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Healthcare providers' knowledges, attitudes and practices towards medical male circumcision and their understandings of its partial efficacy in HIV prevention: Qualitative research in KwaZulu-Natal, South Africa

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Abstract

Background—Medical male circumcision has been shown to reduce HIV transmission to an uninfected male partner. In South Africa, medical male circumcision programs were rolled-out in 2010.

Objectives—Prior to roll-out, we explored healthcare providers' knowledge, attitudes and practices about medical male circumcision and their understandings of partial efficacy for HIV prevention.

Design—We conducted qualitative research, using in-depth interviews.

Setting—Participants were from three rural and three urban primary healthcare clinics, randomly selected in eThekweni District, KwaZulu-Natal.

Participants—25 healthcare providers (including nurse managers, nurses and counselors) were purposively selected from the clinics.

Methods—In-depth interviews were recorded, transcribed and translated. Independent researchers reviewed the transcripts and developed a codebook based on emergent themes, using thematic analysis. NVivo 8 was used to facilitate data management, coding and analysis.

Results—Although most providers had heard that medical male circumcision can reduce risk of HIV acquisition in men, most did not have accurate scientific understandings of this. Some

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providers had misperceptions about the limited/partial protection medical male circumcision offers. Many had concerns that their communities would misunderstand it, causing increased risky sexual behavior.

Conclusions—These data provide a baseline of providers' understandings of medical male circumcision prior to roll-out, and can be used to compare current data and ensure accurate messaging to clients. Healthcare provider messaging should build client understandings of the meaning of partially efficacious technologies.

Keywords

Acceptability; Healthcare providers; HIV prevention; Medical male circumcision; Partial efficacy; South Africa

1. Introduction

Medical male circumcision has been found to reduce the risk of HIV acquisition in heterosexual men by approximately 48–61% (Auvert et al., 2005; Bailey et al., 2007; Gray et al., 2007). The lower HIV risk associated with medical male circumcision has led to concerns that circumcised men may incorrectly believe that they are completely protected, and therefore may increase risky sexual behavior following medical male circumcision. This risk compensation may offset the protective effect of circumcision (Albert et al., 2011; De Bruyn et al., 2010; Herman-Roloff et al., 2011; Milford et al., 2012). However, this is an understudied field, especially outside of the artificial context of large clinical trials in which participants receive intensive, repeated HIV prevention messages.

The WHO/UNAIDS recommends that medical male circumcision be promoted as part of a comprehensive HIV prevention strategy in countries with generalized heterosexual epidemics and low male circumcision rates (De Bruyn et al., 2010). In South Africa, HIV levels continue to be extremely high, with approximately 5.51 million people living with HIV in 2014 (Statistics South Africa, 2014) and male circumcision rates are low (in 2009 approximately 42% of men aged 16–55 reported circumcision (traditional or medical)) (Johnson et al., 2010). Therefore, medical male circumcision scale-up is a priority. The national medical male circumcision program, launched in South Africa in April 2010 (Day et al., 2011), aimed to circumcise 80% of men 15–49 years (approximately 4.3 million men) by 2015, in an attempt to decrease HIV risk in this high prevalence setting. By the end of March 2015, almost five years into the roll-out, approximately 1,900,000 medical male circumcisions had been performed nationally as part of the National Department of Health (DoH) medical male circumcision roll-out (Jacqueline Pienaar, CDC-SA, Personal Communication, 11 May 2015), almost 2.5 million fewer than targeted. In KwaZulu-Natal, 134,146 men were circumcised in the year 2013–2014 as part of this program, 38% of the targeted circumcisions for the province during this period, and 30,229 circumcisions were performed in the eThekweni District over this same period, only 22% of the targeted circumcisions for the District during this period (Ndlovu, 2014).

Acceptability and understanding of medical male circumcision may be a determinant of willingness to circumcise. Cultural acceptability is perceived to be a barrier to medical male

circumcision in South Africa. Traditional male circumcision, a rite of passage to adulthood, is common in South Africa among Xhosa and Sotho-speaking groups in the Eastern Cape, Limpopo and Free State provinces (Greely et al., 2012; Peltzer and Kanta, 2009), and although generally acceptable, it is rarely performed by Zulu-speaking groups in KwaZulu-Natal.

