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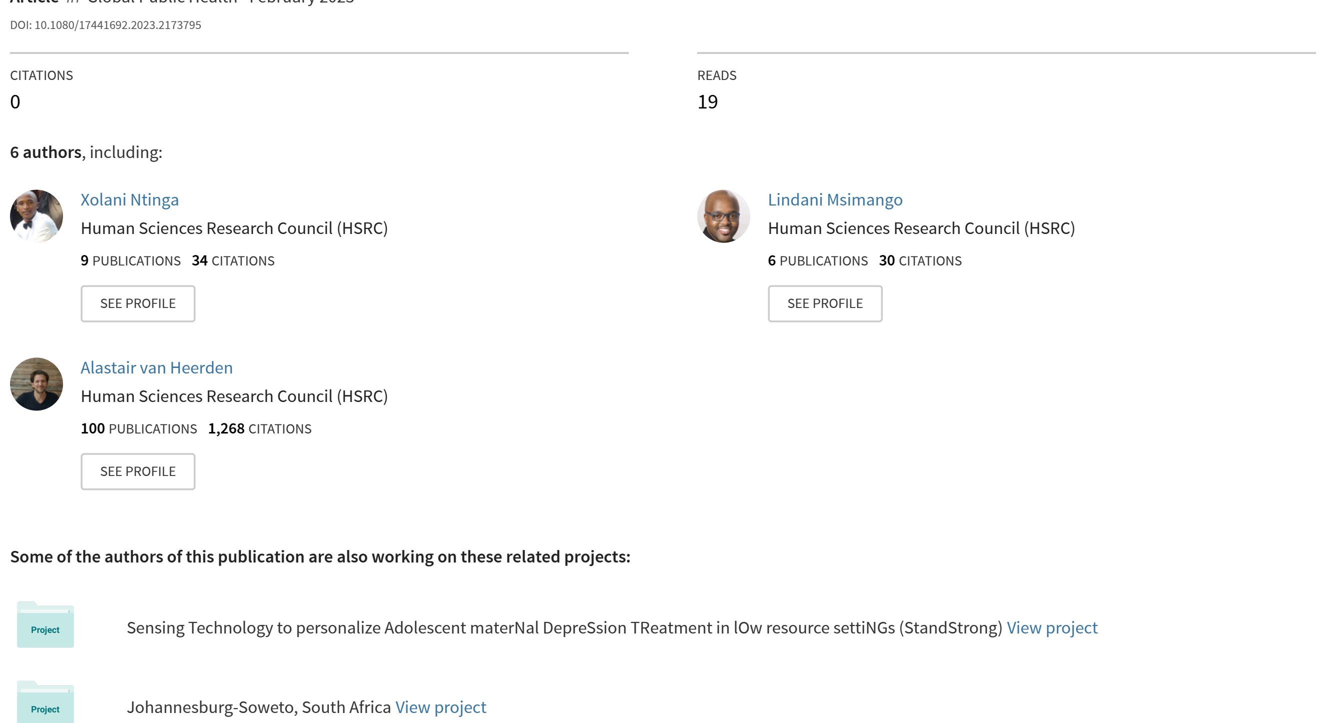

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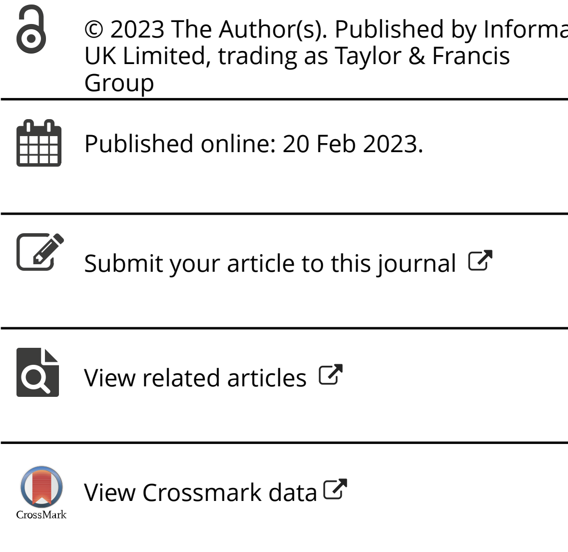

