government expenditures on healthcare and pro-poor prioritisation of expenditures can reduce disparities between income groups and protect those who cannot pay (Ntembe et al., 2021).

7.8. Strengths and limitations of the research study

7.8.1. Strengths of the study

The strength of the present research lies in the use of mixed methods to study willingness to pay for VMMC. Before the current research, the only documented willingness to pay for VMMC study used a quantitative design and left unanswered questions about the decisions that inform WTP choices. Using a mixed methods design, the current research answered some of the questions generated from the work of Wandei et al.

The other strength of the current research is the study population. Previous research on payment for VMMC services by Wandei et al. (2016) and Tchuenche, Haté, et al. (2016) surveyed household heads as the primary respondents, while the current study only surveyed adult males. Adult male circumcision, which VMMC is, is a private matter (Adams et al., 2022). It is doubtful that attention would be given at the household level when the opportunity cost is high. However, if adult individuals find utility in VMMC, they will likely be willing to pay for the service, even though it might have a high opportunity cost. Finally, it assessed the ability to pay for a health service, a topic several previous studies have not covered.

Income is documented to influence willingness to pay. The current study was conducted during COVID-19, when the country's economic situation was low, with several people out of employment. As revealed by the findings, only 16% of the respondents had paid employment, with the rest either self-employed or unemployed. It is, therefore, likely that the elicited willingness to pay amount may approximate the actual amount people would be willing to pay in real life, thus a strength for this study.

7.8.2. Limitations of the study

One of the limitations of this study was that it only explored the demand side of VMMC and did not explore the challenges and possible solutions from the supply side of VMMC. As noted by Kiyai et al. (2023) several missed opportunities from the supply side for scaling up VMMC exist, which could be the key to meeting VMMC targets and identifying the factors associated with willingness to pay for VMMC.

Owing to the prevailing COVID-19 restrictions, when the study was conducted, participants were recruited from an existing database, and data collection was conducted virtually through phone call interviews. Although it was not the expectation that all people would be able and willing to pay for VMMC, there is a chance that the study population may not have been fully representative of the general population since they all possessed or had a phone contact at which they could be reached, which might be a reflection of a better socio-economic status compared to the general population. This factor might positively bias the willingness to pay.

Adult circumcision is a relatively private matter; thus, some people may feel uncomfortable discussing it. There is a possibility that such discomfort could have influenced the findings of the current study. On a personal note, listening to some of the responses from the respondents, especially the myth about the intention of the government conducting VMMC to control population growth and the reason why the foreskin is not given to the clients because it contains a particular chemical left me astonished and in disbelief on the impact of misconceptions negatively affecting the uptake of health services. The respondents could not get a hint on how I reacted to such statements thanks to virtual data collection, but I also

missed getting their non-verbal communication, which would have added more meaning to the findings.

Although respondents were informed to consider other essential expenses they incur before setting their maximum willingness to pay offers for VMMC, and in spite of the study being conducted at a time when the country's economic situation was low, this study still found some participants willing to pay as high as UGX300,000 (£63.3). Contingent valuation studies have the limitation of eliciting unreasonable or unrealistic offers from participants that they would not pay in a real market. This study is no exception to this limitation.

8. CONCLUSIONS

8.1. Introduction

At the start of this PhD study, the sustainability of donor-funded HIV services was not as prominent as it has recently become. PEPFAR, the leading donor of HIV services, has since developed "*PEPFAR's Five-Year Strategy, Fulfilling America's Promise to End the HIV/AIDS Pandemic by 2030*" (PEPFAR, 2023). The second strategic pillar of this strategy, "Sustaining the Response," focuses on sustaining PEPFAR's HIV and AIDS response, highlighting the importance of sustainability. Section 8.2 presents the major conclusions from the current research and explains how the research questions posed in Section 1.3.3 have been fully answered. Section 8.3 covers the implications of the present study. The chapter concludes with recommendations for policymakers and highlights new research areas that have come to light while conducting this research in Section 8.4.

8.2. Conclusions

The current study aimed to determine the ability and willingness to pay for VMMC. There is an opportunity to recover costs from donor-supported public health HIV prevention services, including voluntary medical male circumcision. This research confirms the ability and willingness to pay for VMMC. However, service delivery modifications are required to suit the needs of prospective consumers before considering the introduction of a fee-for-service VMMC.

The cost of VMMC is essential in determining willingness to pay for it. The introductory fee for VMMC should not exceed UGX100,000 (£21.10) since the majority (88%) of the respondents

are not willing to pay an amount higher than this. The amount set should include costs for the actual surgical procedure and any postoperative care that might be required. Furthermore, the prevailing economic situation and the opportunity costs associated with paying for VMMC need to be considered when setting the cost of VMMC.