In order for the scale-up of medical male circumcision in South Africa to be a success – both in terms of numbers and appropriate messaging to those being circumcised to ensure accurate understanding of the limited protection medical male circumcision provides, – it is important to understand healthcare providers' views and understandings of medical male circumcision and its partial efficacy. Providers are the critical interface between healthcare provision and the general population, and they need to be in a position to provide accurate, understandable and culturally-appropriate messaging to men considering medical male circumcision services and their female partners, often within the context of prevalent traditional male circumcision practices. Few studies have been conducted on provider understandings of and attitudes about medical male circumcision in South Africa (Mavhu et al., 2014). In this study, which was conducted a few months prior to the roll-out of medical male circumcision in KwaZulu-Natal, we explored healthcare providers' medical male circumcision experience and practices, their knowledge of medical male circumcision and their understandings of its partial efficacy in HIV prevention, and their perceived attitudes toward medical male circumcision for HIV prevention. By exploring providers' knowledge, attitudes and experiences immediately before mass roll-out of medical male circumcision, we may better contextualize the evolution of the program to help us understand reasons behind its successes and challenges.

2. Methods

Three rural and three urban primary healthcare clinics were selected randomly from a comprehensive list of clinics in eThekweni District, KwaZulu-Natal. In-depth interviews were conducted with 25 healthcare providers from these clinics. Staff were selected via quota sampling from different categories, including facility managers, nurses and counselors, in order to elicit a wide range of views and to explore any possible differences in knowledge, attitudes and practices across categories. Written consent was obtained, and all interviews were audio-recorded.

Interviews were conducted at the end of 2009, in English or *isiZulu*, about three months before the roll-out of medical male circumcision in KwaZulu-Natal in April 2010. A semi-structured interview explored a number of themes to elicit information which would inform our key research aims. Topics such as HIV prevention and treatment beliefs, awareness, professional and personal experiences and understanding of circumcision, sociocultural and gender constructions of circumcision, attitudes about proposed medical male circumcision scale-up, integration and policies, and the role of healthcare providers and traditional health practitioners with regard to male circumcision, were explored.

The study was reviewed and approved by the Institutional Review Board of the New York State Psychiatric Institute-Columbia University Department of Psychiatry, the University of

the Witwatersrand's Human Research Ethics Committee, and the University of KwaZulu-Natal's Biomedical Research Ethics Committee. Permission to conduct the study was obtained from the KwaZulu-Natal Department of Health and participating facilities.

2.1. Analysis

Interviews were audio-recorded, transcribed verbatim and translated to English where necessary. A thematic data analysis was conducted, and NVivo 8 (QSR International), a qualitative data management package, was used to organize coding. A code list was developed by two independent researchers, who each read a subset of transcripts to inform and generate broad thematic codes. The code list was modified and refined as more transcripts were reviewed, and results were organized according to emergent key themes. All interviews were double-coded to ensure reliability of the coding. In this analysis, we focused on healthcare provider's practical experiences with medical male circumcision, their knowledge of medical male circumcision and its role in HIV prevention, and their understandings of partial protection of medical male circumcision against HIV for the circumcised male. Healthcare providers' attitudes were explored, focusing on the concerns they have about the potential impact that partial efficacy could have on sexual risk behaviors as well as perceived community acceptability of medical male circumcision.

3. Results

The socio-demographic characteristics of the 25 healthcare providers are presented in Table 1. They comprised facility managers, nurses, HIV counselors and an administrative clerk. Facility managers were primarily professional nurses with a managerial function at the clinic. The majority were female, black African, with a mean age of 44 years. Since we did not identify any differences in knowledge, attitude or practices of medical male circumcision by provider type, we present the aggregated results for the total sample.

3.1. Practices: experiences with medical male circumcision

Since this research was conducted prior to the roll-out, the practice of medical male circumcision specifically for HIV prevention was not explored. Few ($n = 6$) providers had ever assisted with medical male circumcision procedures. Of those who had assisted, half ($n = 3$) demonstrated a clear understanding of how medical male circumcision is conducted (using the forceps method). Only two who had not assisted with medical male circumcision procedures had some idea of how it was conducted.