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RESEARCH ARTICLE

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Opportunities to leverage reproductive goals and ideals among South African men to promote HIV testing, treatment and prevention: A qualitative study

Oluwaseyi O. Isehunwa [a], Xolani Ntinga[b], Lindani Msimango[b], Patricia M. Smith[a], Alastair van Heerden[b,c] and Lynn T. Matthews [a]

[a]Division of Infectious Diseases, Department of Medicine, University of Alabama at Birmingham, Birmingham, AL, USA; [b]Centre for Community Based Research, Human Sciences Research Council, Pietermaritzburg, South Africa; [c]MRC/WITS Developmental Pathways for Health Research Unit, Department of Paediatrics, Faculty of Health Science, University of the Witwatersrand, Johannesburg, South Africa

ABSTRACT

Despite significant gains in HIV testing, treatment and prevention in sub-Saharan Africa, male engagement and retention in HIV care remains a challenge. We conducted in-depth interviews with 25 men with HIV (MWH) living in rural South Africa to explore how men's reproductive goals could inform approaches to engage men and their female partners in HIV care and prevention. Themes were organised into opportunities and barriers for HIV care, treatment and prevention that men articulated as important to their reproductive goals at the individual, couple and community levels. At the individual level, men are motivated to remain healthy so they can raise a healthy child. At the couple level, the importance of maintaining a healthy partner to raise children may promote serostatus-disclosure, testing and encourage men to support partners to access HIV prevention. At the community level, men described the need to be seen as fathers who provide for their families as important motivators to engage in care. Men also articulated barriers including low knowledge about antiretroviral-based HIV prevention, lack of trust within partnerships and community stigma. Addressing reproductive goals of MWH may be an untapped path for promoting male engagement in HIV care and prevention for their partners.

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Men with HIV (MWH); reproductive goals; HIV treatment and care; safer conception; male engagement

Introduction

South Africa has the highest burden of HIV in the world with an estimated 8.2 million people living with HIV (SSA, 2021). Although there have been significant gains in HIV testing, treatment and prevention across gender and age groups in South Africa, data suggest that men with HIV (MWH) continue to fare poorly compared to women (Lurie et al., 2020). A 2021 report from the Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that in South Africa, 91% of MWH knew their serostatus, 64% were accessing treatment, and 58% were virally suppressed. This is compared to 94%, 78% and 72% respectively for women with HIV (UNAIDS, 2021). Indeed,

CONTACT Oluwaseyi Isehunwa oluwaseyiisehunwa@uabmc.edu Division of Infectious Diseases, Department of Medicine, University of Alabama at Birmingham, 703 19th Street South, Birmingham, AL 35233, USA

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in 2020, mortality from AIDS-related causes was higher among men compared to women in South Africa: 49,000 versus 29,000 respectively (UNAIDS, 2021).

While unmarried relationships are more common in South Africa compared to many other sub-Saharan African countries (Hosegood et al., 2009), a large fraction of the adult population is in married, stable, or cohabiting relationships (Chemaitelly et al., 2012; Leddy et al., 2016). Most incident HIV occurs within stable heterosexual partnerships (Chemaitelly et al., 2014). Studies from sub-Saharan Africa suggest that MWH have reproductive needs or goals and play a key role in their partners' sexual and reproductive health (Iliyasu et al., 2020; Khidir et al., 2018; Lusambili et al., 2021; Montgomery et al., 2011). Given the desire among MWH to have children (Wekesa & Coast, 2014), failures to engage men in their own sexual and reproductive health, may be a missed opportunity to support MWH to engage and remain in HIV care. In addition, women, and therefore their infants, face increased risks of HIV acquisition during pregnancy, delivery and postpartum periods (Pintye et al., 2020). Engaging MWH thus provides opportunities to promote HIV prevention in the context of reproductive goals (i.e. safer conception care) and reduce the risk of HIV acquisition and transmission among women of reproductive age and children.