Whereas VMMC is a one-off service and unlikely to drive people into financial impoverishment by paying for it, it is essential that the individual's ability to pay is put into perspective and that the fee-for-service VMMC is offered equitably. The current research found that people with a university-level education and those who thought they had the means to pay were more willing to pay, while the less the level of education that one had, the more unlikely they were willing to pay for VMMC. Furthermore, people living in rural areas, as well as students and low-income earners, were less willing to pay for VMMC. Therefore, the cost of VMMC needs to be deliberately segmented based on the ability and willingness of people to pay for it.

The ability to pay and willingness to pay for VMMC are insufficient to translate into a successful fee-for-service VMMC. Several factors need to be addressed. Among these is the quality of VMMC services. The technical skills of VMMC service providers, the ambience and privacy within VMMC clinics, and the quality of drugs used are among the attributes people value in determining whether to pay for VMMC. The current service delivery approach of offering services in a camp model, where mobilization precedes service delivery, appears unpopular and should be reconsidered.

Despite VMMC being a cost-effective HIV prevention intervention, its scale-up remains challenging. Myths and misconceptions, health system-related challenges, and fear of what happens post-circumcision continue to hinder its scale-up. Adult males have proposals for addressing the challenges that should be further explored by the Uganda Ministry of Health

and other stakeholders supporting VMMC. Among the proposals are better disseminating information about VMMC in the community using trusted people such as health service providers and targeting parents and teachers, bringing the service closer to the people, and offering the service at a time convenient for people but not available in the routine business hours, and re-assuring people that the procedure is conducted under anaesthesia, and thus painless.

The use of the willingness-to-pay metric as a tool for valuing benefits for HIV services in general and VMMC remains limited and incomplete in Africa. Few studies have been conducted using WTP in countries other than Nigeria and Kenya. Furthermore, the use of WTP to investigate HIV prevention services remains very limited, with a handful of studies conducted to date on various HIV prevention services. Reporting WTP studies remains incomplete, with just a handful of studies fully reporting the theories underpinning the studies, the type of statistical analysis conducted, and the factors influencing WTP decisions.

8.3. Study implications and contribution

This study contributes to the knowledge of the willingness to pay for HIV services. Only one documented study on the willingness to pay for VMMC services existed when this study was conducted. The study conducted by Wangei et al. did not explore the factors that inform willingness-to-pay decisions. The current study has bridged this gap and provides additional considerations that policymakers should consider before introducing a fee-for-service VMMC.

This study documents what needs to be considered when planning a fee-for-service VMMC. The contingent valuation method facilitates determining the prices at which health technologies can be introduced into the market (Hanley, Ryan, & Wright, 2003). As one of the

advantages of contingent valuation methods, this study identifies how much people are willing to pay for VMMC. This will provide a benchmark for the introduction of a fee-for-service VMMC.

The study addresses several methodological gaps identified in previously documented studies on willingness to pay for HIV and AIDS services in Africa. Chapter 2 observed the limited use of theory to inform WTP studies and reported on the approach used to elicit the maximum willingness to pay the amount. The current study contributes to and improves the application of the WTP tool to health research.

The current study contributes to the methodological literature on contingent valuation by demonstrating the application of virtual data collection in a mixed-method HIV prevention contingent valuation study.

While this study was conducted in Uganda, its findings have broad implications for other VMMC-priority countries. The qualitative component of the study uncovers critical shortcomings in the current VMMC program that are likely to be applicable to other African countries targeting similar populations. However, the study's quantitative findings should be interpreted with caution, as they are influenced by factors such as income, social and economic status, and taxation policies that vary across countries.

8.4. Recommendations and future research

8.4.1. Recommendations

The Uganda Ministry of Health and VMMC-implementing organizations could explore the option of introducing a fee-for-service VMMC. This approach could help ensure the

sustainability of VMMC services, reducing dependence on donor support. However, it's crucial to consider the needs of those who cannot afford the fee and provide them with fully subsidized services. In any case, the cost for VMMC should be affordable, not exceeding UGX100,000 (£21.10) per person, including post-operative care.

Further, the Uganda Ministry of Health and organizations implementing VMMC could modify the current VMMC services to address quality gaps and respond to myths and misconceptions about VMMC. In addressing these challenges, considerations about the "*who*", *"where", "when"*, and "*how*" fee-for-service VMMC is implemented are crucial in remediating the challenges.