Almost all providers ($n = 22$) felt that medical male circumcision was safer than traditional male circumcision since it is conducted in a sterile environment.

I think it is safely done in hospitals by surgeons. I don't know about these that are done in the mountains. Stories of sepsis and all those things ... [Manager]

The clinical [male circumcision] that is done at the hospital is better because you are sure that the things that are used there are clean. The technique that they are using is much more clean, rather than the technique that is used in the mountain.

How are they [the traditional healers] doing it? How is the cleanliness of the things they are using [in the mountains]? [Nurse]

3.2. Knowledge of medical male circumcision for HIV prevention

3.2.1. Knowledge that medical male circumcision can reduce the risk of HIV infection—The majority of providers ($n = 22$) knew that medical male circumcision can reduce the risk of HIV infection.

What I have heard is that it [...] doesn't stop HIV, but it does reduce the chances. [Nurse]

Of those who had heard about the efficacy of medical male circumcision against HIV infection, three expressed doubt or disbelief.

Some say if you are circumcised you [have] less chances of contracting HIV, because the foreskin will not cover the secretion from your partner. It's what they say. [...] it's just hearsay. [Manager]

3.3. Knowledge of the partial efficacy of medical male circumcision for HIV prevention

Only one provider had received any formal education about the efficacy of medical male circumcision in reducing risk of HIV infection, but some had learned via television, radio or newspaper ($n = 4$), and others via friends or colleagues ($n = 5$). Many ($n = 10$) who believed in the efficacy of medical male circumcision drew on their prior knowledge and experiences with treating sexually transmitted infections (STIs) to aid their explanations about why circumcision could help reduce the rate of HIV infection in men. Some ($n = 5$) felt the efficacy of medical male circumcision was linked to its capacity to improve penile hygiene and that the removal of the foreskin would ensure that the virus does not have prolonged contact with the penis.

If man is not circumcised they are prone to HIV because the foreskin is being covered, so the HIV it stays there for a long time. [...] But if you are circumcised so, it's just easy to clean after sex. [Manager]

Eight providers believed that medical male circumcision would not be protective for women.

It will make no difference because it doesn't protect women.... [Nurse]

Two providers felt that medical male circumcision would be beneficial to women, in that their partners would be at less risk, akin to the concept of herd immunity protection, or the population's reduction in risk of infection.

If we say that it will [...] decrease the rate of infection to men, in a certain extent it will also help the women. [Manager]

Of the 21 providers who offered an answer, five incorrectly believed that medical male circumcision would have a direct protective effect for women, and three were unsure. One participant expressed skepticism that medical male circumcision would offer protection for either men or women.

Regardless of their beliefs in the efficacy of medical male circumcision, most providers ($n = 21$) felt that clients

Need to be told that even if you are circumcised, you need to use a condom.
[Nurse]

3.3.1. (Mis)understandings of partial efficacy—Over a third of providers ($n = 7$) did not have clear understandings of what partial efficacy means. Two providers interpreted partial efficacy as meaning that men would not get infected with HIV via sexual intercourse, but that they could still become infected through exposure to blood or other modes of transmission.

It means even though he is circumcised, he can still get infected. It's not only sexual, it can be other means. [Manager]

Two providers felt that even reduced risk is still risk and that condoms still need to be used, questioning the added benefit of partially efficacious medical male circumcision.

But I don't really believe that there are small chances [of being infected with HIV]. I think it is a risk even if one has done circumcision but if he didn't protect himself, it's just the same. [Nurse]

Nine providers felt that their community would not easily understand the concept of partial efficacy.

[O]ur community will not understand partial. If I say partial, what does it mean? They would say it means if they sleep with one person, they won't get HIV or if they make sex slowly, they won't get HIV.... They don't know. So, they would say limitation of rounds [of sex] will prevent them from getting HIV because I will be doing it partially. [Nurse]

However, some providers ($n = 7$) felt that the community understanding of "partial efficacy" could be improved through ongoing education, counseling and community engagement.

[W]e have to have talks. Lectures. Take groups in places, in rural areas call the kings and chief and explain about the thing. [Nurse]

3.4. Attitudes toward medical male circumcision

3.4.1. Concern about behavioral disinhibition—Almost all providers ($n = 21$) expressed concern that individuals' sexual risk behavior would increase as a result of medical male circumcision, with increased number of partners and decreased condom use.