Our prior series of formative research in South Africa on strategies to prevent transmission of HIV among men and women living with HIV reporting a recent pregnancy with an HIV-negative or unknown serostatus partner identified that nurses and physicians in public health facilities prioritised counselling on condom use and strategies to prevent mother to child transmission (PMTCT), with limited counselling on how to reduce HIV during periconception periods (Matthews et al., 2012; Matthews et al., 2013; Matthews, Milford, et al., 2014; Matthews, Moore, et al., 2015). As a result, many persons living with HIV with recent pregnancy have little understanding of HIV – serodiscordance, fail to disclose their status to their pregnancy partner, and are unaware of HIV risk reduction opportunities during periconception periods (Matthews, Moore, et al., 2014; Matthews, Smit, et al., 2015).

Based on the formative work outlined in the prior paragraph, our team developed and piloted an intervention to promote HIV treatment and prevention in the context of reproductive goals (also called safer conception care) for men in urban South Africa (Khidir et al., 2018; Matthews et al., 2021; Matthews et al., 2022). The pilot three-session intervention '*Sinikithemba Kwabesilisa*' promoting men to disclose their HIV serostatus to their female partner, adhere to antiretroviral therapy (ART), and achieve viral suppression before engaging in condomless sex was acceptable and feasible, and preliminary outcome data were promising. The pilot study was conducted between 2015 and 2017 and 88% of men completed the intervention session, 81% were taking ART at study exit, and 100% of those on ART were virally suppressed at 12 weeks. Most (75%) reported disclosure to pregnancy partners. In exit interviews, men shared the importance of expanding to rural communities and engaging peer support.

In light of the exit interview data from the pilot study, our team identified a need for further insight into the reproductive goals, motivations and behaviours of men with HIV in a rural South African setting and their insights into peer support. We also explored the relevance of leveraging reproductive goals to promote viral load suppression among MWH in a rural community in 2021, further into the Test and Treat era for South Africa, and in the setting of the national PrEP rollout. Our overarching aim was to understand how the reproductive goals and ideals of men in a rural community in 2022 could inform adaptations to our intervention ('Sinikithemba Kwabesilisa'), which in English means *we give hope to men*, to engage men and their partners with reproductive goals into HIV care and prevention.

Methods

Study design and population

We conducted an independent study consisting of in-depth interviews with men with HIV (MWH) living in rural KwaZulu-Natal (KZN), South Africa. KZN is the second largest province in South

Africa by population with an estimated 11. 5 million people (19.1%) (SSA, 2021). Adult HIV prevalence in the region is estimated to be about 37% (Vandormael et al., 2018). This work was conducted in the uMgungundlovu District, Pietermaritzburg the capital city of KZN and over 1 million people reside in traditional farmland, informal rural and urban dwellings (van Heerden et al., 2022). The primary language spoken is isiZulu, the majority identify as Christians, and a large proportion live below the poverty line. In KwaZulu Natal, like in many other African settings, many of the decisions in the home including decisions around reproductive health are determined by men. Additionally, while Zulu men consider children to be important and a blessing, a male child is valued more because of the belief that they will carry on the family name. However, long-term cohabitation is a more common practice than marriage in rural KwaZulu Natal, South Africa (Ndinda et al., 2017).

Eligibility and recruitment

Between April and September 2021, we recruited participants purposively from a research database of participants who provided consent to be contacted for future studies. This research database is maintained by the Human Sciences Research Council (HSRC) and included men who participated in studies focused on HIV treatment and prevention with men and women in the last 5 years. Men who met eligibility criteria – identified as male, aged 18–65 years, HIV-positive, living in uMgungundlovu District, fluent in either English or isiZulu – were contacted by study staff who explained the study and conducted an informed consent process. 29 of the 50 men screened met eligibility criteria. Of these 29 men, 3 could not be reached again and 1 declined a telephonic interview (preferred a face-to-face interview).