The ability to pay for healthcare is not well documented and is often construed as the same as the willingness to pay. The current research contributes to the academic debate on whether ATP is the same as WTP by clearly indicating that the two are distinct. For all health services where out-of-pocket payment is planned, it is recommended that the ability to pay be determined, even when people indicate a willingness to pay, before requesting that people pay, in order to prevent financial impoverishment from seeking healthcare.

Despite WTP being a useful tool for determining introductory prices for new products and services, its use remains limited in Africa. Further use of the tool is recommended. However, studies that use the willingness-to-pay tool should endeavour to include and report on the theories underlying them and the method used to elicit the maximum willingness-to-pay amounts.

8.4.2. Future research work

The current study explored the factors influencing the willingness to pay for VMMC from the demand perspective. A high willingness to pay for VMMC was identified, albeit with several health system gaps that need to be addressed before introducing a fee-for-service VMMC. Further research is needed to explore the supply-side factors influencing willingness to pay for VMMC. The views of VMMC service providers, decision-makers at the Ministry of Health and donors currently supporting the free VMMC service would be crucial in further informing how fee-for-service VMMC can be introduced and implemented.

Further research is needed to fully understand WTP decisions and how opportunity cost influences willingness to pay for VMMC. The current study assessed the willingness to pay the direct costs of VMMC and did not delve into opportunity costs. Showing up for VMMC involves foregoing a lot, including missed wages and income, transportation, and other hidden expenses.

Lastly, if the Ministry of Health decides to pursue fee-for-service VMMC in Uganda, it is recommended that implementation science research be conducted to determine how best to initiate the services. Such research could address whether to start fee-for-service VMMC through private clinics or public ones. Preferably, the study should use a qualitative design with a realist approach (Pawson & Tilley, 1997) to explore how best to introduce the services working with prospective VMMC clients.

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APPENDICES

Appendix A: Search terms for the willingness to pay for HIV and AIDS services in Africa

Theme	Search terms
Willingness to pay	"Willingness to pay" or "Contingent valuation" or WTP or CVM
HIV and AIDS	hiv or hiv-1* or hiv-2* or hiv1 or hiv2 or human immunodeficiency virus or human immunodeficiency virus or human immuno-deficiency virus or human immune-deficiency virus or (human immun* and deficiency virus) or acquired immunodeficiency syndrome or acquired immunodeficiency syndrome or acquired immuno-deficiency syndrome or acquired immune-deficiency syndrome or (acquired immun* and deficiency syndrome) or AIDS
Africa	Africa OR British Indian Ocean Territory or Angola or B?nin or Botswana or Burkina Faso or Burundi or Cabo Verde or Cape Verde or Camero?n or Central African Republic or CAR or Republique centrafricaine or Centrafrique or Chad or Republique du Tchad or Comor?s or Komori or Congo or Congo-Brazzaville or Cote d?Ivoire or Ivory Coast or DRC or DROC or Congo-Kinshasa or Zaire or Djibouti or Equatorial Guinea or Guinea Ecuatorial or Guinee equatorial or Guine Equatorial or Eritrea or Ethiopia or French Southern 'and' Antarctic or TAAF or Gabon* or Republique gabonaise or Gambia or Ghana or Guinea or Republique de Guinee or Guinea-Bissau or Republica da Guine-Bissau or Kenya or Lesotho or Liberia or Madagascar or Madagasikara or Malawi or Mali or Mauritania or Mauritius or Republique de Maurice or Mayotte or

	Mozambique or Namibia or Niger or Nigeria or Reunion or Rwanda or S?o Tom? 'and' Pr?ncipe or Sao Tome e Principe or Saint Helena or S?n?gal or Seychelles or Sesel or Sierra Leone or Somalia or South Africa or RSA or South Sudan or Swaziland or kaNgwane or Togo* or Uganda or Tanzania or Zambia or Zimbabwe

Appendix B: Methodological assessment for quality using JBI analytical cross-sectional studies