To me it's as if he is getting a certificate to just do as he please[s]. [Manager]

Four providers felt that changes in risky sexual behavior would depend on the individual, with some increasing and others decreasing risky behavior. One provider felt that if appropriate information was provided to clients, then condom use would increase. Two providers felt that women would engage in more risky behavior with circumcised men, as they would believe that they are protected and that all

Circumcised men are HIV-negative. [Nurse]

Some providers ($n = 5$) felt that intense and continuous health education and counseling would be necessary to reduce risky sex behavior among circumcised men.

3.4.2. Acceptability of medical male circumcision—Several providers ($n = 6$) felt that the roll-out of medical male circumcision as an HIV prevention intervention would be acceptable to their clients, family, friends, and the community in general. Other providers ($n = 10$) felt that it would be acceptable only to some.

[W]e are serving a diverse community, so some are for circumcision and some [...] have concerns and some are negative about it. [Manager]

There were various reasons for differences in levels of acceptability. Some providers ($n = 3$) felt community members may say

‘what is the use if I have to wear a condom?’ [Whereas] some will I think will say ‘I will have the circumcision still.’ [Manager]

Two providers felt that younger people may find medical male circumcision more acceptable than older people; and one provider each felt that some people may be afraid of undergoing the procedure, that urban-based populations may find it more acceptable than rural-based populations, and that some communities may only accept medical male circumcision for HIV prevention when they have adequate information or understanding of the procedure and its benefits.

Providers had various opinions regarding the cultural acceptability of medical male circumcision for HIV prevention. Two felt that traditional circumcision would be more acceptable than medical male circumcision, and four felt more specifically that Xhosa-speaking people would still feel they need to undergo traditional circumcision in order to be considered a man.

If you are circumcised in the hospital....you are not a man. [Counselor]

Overall, many ($n = 9$) believed that medical male circumcision would be culturally acceptable, one noting that

we don’t have culture anymore, people are westernized [Nurse]

Two providers who felt that medical male circumcision would be culturally acceptable, emphasized that the decision to be medically circumcised is an individual, not a cultural choice. Looking specifically at discussions about whether Zulu-speaking people would accept medical male circumcision for HIV prevention, providers had divided opinions – some ($n = 3$) felt it would be acceptable, while others ($n = 3$) did not.

4. Discussion

Few providers had experience with actual medical male circumcision procedures at the time of our interviews, which took place a few months prior to the national medical male circumcision roll-out. At that time, only doctors were allowed to carry out circumcision (Mavhu et al., 2014; Scott et al., 2005). Currently, there are only draft national guidelines for medical male circumcision, and scope of work still allows only doctors and clinical

associates¹ to perform medical male circumcision. While recommendations have been made that nurses be trained in the procedure (Mavhu et al., 2014; Scott et al., 2005), approval would be required by the South African Nursing Council and Department of Health (Catherine Searle, Personal Communication, 8 August 2013).

Although most healthcare providers knew that medical male circumcision could reduce HIV transmission to the circumcised man, their understandings of this were poor, most likely due to the fact that only one had received formal education about medical male circumcision for HIV prevention. Healthcare provider training for the roll-out was conducted in 2010, and included training on risk compensation, female-to-male risk-reduction and the need for abstinence in the six-week healing period (Claire Mooideen, MatCH Health Systems Strengthening, Personal Communication, 16 September 2013). However, it seems unlikely that all healthcare providers could be adequately trained about medical male circumcision in the three months between our study and the national medical male circumcision roll-out. This suggests that healthcare providers, such as those in our study, may have been inadequately prepared for medical male circumcision rollout. Many may have been unaware of or had disbelief in the efficacy of medical male circumcision to prevent HIV infection, had misunderstanding of the concept of partial efficacy and some may have felt that partial efficacy of medical male circumcision is insufficient and not worth promoting. Some providers, such as the ones we interviewed, may have been concerned that the community would misunderstand partial efficacy and increase sexual risk following medical male circumcision. If healthcare professionals are not convinced that medical male circumcision is an effective and valuable tool in the fight against HIV, they cannot be expected to educate their clients and promote the procedure. The uptake of medical male circumcision in South Africa has fallen short of its goal. By not adequately addressing the concerns outlined above, lack of preparation of healthcare providers prior to medical male circumcision roll-out may be one explanation for this shortcoming.