Procedures

Enrolled participants completed a brief interviewer-administered demographic questionnaire followed by a telephonic in-depth interview (IDI). Telephonic interviews were conducted to reduce person-to-person contact during the COVID-19 pandemic. All interviews were conducted in isiZulu by one of the co-authors, LM, a Black South African first language isiZulu speaker and a research assistant with qualitative methods training. Prior to the interview, participants were contacted by phone to review the virtual data collection procedures, obtain consent for the telephonic interviews, and provide participants with a unique participant identification number. Participants were informed that the purpose of the study was to hear their thoughts and opinions on what services men living with HIV would like for themselves and their partners, in order to reduce the chances of HIV transmission to partners or babies including the types of HIV prevention programmes they would like to see in their communities and the impact of COVID-19 pandemic on their life, reproductive plans and access to HIV care. Each participant was reimbursed with ZAR150 (~ 12 USD) according to the time, inconvenience and expenses model (Koen et al., 2008), endorsed by South Africa's National Health Research Ethics Committee.

Data collection and analysis

Socio-demographic data, HIV and reproductive history were collected via questionnaire. The IDIs were developed by the research team, informed by prior research (Khidir et al., 2018; Matthews et al., 2021), and explored topics around HIV testing, living with HIV, reproductive goals, and knowledge and experiences with safer conception care, 'Undetectable equals Untransmittable' (U = U) / Treatment as Prevention (TaSP), and PrEP for HIV prevention. We also explored how the COVID-19 pandemic might impact reproductive goals and plans. IDIs followed a semi-structured interview guide with open-ended questions and were conducted in isiZulu lasting between 45

and 105 minutes. All interviews were audio-recorded, transcribed and translated into English. Interviews were analysed using the thematic analysis approach. Transcripts were read by the study team and discussed; recruitment was conducted until transcript review by the study team identified thematic saturation. Themes were identified using a thematic analysis approach, and a codebook was developed. Two research team members (OI and XN) double-coded 10% of the transcripts using the codebook developed to ensure accurate interpretation of the codes. The remaining transcripts were coded separately by OI and XN using NVIVO 12 to organise data and facilitate coding.

Ethics approvals

Ethical approvals for this study were obtained from the Human Sciences Research Council (HSRC) Research Ethics Committee and the Institutional Review Board (IRB) at the University of Alabama at Birmingham, Alabama.

Results

Participants characteristics

A total of 25 men living with HIV enrolled between April and September 2021. The demographic characteristics of participants are presented in Table 1. The median age of men was 44 years. About half had completed secondary school (n = 13, 52%), and close to two-thirds were unemployed (n = 15, 60%). More than half of the men reported an HIV diagnosis of more than 10 years (n = 14, 56%), and all reported taking ART. Most men reported having one primary partner (n = 22, 92%), most reported a primary partner living with HIV (n = 18, 72%) and approximately two-thirds (n = 16, 64%) reported they were in a long-term relationship. More than half of the men reported having no child with their current primary partner (n = 15, 60%) and were certain that their partner wanted to have a child with them (n = 13, 52%).

Opportunities and barriers to leverage reproductive goals of MWH to promote HIV testing, treatment and prevention

The analysis is organised to identify ways in which men's reproductive goals may be leveraged, and therefore how the 'Sinikithemba Kwabesilisa' intervention may be adapted, to promote HIV testing, treatment and prevention. Emergent themes were organised into three levels: individual, couple and community/structural.

1. Individual level
    a. Men may engage in care and take ART in order to have a healthy child and live to raise that child.

Men described the desire to have HIV-uninfected children, desire to remain healthy and alive so they could be a part of their children's lives, and the desire to meet the basic needs of their children. Thus, individual level motivations to have HIV-uninfected children may encourage men to be virally suppressed and engage in care.

> It is important to have a child, but if you are [living with] HIV, you must always try to make sure that the child does not get infected. So, even if you are doing it you must make sure that you do it carefully so that the child will be well (45 yo man, #2).

> I think having a child often makes us happy and motivates us however, when one of you is sick, it does not make you happy. It is very painful (43 yo man, #20).

Table 1. Demographic characteristics of participants ($N = 25$).