Paper	Were the criteria for inclusion in the sample clearly defined?	Were the study subjects and the setting described in detail?	Was the exposure measured in a valid and reliable way?	Were objective, standard criteria used for measurement of the condition?	Was appropriate statistical analysis used?	Overall appraisal
Uzochukwu et al. (2011)	Yes	Yes	Yes	Yes	Yes	Include
Adekunjo et al. (2020)	Yes	Yes	Yes	Yes	Yes	Include
Evans et al. (2019)	Yes	Yes	Yes	Yes	Yes	Include
Muko et al. (2004)	Yes	Yes	Yes	Yes	Unclear	Include
Forsythe et al. (2002)	Yes	Yes	Yes	Yes	Unclear	Include
Dim et al. (2015)	Yes	Yes	Unclear	Yes	Yes	Include
Geldsetzer et al. (2020)	Yes	Yes	Yes	Yes	Yes	Include
Mbachu et al. (2018)	Yes	Yes	Yes	Yes	Yes	Include
Evans et al. (2019)	Yes	Yes	Unclear	Yes	Yes	Include
Thirumurthy et al. (2018)	Yes	Yes	Unclear	Yes	Yes	Include
Begnel et al. (2020)	Yes	Yes	Unclear	Yes	Unclear	Include
Chiu et al. (2021)	Yes	Unclear	Yes	Yes	Unclear	Include
Ashburn et al. (2020)	Yes	Yes	Unclear	Yes	Yes	Include
Chirundu et al. (2017)	Yes	Yes	Unclear	Yes	Yes	Include
Ayifah and Ayifah (2012)	Unclear	Yes	Yes	Unclear	Yes	Include
Wandei et al. (2016)	Yes	Yes	Unclear	Yes	Yes	Include
Isah et al. (2019)	Yes	Yes	Yes	Yes	Yes	Include
Nwobi et al. (2017)	Unclear	Yes	Yes	Yes	Yes	Include
Isah et al. (2021)	Yes	Yes	Yes	Yes	Yes	Include
Durosinmi-Etti et al. (2022)	Yes	Yes	Yes	Yes	Yes	Include
Otiso (2016)	Yes	Yes	Yes	Yes	Yes	Include

Qualitative paper (JBI Checklist for qualitative research)

Paper	Congruity between philosophy and methodology	Congruity between methodology and methods	Influence of researcher addressed	Participant voice represented	Ethical approval	Overall appraisal
Twimukye et al. (2017)	Yes	Yes	Unclear	Yes	Yes	Include

4-5 Yes =High quality, 2-3 Yes =Medium quality, 0-1 Yes= Low quality

Appendix C: Data extracted from papers.

	Study	Country	Objective	Population	Sample size	Survey method	Elicitation method	Statistical analysis
1	Uzochukwu et al. (2011)	Nigeria	WTP for VCT	Students of tertiary institution	500	Interviewer administered questionnaire	Bidding game	OLS regression
2	Adekunjo et al. (2020)	Nigeria	WTP for HCT services	The general population, aged >20 years	768	Face to face interview	Payment card	Linear regression
3	Evans et al. (2019)	Kenya, Nigeria, South Africa, Zambia, and Zimbabwe	WTP for male condoms	Males 18-49 who are condom users	6566	Face to face interviews using electronic equipment	Bidding game	Linear regression
4	Muko et al. (2004)	Cameron	WTP for ART	Patients attending a rural hospital	84	Face to face interviews using structured and semi structured open-ended questions	Bidding game	-
5	Forsythe et al. (2002)	Kenya	WTP for HCT	VCT clients	748	Face to face interviews	Payment card	-
6	Dim et al. (2015)	Nigeria	WTP for cervical cancer screening	HIV positive women	400	Face to face interview using structured questionnaire	-	Odds ratio

7	Geldsetzer et al. (2020)	Tanzania	WTP for community ART delivery	ART patients	1799	Face to face interview	Payment Card	Poisson regression
8	Mbachu et al. (2018)	Nigeria	WTP for ARVs	Clients on ART	125	Face to face interviews using a structured questionnaire	Bidding game	OLS multiple regression
9	Evans et al. (2019)	Zimbabwe	WTP for brand condoms	Condom users	890	Face to face interview using structured electronic questionnaire	-	Logistic regression
10	Thirumurthy et al. (2018)	Kenya	WTP for HIV test kits	Women attending ANC and PNC clinics	297	Face to face interviews	-	Poisson regression & OLS regression
11	Begnel et al. (2020)	Kenya	WTP for PrEP	General population	3825	Automated SMS self-administered	-	-
12	Chiu et al. (2021)	Tanzania	WTP to restock HIV test kits	Drug shop owners	26	Face to face interviews	Multiple price list	Linear regression
13	Ashburn et al. (2020)	Cote d'Ivoire and Tanzania	WTP for HIV self-test kits	ANC clients and pharmacists	799	Face to face using structured using electronic questionnaire	-	Regression
14	Chirundu et al. (2017)	Zimbabwe	WTP for ART	ART clients	552	Face to face administered questionnaire	-	Logistic regression