Currently, at medical male circumcision sites in the eThekweni District, enrolled nurses² counsel groups of men about the procedure prior to and after medical male circumcision. It is critical that enrolled nurses have sufficient knowledge and understanding of the medical male circumcision procedure, and its risks and partial efficacy for HIV prevention in order to counsel men appropriately. Doctors perform the medical male circumcision procedure, and professional nurses complete the dressing of the wounds and are available for any complications following the procedure. Therefore, professional nurses should also be equipped with adequate knowledge for clients. Nurses treating STIs and HIV counselors (who may or may not be operating in sites or facilities offering male circumcision) are in a position to recommend medical male circumcision in line with national priorities, and therefore also need to have adequate understanding to provide accurate messaging to clients.

¹Clinical associates are a relatively new cadre of health workers in South Africa and are similar to physician assistants in the USA. They are able to assess patients, make diagnoses, prescribe appropriate treatments, and undertake minor surgical procedures under the supervision of medical officers.

²Enrolled nurses are a lower category of nurses who assist registered nurses with their duties. They may not penetrate the skin or body of a patient without direct supervision of a registered nurse. They generally give medications and help with doctors rounds.

There is concern that women do not directly benefit from medical male circumcision (Baeten et al., 2009; Mantell et al., 2013). In this study, some healthcare providers erroneously believed that medical male circumcision would be protective for women, and some had concerns that women clients may engage in more risky behavior. A study among Xhosa-speaking people in South Africa also found risk compensation behavior in female partners of circumcised men (Maughan-Brown and Venkataramani, 2012). This highlights a need for training healthcare providers and educating male and female clients and community members in order to prevent false messages of safety. However, as reported elsewhere (Milford et al., 2012), in this study some providers did understand that women may indeed benefit via a “herd immunity effect”, which has been demonstrated in modeling studies (Hallett et al., 2011) and recent research (Jean et al., 2014).

As medical male circumcision provides only partial protection for men, and lower prevention efficacy than consistent condom use (Auvert et al., 2005; Bailey et al., 2007; Gray et al., 2007; Holmes et al., 2004), it should be used in combination with other prevention methods. Lack of understanding about partial efficacy could impact on risky sexual behavior, putting people at increased risk for HIV infection. Previous research shows varied levels of concern about behavioral disinhibition (Albert et al., 2011; De Bruyn et al., 2010; Herman-Roloff et al., 2011; Milford et al., 2012), but less evidence of its occurrence (Ayiga and Letamo, 2011; Mattson et al., 2008; Maughan-Brown and Venkataramani, 2012). Despite the limited evidence of overall increased risk behavior in clinical trial situations, and limited studies of this behavior outside of these conditions, behavioral disinhibition in even a small number of individuals might put these individuals and their partners at increased risk of HIV infection. Medical male circumcision messages about partial protection need to be culturally tailored and should accompany medical male circumcision introduction (Albert et al., 2011).

There has been much discussion around the cultural acceptability of medical male circumcision compared to traditional male circumcision. It has been reported that traditional initiates who have undergone medical male circumcision have mixed attitudes to combining the approaches – with up to 90% having negative views on this (Peltzer and Kanta, 2009). To facilitate acceptability, we need to engage with and understand cultural and religious practices, and work with traditional healers/surgeons to provide safe circumcision and to educate them (Greely et al., 2012; Milford et al., 2012; Sawires et al., 2007). However, similar to other research, our data suggest that decisions about medical male circumcision may be a matter of individual preference, rather than one of cultural identity (Scott et al., 2005). It is important to note that cultural identity is transitional and therefore may change over time. There is still a need to consider cultural practices in medical male circumcision promotion messages, as addressing cultural concerns may increase demand. One study recommends separating messages of medical male circumcision for HIV prevention from cultural or traditional circumcision practices, to encourage men to access medical male circumcision services (Macintyre et al., 2014).