Characteristics	Overall *(N=25) N (%) Median (IQR)*	Missing *N*
Age[a]		4
Median (Q1, Q3)	44 (39,48)	
Min, Max	28,58	
Education		
Completed primary school or below	2 (8%)	0
Some secondary school	10 (40%)	
Completed secondary school or higher	13 (52%)	
Employment status		0
Not employed	15 (60%)	
Part-time/Self-employed	10 (40%)	
Race		0
Black South African	24 (96%)	
Black Non-South African	1 (4%)	
Total number of partners past 6 months[b]		1
1	22 (92%)	
2	1 (4%)	
3	1 (4%)	
Duration of HIV diagnosis		0
<2 years	4 (16%)	
2–5 years	3 (12%)	
5–10 years	4 (16%)	
>10 years	14 (56%)	
ART status		
Yes	25 (100%)	0
Number of children fathered		0
0	5 (20%)	
1	4 (16%)	
2	7 (28%)	
3+	9 (36%)	
Relationship status with primary partner		0
Spouse/living as married	5 (20%)	
Long-term partner	16 (64%)	
Partner <1 year	4 (16%)	
Number of children with primary partner		0
0	15 (60%)	
1	3 (12%)	
2	5 (20%)	
3+	2 (8%)	
Condom use with primary partner during last sex		0
Yes	13 (52%)	
No	12 (48%)	
Do you want to have a baby with your primary partner?		0
Definitely yes	12 (48%)	
Probably yes	5 (20%)	
Probably not	4 (16%)	
Definitely not	1 (4%)	
Never discussed	2 (8%)	
Don't know	1 (4%)	
Do you think your main partner wants to have a baby with you?		0
Definitely yes	13 (52%)	
Probably yes	4 (16%)	
Probably not	2 (8%)	
Definitely not	3 (12%)	
Never discussed	3 (12%)	
HIV status of primary partner		0
HIV positive	18 (72%)	
HIV negative	7 (28%)	

[a] Missing N=4; [b] Missing N=1

I have my boys and I love them. And the main thing that I think is more important especially for the children is that even though I am HIV positive, none of them are HIV positive. Some of my friends also have children, but their children are also HIV positive so I'm not sure how, because I don't know if they were following the procedures that were supposed to be followed, I really don't know (42 yo man, #24).

Some of the men recognised the need to be on treatment so they could have HIV uninfected children.

> … You can't just wake one day and tell your partner that you want them to be a mother of your children … You have to first make sure that your viral load is good, they have to take their medication well and as instructed. … .As someone who has been taking their treatment well, I am at a stage where it is possible for me to decide to have children with my partner (43 yo man, #6).

Some men also expressed the need for education to learn how to have HIV-uninfected children.

> … You first need to attend a class that will teach you about steps you need to take to have a healthy child (49 yo man, #7).

> I think it is important to learn. It is human nature to have children and I'm sure anyone would want to have children, so if they adhere to their medication and gain knowledge on the different ways the unborn child will be protected (Missing age, #13)

One participant commented that more knowledge about U = U as an option to have a healthy baby could motivate men to adhere to their treatment.

> I think it (U = U) will help them follow their treatment plans. Because even using condom sometimes does not guarantee that the child comes out healthy, so I think this information can be helpful to people (40 yo man, #19).

b. Desires to avoid HIV clinics, alcohol use and lack of information remain important individual-level barriers to male testing, engagement and retention in care regardless of reproductive goals.

Despite their desire to have healthy children, men articulated the fear some men may have of accessing HIV care.

> Men are reluctant to go to the clinic, even when you tell them about it they say things like, "don't count me on those things, look at my woman she is well", and you end up having to tell them that, "No, man, your woman is looking well because she takes treatment, she collects treatment with us, in fact it is her who told me to warn you!" It is only in that moment they will start worrying; men generally fear going to the clinic (50 yo man, #5).

Most men expressed a lack of knowledge about how to be virally suppressed and low knowledge about prevention strategies needed to support having uninfected children. Almost all men said they were unaware of U = U or PrEP as strategies to reduce HIV transmission and achieve partner pregnancy.