15	Ayifah and Ayifah (2012)	Ghana	WTP for PMTCT	ANC clients	200	Face to face interviews	Open ended bidding	Logistic regression
16	Twimukye et al. (2017)	Uganda	WTP to attend an afterhours HIV clinic	ART patients and staff at the ART clinic	188	14 FDGs and 55 in-depth interviews	N/A	Thematic content analysis
17	Wandei et al. (2016)	Kenya	Determine the WTP for VMMC	Household heads	384	Face to face interview	-	Logistic regression
18	Isah et al. (2019)	Nigeria	WTA & WTP for PMTCT	PMTCT patients	104	Face to face using a structured questionnaire	Payment care with open minimum and maximum	Linear regression
19	Nwobi et al. (2017)	Nigeria	WTP for ART and HIV treatment monitoring	ART patients	400	Face to administered questionnaire	Structured haggling	Binary logistic regression
20	Isah et al. (2021)	Nigeria	Wtp for PMTCT	PMTCT patients	219	Face to face administered questionnaire	Payment card	Chi square, t-test
21	Durosinmi-Etti et al. (2022)	Nigeria	WTP for HIVST, PrEP and Condoms	PLHIV	400	Interviewer administered semi-structured questionnaire	Bidding game	Logistic regression
22	Otiso (2016)	Kenya	WTP for HIV care services	PLHIV	337	Self-administered questionnaire	Bidding game	Logistic Regression

Questionnaire number: ……..

Date: ……..

Name of the interviewer: ……..

READ out the information sheet for the participant, administer and obtain consent prior to completing this questionnaire.

QUESTIONNAIRE

ABILITY AND WILLINGNESS TO PAY FOR VOLUNTARY MEDICAL MALE CIRCUMCISION IN UGANDA: A MIXED-METHODS STUDY

SECTION 1: DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

1. Age in years [ ]
2. Marital status: Married [ ], Single[ ] Divorced [ ], Separated[ ] Widow[ ].
3. Do you belong to a tribe that does traditional circumcision? 1=Yes; [ ] 0=No [ ]
4. Religion: Christianity [ ], Islam [ ], African tradition [ ], others specify…….
5. Educational attainments completed: primary school [ ], secondary school [ ], tertiary [ ], no formal education [ ].
6. Employment status: Unemployed [ ], Paid Employment [ ], Student [ ], Self-employed [ ]
7. Do you have any dependents: 1=Yes; [ ] 0=No [ ]
8. If you have dependents, how many: 1-2 [ ], 3-5 [ ], >5 [ ]
9. Where do you stay: Urban Centre [ ], Rural Area [ ]

SECTION 2: Knowledge, attitude, beliefs, subjective norms, and perceived behaviour about VMMC.

Knowledge

10. Do you think you know how HIV is spread?

Strongly Agree Agree Neutral Disagree Strongly Disagree

11. Do you think your HIV has affected your family?

Strongly Agree Agree Neutral Disagree Strongly Disagree

12. Have you lost a close relative or friend to HIV?

1=Yes; [ ] 0=No [ ]

13. Have you heard about male circumcision that is done to prevent HIV prevention?

1=Yes; [ ] 0=No [ ]

Attitudes

14. Are you circumcised? 11=Yes; [ ] 0=No [ ]: [ ].
15. If yes, were you circumcised less than 1 year ago? 1=Yes; [ ] 0=No [ ] if no, go to qtn 17
16. What is the single most important reason that made you get circumcised?
    1) Prevent HIV 2) Hygiene 3) Prevent other diseases 4) Requested by my friends or wife 5) Improve sexual performance 6) I don't know 7) Other.
17. If not circumcised, would you consider getting circumcised?

1=Yes; [ ] 0=No [ ]

18. Do you think the quality of service was good?

1=Yes; [ ] 0=No [ ]

19. Would you recommend anyone to go for circumcision?

Strongly Agree Agree Neutral Disagree Strongly Disagree

Subjective norms

20. There are people close to you who requested or who have requested you to get circumcised.

Strongly Agree Agree Neutral Disagree Strongly Disagree

21. What other people think about your circumcision status is important to you.

    Strongly Agree Agree Neutral Disagree Strongly Disagree

    Perceived behaviour control

22. On your own, are you able to make the decision to get circumcised or not?

    Strongly Agree Agree Neutral Disagree Strongly Disagree

23. Do you think male circumcision should be paid for?

    Strongly Agree Agree Neutral Disagree Strongly Disagree

24. I have resources to pay for male circumcision.

    Strongly Agree Agree Neutral Disagree Strongly Disagree

    Beliefs

25. Do you believe that male circumcision prevents HIV transmission?

    Strongly Agree Agree Neutral Disagree Strongly Disagree

26. I believe that circumcision is good for me.

    Strongly Agree Agree Neutral Disagree Strongly Disagree

SECTION 3: WILLINGNESS TO PAY FOR VMMC

Voluntary medical male circumcision (VMMC) prevents the transmission of HIV from an HIV-positive woman to an HIV-negative man by up to 60%. It is one of the HIV prevention measures recommended by the Ministry of Health and World Health Organization. If 80% of males aged 15 to 49 years in Uganda are circumcised, up to 125,000 new HIV infections would be prevented. It also reduces the chance of a man getting other sexually transmitted infections, such as syphilis and herpes. It provides protection against cancer of the penis and reduces the chances of cancer of the cervix (the leading killer cancer in Africa) in the spouses of circumcised men. It also improves hygiene in males.