There is an imperative to ensure that healthcare providers are continually trained on, and informed about the efficacy of medical male circumcision, in order to build on their existing knowledge, and to address potential misunderstandings. This will ensure that they are

empowered and able to provide accurate messages to clients, and to provide them with ongoing and intensive health education in this regard. A key factor in the implementation of medical male circumcision programs is having sufficiently trained personnel to implement them (Sawires et al., 2007). Providers' current training needs to be evaluated to ensure this is addressed. Current medical male circumcision programs are falling short of their targets, and this could be attributed to human resource constraints (Perry et al., 2014), but also in part to their lack of understanding about medical male circumcision as an HIV prevention method; however, this would need to be explored empirically.

Development of culturally-appropriate medical male circumcision education materials with messages about partial protection provided by medical male circumcision would be helpful for both healthcare providers and clients. Medical male circumcision messages from healthcare providers need to debunk myths and misconceptions (Hatzold et al., 2014). Women clients also need to be targeted with these materials and messages to give them the tools to help their male partners decide whether or not to be circumcised and this potentially might improve uptake (Jean et al., 2014). These messages are necessary to increase circumcision practices and contribute to a decrease in risky sex behavior, and ultimately, HIV acquisition among circumcised men and their partners. Furthermore, these messages may be adapted for oral pre-exposure prophylaxis (PrEP) as well as prevention technologies being tested that are likely to have partial efficacy, such as vaginal and rectal microbicides and vaccines when they are introduced in the future.

South African national guidelines on medical male circumcision have been drafted and need to be finalized and implemented. It is important that there is not a top-down approach to the implementation of these guidelines, as they are more likely to succeed if providers are involved from the beginning (Mavhu et al., 2014). There also needs to be continuous training and refresher training to ensure that healthcare providers follow the nationally recommended policies (Mavhu et al., 2014). Finally, further research is needed post-medical male circumcision roll-out to ascertain how knowledge and understanding have changed since roll-out began.

5. Study considerations and limitations

Typical of qualitative research, the sample size for this study was small, and findings cannot be generalized beyond this region. However, the data were rich and provided information which is useful to consider and inform recommendations for healthcare providers operating under similar conditions in the Southern African context. These interviews were conducted just a few months prior to the roll-out of the medical male circumcision program in South Africa. Although healthcare provider training was conducted soon after our study, one might question whether healthcare providers can be adequately trained in such a short period of time given their levels of knowledge, understanding, acceptability and beliefs regarding medical male circumcision, as demonstrated in this study. Importantly, this study provides a baseline on which to compare current levels of knowledge, and additional research is needed to determine whether healthcare providers currently are adequately prepared for the current ambitious medical male circumcision program. To ensure the ongoing success of the medical male circumcision program, the evolution of healthcare providers' views about

medical male circumcision as an HIV prevention method needs to be documented and evaluated over time so that gaps can be addressed.