> I think before anything we should first be educated about the viral load and CD4 count. This is where they can explain to us about how much our viral load should be in order for us to have unprotected sex without infecting our partners. I know that there is a viral load and a CD4 count, but I do not have any knowledge as to how they should be, therefore I am unable to do anything. I have never had anyone explain to me that my viral load is this much, then I can have unprotected sex without infecting my partner. That does not mean I should be careless, but I can have sex without a condom (49 yo man, #7).

> I have never heard about this before; I've only heard about the importance of using a condom which I have had to use in my household. However, sometimes it is difficult to use a condom. (Missing age, #13)

> I think it (U = U) would work and it is my first time learning about, that if you are undetectable, you cannot infect another person. (46 yo man, #27)

Some men reported they had heard of interventions to support having a healthy baby but never participated in them.

> I never went for such intervention, however I have heard health professionals at the clinic telling those who want children that such services are available, and that they can consult with them. But as an individual I have never been part of this intervention (46 yo man, #1).

Men also expressed excessive alcohol consumption as a barrier to adherence to treatment and being able to support healthy children.

> Some people are ruled by alcohol, hence alcohol controls them and they end up forgetting that they have to take care of their children, or even forget that they have children (38 yo man, #9).

2. Couple level motivations and barriers

    a. The importance of meeting reproductive goals, having HIV-uninfected children in the family, and maintaining a healthy partner to raise children may promote disclosure, testing and encourage men to support partners to access HIV prevention strategies such as PrEP.

Men in serodifferent relationships described their desire to protect their partner while trying to have a healthy baby. They described the need for information on how to protect their female partner from acquiring HIV while trying to have a child.

> I have a wish to have children. I think that having a child is like recreating another part of who you are. So, I think that everyone has that wish as I do. However, I always think of how I could protect my partner because she is not HIV-positive … … … . We have always said that we want to get more information however, we have not gotten around to doing that, we wanted to go somewhere and gain more knowledge to what we have at the moment … .I know that you can have a child and the child does not get infected if you take medication. However, I am not sure how you would protect your partner (32 yo man, # 21).

> I want to ask, if I manage to marry my current partner and we decide that to have children, since I have told you that she is HIV negative, and I am positive, which steps should I take when I want to have children with her? What must I do? (49 yo man, #11).

Men recognised the importance of HIV serostatus disclosure to their partner to meeting their reproductive goals of having HIV-uninfected children. Couple-level motivations to meet reproductive goals with partners and maintain a healthy partner may encourage men to disclose their HIV serostatus to their partner.

> According to the doctors it is a possible thing to actually have a good and healthy child even if you are HIV-positive. However, my thoughts are it's important to first be honest with your partner … let them know [your sero-] status so that you can then take the necessary precautions regarding having a child. So maybe once you both agree that you want to have a child you can then go to a doctor and get proper guidance on the process of conceiving, making sure that the child is protected from being infected. From my understanding, there is medication that needs to be taken during pregnancy to ensure that the child is healthy [and] HIV negative (38 yo man, #26).

Men expressed willingness to visit the clinic with their partner to receive couples counselling and discuss safer conception strategies.

> I would say, in my case, I have been on ARVs for a long time. So, it would mean meeting up with a counselor with my partner and inform them on the plans to have children. The counselor can than advise. Furthermore, the woman who will carry the baby should also go through a process to establish whether she would be able to carry the baby. The counselor can advise us on the process and whether we would be able to have the baby or not. We would need to have a thorough check on our viral load so that my partner can also plan (43 yo man, #27).

> What I know is that when my partner and I have decided and discussed to have a child and we have to go to a counsellor. He/ she will talk to us, check our files and they see if we are fit to have a child. I also know that we can have unprotected sex if we are planning to have a child. However, this is only done when you want to have children, and you have to do it under the supervision of an expert as you have to be in a good health condition (43 yo man, #6).

One participant highlighted the importance of engaging men through their female partners.

> You know what softens a man? It is mostly women; I think since they like going to the clinic they should beg their partners to come with them, because if you love someone you will follow them around. If there is love, there is a way (50 yo man, #5).

Some men articulated their desire to be offered self-testing kits that they could take home to give their partners, and felt It would encourage disclosure, and testing.