27. VMMC is currently offered free of charge as one of the main methods for the prevention of HIV. If the free VMMC was no longer available and you were asked to pay for it, would you be willing to pay? 1= yes, 0=no. [ ]. If yes, go to 29.

28. What is the reason for your unwillingness to pay?

    a. I cannot pay.

    b. I object to paying for any form of healthcare.

    c. I cannot pay, and I object to pay.

    d. I do not see any value for VMMC.

29. The cost of VMMC is 45,000. Would you be willing to pay it? 1= yes, 0=no. [ ], do not know [ ].

30. What is the maximum amount you would be willing to pay? *(Interviewer: If less than 45,000 go to Qtn 33)* [ ].

31. What if the cost of VMMC is 100,000? Would you be willing to pay? 1= yes [ ], 0=no [ ].

32. If due to inflation or other uncertainties, the cost of the VMMC increases, what is the maximum amount you are very certain to pay bearing in mind your average monthly household income and money you spend on other items? [ ].

33. The amount that you have quoted is too low and cannot cover the cost of VMMC, so you will have to increase the amount if you really want to be circumcised. So, what is the final maximum amount you are willing to pay to be circumcised? [ ]. (No matter the answer, go to Q34).

34. What really is the maximum amount you would be willing to pay for the VMMC? [ ].

SECTION 4: HOUSEHOLD INCOME, ASSETS AND EXPENDITURE.

35. Could you tell me if your household has any of the following and if they are functional? 1=yes. 0=no.

Electricity	[_____]
Radio	[_____]
Refrigerator	[_____]
Television	[_____]
Mobile phone	[_____]

Gas cooker	[_____]
Bicycle	[_____]
Motorcycle	[_____]
Motorcar	[_____]
Kerosene lamp	[_____]
Generator	[_____]
Rechargeable lamp	[_____]
Electric iron	[_____]
Electric fan	[_____]

36. Do you work outside the home? 1=Yes; [ ] 0=No [ ]

37. On average, how much do you earn per month?

a. Less than 200,000/=

b. 200,000 – 500,000/=

c. 500,000 – 1,000,000/=

d. >1,000,000/=

38. What is your family's total income per month? (*Probe all sources of income. Amount must be greater than or equal to Qtn28)*

e. Less than 200,000/=

f. 200,000 – 500,000/=

g. 500,000 – 1,000,000/=

h. >1,000,000/=

39. How much do you spend to reach your nearest VMMC service point? [ ]

40. On average, how much do you spend on all the expenses that you incur per month? [ ]

Thank you.

READ out the information sheet for the participant, administer, and obtain consent prior to completing this questionnaire.

Ability and willingness to pay for voluntary medical male circumcision in Uganda: A mixed methods study.

Questionnaire number: ……..

Date: ……..

Name of the interviewer: ……..

Demographics

41. Age in years [ ]
42. Marital status: Married [ ], Single[ ] Divorced [ ], Separated[ ] Widow[ ].
43. Do you belong to a tribe that does traditional circumcision? 1=Yes; [ ] 0=No [ ]
44. Religion: Christianity [ ], Islam [ ], African tradition [ ], others specify…….
45. Educational attainments completed: primary school [ ], secondary school [ ], tertiary [ ], no formal education [ ].
46. Employment status: Unemployed [ ], Paid Employment [ ], Student [ ], Self-employed [ ]
47. Do you have any dependents: 1=Yes; [ ] 0=No [ ]
48. If you have dependents, how many: 1-2 [ ], 3-5 [ ], >5 [ ]
49. Where do you stay: Urban Centre [ ], Rural area [ ]

Semi-structured individual interview guide

1. What is your attitude about male circumcision in preventing HIV transmission? Please elaborate.

2. Male circumcision is now offered free of charge. If there was no money to offer it free of charge, do you believe that male circumcision should be paid for? Elaborate
3. Would you be willing to pay for male circumcision? (Explore the reasons why the participant is willing or not willing to pay.)
4. Do you have any worries about circumcision being paid for? Elaborate
5. Do you have some people who are close to you (e.g., wife, girlfriend, friends, siblings) who have told you to get circumcised? elaborate?
6. Do you think advice from such people is important to you? Elaborate
7. Would be interested in getting circumcised, if not already?
8. Have you already received VMMC? If yes, were you happy with the quality of service that you received? (Probe what was good or bad)
9. If yes to 2 above, do you think the quality of service that you received influenced your decision?
10. Is there anything else you want to tell me?