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References

- Albert LM, Akol A, L’Engle K, Tolley EE, Ramirez CB, Opio A, Tumwesigye NM, Thomsen S, Neema S, Baine SO. Acceptability of male circumcision for prevention of HIV infection among men and women in Uganda. *AIDS Care*. 2011; 23(12):1578–1585. [PubMed: 21732902]
- Auvert B, Taljaard D, Lagarde E, Sobngwi-Tambekou J, Sitta R, Puren A. Randomised, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 trial. *PLoS Med*. 2005; 2(11):e298. [PubMed: 16231970]
- Ayiga N, Letamo G. Impact of male circumcision on HIV risk compensation through the impediment of condom use in Botswana. *Afr. Health Sci*. 2011; 11(4):550–559. [PubMed: 22649434]
- Baeten JM, Celum C, Coates TJ. Male circumcision and HIV risks and benefits for women. *Lancet*. 2009; 374(9685):182–183. [PubMed: 19616704]
- Bailey RC, Moses S, Parker CB, Agot K, Maclean I, Krieger JN, Williams CFM, Campbell RT, Ndinya-Achola J. Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomised controlled trial. *Lancet*. 2007; 369(9562):643–656. [PubMed: 17321310]
- Day, C.; Gray, A.; Budgell, E. Health and related indicators. In: Padarath, A.; English, R., editors. *South African Health Review 2011*. Durban: Health Systems Trust; 2011.
- De Bruyn G, Martinson NA, Gray G. Male circumcision for HIV prevention: Developments from sub-Saharan Africa. *Expert Rev. Anti-infective Ther*. 2010; 8(1):23–31.
- Gray RH, Kigozi G, Serwadda D, Makumbi F, Watya S, Nalugoda F, Kiwanuka N, Moulton LH, Chaudhary MA, Chen MZ, Sewankambo NK, Wabwire-Mangen F, Bacon MC, Williams CFM, Opendi P, Reynolds SJ, Laeyendecker O, Quinn TC, Wawer MJ. Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial. *Lancet*. 2007; 369(9562):657–666. [PubMed: 17321311]
- Greely P, Maharaj P, Letsoalo T, Miti A. Traditional male circumcision for reducing the risk of HIV infection: perspectives of young people in South Africa. *Cult. Health Sex*. 2012; 15(2):148–159. [PubMed: 23140158]
- Hallett TB, Alsallaq RA, Baeten JM, Weiss HA, Celum C, Gray R, Abu-Raddad L. Will circumcision provide even more protection from HIV to women and men? New estimates of the population impact of circumcision interventions. *Sex. Transm. Infect*. 2011; 87:88–93. [PubMed: 20966458]
- Hatzold K, Mavhu W, Jasi P, Chatora K, Cowan FM, Taruberekera N, Mugurungi O, Ahanda K, Njeuhmeli E. Barriers and motivators to voluntary medical male circumcision uptake among different age groups of men in Zimbabwe: results from a mixed methods study. *PLoS ONE*. 2014; 9(5):e85051. [PubMed: 24802746]
- Herman-Roloff A, Otieno N, Agot K, Ndinya-Achola J, Bailey RC. Acceptability of medical male circumcision among uncircumcised men in Kenya one year after the launch of the national male circumcision program. *PLoS ONE*. 2011; 6(5):e19814. [PubMed: 21603622]
- Holmes KK, Levine R, Weaver M. Effectiveness of condoms in preventing sexually transmitted infections. *Bull. World Health Organ*. 2004; 82(6):454–461. [PubMed: 15356939]