> I do think that one thing that could be helpful would be home testing kits that the clinics offer now when a person finds out they are actually positive they can take the kit home. They take her test kits home and they go and get tested with their partner. I think that would be a better way to help them disclose and get their partners to test as well. I also think it might also aid in the partner accepting their partner's status in a better way … . My understanding is that the important thing is to go to a doctor together get tested, and then go through the whole process of what you need to know before conceiving (42 yo man, #24).

b. Lack of trust within partnerships and fears of disclosure consequences remain barriers to HIV prevention and care within partnerships.

Some men commented that their lack of commitment to their partner was one of the barriers to couples counselling and testing.

> So, if a man knows that he is living with HIV, he will come up with lots of excuses when his partner initiates that they go and get tested for HIV. In some cases, the men don't know their HIV status, but because they know that they are unfaithful, they will have excuses (26 yo man, #25).

> I think that if they do not have a future together. When you know that you do not foresee a future with someone, I also would not test with someone if I know that I am not planning on staying. After I had tested, I informed my partner and she tested the next day, but from that moment we decided to support each other. However, I do not think that it is that easy to test together if the other person knows that you are not there to stay (32 yo man, #15).

One participant pointed out that doubts about their relationship prevented men from disclosing to their partners and could lead to men defaulting on their treatment.

> They hide it from their partners and this may be due to uncertainty and the seriousness of where the relationship is going, so they will hide this, until such a time that the relationship is stable. However, you also find that some men fear disclosing after keeping their HIV status a secret and are often met with the question such as "How do I disclose this after such a long time? Others choose to default their treatment" (42 yo man, #4).

Men commented that the fear of a breakup in the relationship was a barrier to couples testing.

> Some people take the news badly, and break up the relationship, where it is found that one partner has HIV. They do this out of fearing that the other party will infect them, hence end the relationship. This is one of the reasons why some men don't tell their partner when they found out that they are HIV positive (31 yo man, #18).

> I once met a woman in (town about 200 km away) whilst I was working there at these contractors, and she initiated that we should get tested however, I ignored her because she knew that she was HIV negative and she had the forms to prove it and I already knew that I was HIV positive but she wanted us to get tested together. I feared that she may view me in another perspective. I was not willing to disclose to her and I think that could be one of the reasons that people avoid testing (32 yo man, #15).

Men reported that it was difficult to communicate and convey their reproductive needs properly with their partner, which led to disagreement, and the inability to support each other to remain healthy and make informed decisions to meet their reproductive goals.

> I would say that the challenges are often faced by men because when a woman decides that she does not want to have children, that is the final decision. No matter how I feel as a man and no matter how much I may want to have children, that is never important. I would say that this issue is the reason why most men would have children outside of the relationship because of the challenges and pressures within their relationship. When the woman in the relationship realizes that there is a child outside of the relationship it is a problem, and although the man may want to have children, they are denied that (43 yo man, #27).

3. Community and structural level motivations and barriers
    a. Men described the need to be seen and respected as fathers who provide for their families in their communities as important motivators to engage in care.

The following quotes highlight the importance of the fatherhood role in Zulu culture and men articulated that fulfilling this role may motivate HIV care and treatment.

> In my culture, having a child is important to continue the family lineage, that's why I promise to take of my child when God blesses me with one (51 yo man, #23).

> I think in the community, maturity and growth is seen through your ability to have children. I do not think that growth is measured through age. When you raise your children and educate them, this is seen as an achievement (58 yo man, #12).

Also, men described the need for peer support and aligned messages to promote adherence to treatment. Some men also suggested that innovations in non-facility-based care could encourage treatment and engagement in care.

> I think that sometimes it just takes sitting down with people and advising them on HIV and getting tested. Men who are HIV positive need to call on meetings where they can discuss this matter and they also need to be made aware of my age for example and how life is continuing for me. Taking treatment is not different from taking compral pain killers. Some will agree and others will not, so if a few agree to get tested then that would make a difference. It is so easy to even get treatment because there is a car that drops of medication. We would speak with both men and women especially with the risks of COVID-19. You have an option to either take your medication in the morning or at night, I choose to take it at night (32 yo man, #15).