Lancaster University

Applicant: John Byabagambi
Supervisor: Prof Bruce Hollingsworth and Dr Mark Limmer
Department: DHR
FHMREC Reference: FHMREC20119

09 August 2021

Re: FHMREC20119
Ability and willingness to pay for voluntary medical male circumcision in Uganda: A mixed methods study

Dear John,

Thank you for submitting your research ethics application for the above project for review by the **Faculty of Health and Medicine Research Ethics Committee (FHMREC).** The application was recommended for approval by FHMREC, and on behalf of the Chair of the Committee, I can confirm that approval has been granted for this research project.

As principal investigator your responsibilities include:

- ensuring that (where applicable) all the necessary legal and regulatory requirements in order to conduct the research are met, and the necessary licenses and approvals have been obtained;
- reporting any ethics-related issues that occur during the course of the research or arising from the research to the Research Ethics Officer at the email address below (e.g. unforeseen ethical issues, complaints about the conduct of the research, adverse reactions such as extreme distress);
- submitting details of proposed substantive amendments to the protocol to the Research Ethics Officer for approval.

Please contact me if you have any queries or require further information.

Email: fhmresearchsupport@lancaster.ac.uk

Yours sincerely,

T. Morley

Tom Morley,
Research Ethics Officer, Secretary to FHMREC.

MILDMAY UGANDA

Research Ethics committee (MUREC)

24/09/2021

To: John Byabagambi

Lancaster University
0772471421

Type: Initial Review

Re: MUREC-2021-50: Ability and willingness to pay for voluntary medical male circumcision in Uganda: A mixed-methods study, 3, 2021-09-09

I am pleased to inform you that at the **67th** convened meeting on **22/09/2021**, the Mildmay Uganda REC (MUREC), committee meeting, etc voted to approve the above referenced application.
Approval of the research is for the period of **24/09/2021** to **24/09/2022.**

As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for re-review and approval **prior** to the activation of the changes.
3. Reports of unanticipated problems involving risks to participants or any new information which could change the risk benefit: ratio must be submitted to the REC.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Continuing review application must be submitted to the REC **eight weeks** prior to the expiration date of **24/09/2022** in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by Mildmay Uganda REC (MUREC):

No.	Document Title	Language	Version Number	Version Date
1	Informed Consent forms	Lusoga	3	2021-09-09
2	Informed Consent forms	Runyakitara	3	2021-09-09
3	Informed Consent forms	Acholi	3	2021-09-09
4	Informed Consent forms	Luganda	3	2021-09-09
5	Informed Consent forms	English	3	2021-09-09
6	Protocol	English	3	2021-09-09
7	Data collection tools	Lusoga	3	2021-09-09
8	Data collection tools	Runyankole/Rukiga	3	2021-09-09
9	Data collection tools	Acholi	3	2021-09-09
10	Data collection tools	Luganda	3	2021-09-09
11	Data collection tools	English	3	2021-09-09
12	Data collection tools	Runyankole/Rukiga	3	2021-09-09
13	Data collection tools	Luganda	3	2021-09-09
14	Data collection tools	Lusoga	3	2021-09-09
15	Data collection tools	Acholi	3	2021-09-09
16	Data collection tools	English	3	2021-09-09

Yours Sincerely

Susan Nakubulwa
For: Mildmay Uganda REC (MUREC)

MILDMAY UGANDA

Research Ethics Committee (MUREC)

22 March 2023

John Byabagambi
Principal Investigator

Dear John,

Re: Renewal of the study titled: #MUREC-2021-50 "Ability and willingness to pay for voluntary medical male circumcision in Uganda: A mixed-methods study".

Thank you for submitting the progress report for the above study to MUREC.

This is to inform you that after review of your progress report dated 14th December 2022, MUREC approval has been given for you to continue with your study for another one year up to 24th September 2023: at that time, MUREC would expect you to submit a progress report and request for renewal, prior to the expiry date, to allow timely review.

Kindly share the progress report with Uganda National Council for Science and Technology (UNCST).