- Jean, K.; Lissouba, P.; Taljaard, D.; Taljaard, R.; Singh, B.; Bouscaillou, J.; Peytavin, G.; Sitta, R.; Mahiane, SG.; Lewis, D.; Puren, A.; Auvert, B. HIV incidence among women is associated with their partners' circumcision status in the township of Orange Farm (South Africa) where the male circumcision roll-out is ongoing; 20th International AIDS Conference (AIDS 2014); Melbourne, Australia. 2014.
- Johnson, S.; Kincaid, L.; Laurence, S.; Chikwava, F.; Delate, R.; Mahlasela, L. Second National HIV Communication Survey, 2009. Pretoria: JHHESA; 2010.
- Macintyre K, Andrinopoulos K, Moses N, Bornstein M, Ochieng A, Peacock E, Bertrand J. Attitudes, perceptions and potential uptake of male circumcision among older men in Turkana County, Kenya using qualitative methods. PLOS ONE. 2014; 9(5):e83998. [PubMed: 24802112]
- Mantell JE, Smit J, Saffitz JL, Milford C, Mosery N, Mabude Z, Tesfay N, Sibiyi S, Rambally L, Masvawure TB, Kelvin E, Stein ZA. Medical male circumcision and HIV risk: perceptions of women in a higher learning institution in KwaZulu-Natal, South Africa. Sexual Health. 2013; 10(2):112–118. [PubMed: 23448912]
- Mattson CL, Campbell RT, Bailey RC, Agot K, Ndinya-Achola J, Moses S. Risk compensation is not associated with male circumcision in Kisumu, Kenya: a multi-faceted assessment of men enrolled in a randomised controlled trial. PLoS ONE. 2008; 18(3):e2443. [PubMed: 18560581]
- Maughan-Brown B, Venkataramani AS. Learning that circumcision is protective against HIV: Risk compensation among men and women in Cape Town, South Africa. PLoS ONE. 2012; 7(7):e40753. [PubMed: 22829883]
- Mavhu W, Frade S, Yongho A, Farrell M, Hatzold K, Machaku M, Onyango M, Mugurungi O, Fimbo B, Cherutich P, Rech D, Castor D, Njeuhmeli E, Bertrand JT. Provider attitudes toward the voluntary medical male circumcision scale-up in Kenya, South Africa, Tanzania and Zimbabwe. PLOS ONE. 2014; 9(5):e82911. [PubMed: 24801632]
- Milford C, Smit J, Beksinska M, Ramkissoon A. There's evidence that this really works and anything that works is good: views on the introduction of medical male circumcision for HIV prevention in South Africa. AIDS Care. 2012; 24(4):496–501. [PubMed: 22112011]
- Ndlovu, NI. Status of eThekweni HIV and AIDS, TB and STI multisectoral response FY 2013/2014; eThekwini DAC meeting; 18 June; Durban. 2014.
- Peltzer K, Kanta X. Medical circumcision and manhood initiation rituals in the Eastern Cape, South Africa: a post intervention evaluation. Cult. Health Sex. 2009; 11(1):83–97. [PubMed: 19234952]
- Perry L, Rech D, Mavhu W, Frade S, Machaku M, Onyango M, Omondi Aduda DS, Fimbo B, Cherutich P, Castor D, Njeuhmeli E, Bertrand J. Work experience, job-fulfillment and burnout among VMMC providers in Kenya, South Africa, Tanzania and Zimbabwe. PLoS ONE. 2014; 9(5):e84215. [PubMed: 24802260]
- Sawires SR, Dworkin SL, Fiamma A, Peacock D, Szekeres G, Coates TJ. Male circumcision and HIV/AIDS: challenges and opportunities. Lancet. 2007; 369(9562):708–713. [PubMed: 17321321]
- Scott BE, Weiss HA, Viljoen JI. The acceptability of male circumcision as an HIV intervention among a rural Zulu population, KwaZulu-Natal, South Africa. AIDS Care. 2005; 17(3):304–313. [PubMed: 15832878]
- Statistics South Africa. Mid-year Population Estimates. Pretoria: Statistics South Africa; 2014.

What is already known about the topic?

- Medical male circumcision (MMC) has been found to reduce the risk of HIV acquisition in heterosexual circumcised men by approximately 48–61%.
- In South Africa, HIV levels continue to be extremely high, with approximately 5.51 million people living with HIV in 2014.
- Male circumcision rates in South Africa were low (in 2009, approximately 42% of men aged 16–55 reported circumcision (traditional or medical)).
- The WHO/UNAIDS recommended that MMC be promoted as part of an HIV prevention strategy in countries with high heterosexual HIV epidemics and low circumcision rates.
- MMC has been scaled up in South Africa, with the roll-out of a national MMC program, which started in 2010.
- MMC scale-up has been slow nationally in South Africa, with almost 2.5 million fewer circumcisions being performed than were targeted (by July 2014).

What this paper adds

- Most healthcare providers knew about medical male circumcision as an HIV prevention strategy.
- Some healthcare providers misunderstood the concept of partial efficacy, and did not understand how medical male circumcision could reduce the likelihood of HIV infection in circumcised men.
- Some healthcare providers had concerns that potential clients (men and women) would not understand partial efficacy, and that they would therefore engage in higher risk sex behavior (such as unprotected sex) if the male partner was circumcised.
- There is a need to provide information to and facilitate the ongoing training of healthcare providers, including traditional healers, to improve medical male circumcision messages and services provided in South Africa.
- There is a need to provide information to support accurate, culturally appropriate messaging and education materials for men considering MMC services and for their female partners.

Table 1

Socio-demographic characteristics of healthcare providers.

Participant characteristics	Descriptive statistics
<i>Staff category, n (%)</i>	
Facility manager	6 (24%)
Nurse	12 (48%)
HIV counselor	6 (24%)
Administrative clerk	1 (4%)
<i>Sex, n (%)</i>	
Male	2 (8%)
Female	23 (92%)
<i>Race, n (%)</i>	
Colored	1 (4%)
Black African	24 (96%)
<i>Age (years)</i>	
Median (Range)	43 (26–67)
Mean (SD)	44 (11.1)