Yours Sincerely

MILDMAY UGANDA RESEARCH ETHICS COMMITTEE (MUREC)
APPROVED
VALID UNTIL
24 SEP 2023
P. O. BOX 24985,
KAMPALA, UGANDA

Ms. Susan Nakubulwa
Chairperson

Location/Correspondence
Mildmay, Uganda
Plot 27, Lweza
P.O Box 24985, Kampala

Communication
Tel: 0392174236
Email:murec@mildmay.or.ug
www.mildmay.org/uganda

Guiding Research For the Future

Uganda National Council for Science and Technology

(Established by Act of Parliament of the Republic of Uganda)

Our Ref: HS1523ES **8 October 2021**

John Byabagambi
International Growth Research and Evaluation Center
Kampala

Re: Research Approval: **Ability and willingness to pay for voluntary medical male circumcision in Uganda: A mixed-methods study**

I am pleased to inform you that on **08/10/2021**, the Uganda National Council for Science and Technology (UNCST) approved the above referenced research project. The Approval of the research project is for the period of **08/10/2021** to **08/10/2022**.

Your research registration number with the UNCST is **HS1523ES**. Please, cite this number in all your future correspondences with UNCST in respect of the above research project. As the Principal Investigator of the research project, you are responsible for fulfilling the following requirements of approval:

1. Keeping all co-investigators informed of the status of the research.
2. Submitting all changes, amendments, and addenda to the research protocol or the consent form (where applicable) to the designated Research Ethics Committee (REC) or Lead Agency for re-review and approval **prior** to the activation of the changes. UNCST must be notified of the approved changes within five working days.
3. For clinical trials, all serious adverse events must be reported promptly to the designated local REC for review with copies to the National Drug Authority and a notification to the UNCST.
4. Unanticipated problems involving risks to research participants or other must be reported promptly to the UNCST. New information that becomes available which could change the risk/benefit ratio must be submitted promptly for UNCST notification after review by the REC.
5. Only approved study procedures are to be implemented. The UNCST may conduct impromptu audits of all study records.
6. An annual progress report and approval letter of continuation from the REC must be submitted electronically to UNCST. Failure to do so may result in termination of the research project.

Please note that this approval includes all study related tools submitted as part of the application as shown below:

No.	Document Title	Language	Version Number	Version Date
1	Consent form	English	09/09/21	09 September 2021
2	Data collection tool	English	09/09/21	09 September 2021
3	Project Proposal	English	1	
4	Approval Letter	English		
4	Approved Informed Consent Forms	English, Luganda, Runyankore, Lusoga, Acholi	09/09/2021	09 September 2021
5	Introductory Letter from IGREC	English	09/09/2021	09 September 2021
6	Qualitative data collection tool (interview guide)	English, Luganda, Runyankore, Lusoga, Acholi	09/09/2021	09 September 2021
7	GCP Training	English	09/09/2021	09 September 2021

Yours sincerely,

Hellen Opolot
For: Executive Secretary
UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

LOCATION/CORRESPONDENCE

Plot 6 Kimera Road, Ntinda
P.O. Box 6884
KAMPALA, UGANDA

COMMUNICATION

TEL: (256) 414 705500
FAX: (256) 414-234579
EMAIL: info@uncst.go.ug
WEBSITE: http://www.uncst.go.ug

Appendix G: Characteristics of respondents for qualitative interviews

Participant ID	Age	Marital status	Education	Residence
P#01	28	Single	S.4	Peri Urban
P#02	38	Single	S1	Urban
P#03	31	Single	Diploma	Rural
P#04	39	Single	P.7	Urban
P#05	25	Single	Tertiary	Peri Urban
P#06	19	Single	S.6	Urban
P#07	31	Married	A 'Level	Rural
P#08	29	Separated	P.7	Urban
P#09	27	Single	P.7	Peri Urban
P#10	20	Single	S.3	Urban
P#11	22	Separated	S.4	Rural
P#12	32	Single	University	Urban
P#13	27	Married	None	Peri Urban
P#14	26	Single	Diploma	Urban
P#15	29	Single	University	Rural
P#16	29	Single	S.6	Urban
P#17	28	Married	None	Urban
P#18	33	Married	P.6	Rural
P#19	23	Single	P.5	Peri Urban
P#20	18	Single	S.4	Urban
P#21	31	Married	Certificate	Rural
P#22	25	Single	Tertiary	Urban
P#23	30	Married	Certificate	Rural
P#24	37	Single	Certificate	Urban
P#25	20	Single	Tertiary	Peri Urban
P#26	24	Single	Primary	Urban
P#27	21	Single	University	Rural
P#28	21	Separated	Primary	Rural
P#29	35	Married	Certificate	Rural