> I think the service provider would have to be an organization that disguises as a recreational organization. Perhaps this could be in a form of games, but with the intention to deliver treatment. The delivery of pills should be indirect to avoid stigmatization (27 yo man, #16).

One participant suggested that for MWH having uninfected healthy children can help destigmatise living with HIV.

> So now that I have all my children, it has become a norm and they even talk about the pills, they know my schedule and they even remind me when it's time to take them. I do not hide them, but I put them on top of the table, and they know. I talk about the HIV so I think it's also very important because one day they will be able to motivate other people and tell them that their own father lived with the virus for such a long time, because he took his pills, should they also be infected. So, it also just teaches them that HIV does not mean that it is the end of the world but then it only just means that you need to be more careful with your life on a day-to-day basis and you need to take medication (42 yo man, #24).

b. Community stigma, fewer opportunities to interact with the health care system, poor access to PrEP and other HIV services remain important community and structural barriers.

Despite these motivations, men describe barriers at the community and structural levels. Most men reported that community stigma around HIV was still prevalent and a barrier to getting tested and engaging in care. Additionally, men commented that stigma around infertility put pressure on them to have unplanned children.

> The way people look down on you when you don't have a child at a certain age leads to people having children recklessly. They will say you don't have a child at this age, they must be something really wrong with you. Hence you end up having children without intending too (40 yo man, #19).

> I think that there is this stigma that when you are HIV positive it is a bad thing, it is not seen as any other disease and people are not open to get tested, because they are not treated the same as someone who is HIV negative. I think we need to deal with this stigma because people think that HIV positive people are dirty or something (32 yo man, #21).

Some men commented that they had fewer opportunities to interact with the health care system making it challenging to get tested or engage in care.

> As for men, they rarely visit the clinic pertaining health-related issues. Hence, they rarely get tested for HIV. Whereas women cannot access contraceptives in the local clinic without getting tested for HIV first. So, for

> women, at times it is not that they want to get tested for HIV, but for them to get the medical assistance they must undergo certain tests, which most times include HIV test (27 yo man, #16).

Men commented on the lack of access to PrEP, which made it challenging to use consistently and rely on it as a safer conception strategy.

> So I just think that it's (PrEP) not like the ARV pills that you are easily able to access from anywhere you are so it's very easy for a person to forget taking this PrEP pill, and if they do then they are more at risk when they actually do get intimate with their partner (42 yo man, #24).

Some men described that COVID-related lockdowns, fears of disease, and economic impacts had resulted in poorer access to HIV services as well as re-evaluation of their reproductive goals and needs.

> COVID has changed a lot, even people's plans to have children. I have seen many people who have given up hope, so a lot has changed regarding men and the plans we had (Missing age, #13)

> There were some challenges regarding clinic appointments, because some individuals who we collect treatment with, missed their appointments and thus could not collect their treatment on time. Hence when they arrive at the clinic there were told, "You must stand here, because you were supposed to come on this date". So, yeah there were challenges (45 yo man, #2).

One participant felt that the COVID pandemic had reduced the number of people getting tested for HIV in his community.

> I think the pandemic has affected the testing rate for HIV because many people are afraid to visit the local clinics. This is because in the beginning of the pandemic we were advised to stay at home and try to avoid visiting healthcare facilities. So, since people were staying home, those who wanted to get tested could not get tested. The problem is that all the attention is now given to the coronavirus (26 yo man, #25).

Discussion

Although MWH are less likely to initiate treatment and engage in care (Sileo, Fielding-Miller, et al., 2019), our findings suggest that they have some awareness and favourable attitudes towards services that support their reproductive goals. We maintain that men's motivations to meet reproductive goals could be leveraged to promote testing, engagement, and retention in care, and testing, treatment, and prevention opportunities for partners. In our study, two-thirds (68%) of MWH expressed a desire to have a child or more children with their primary partner in keeping with findings from prior work conducted with MWH in South Africa (Mantell et al., 2014; Matthews et al., 2013; Taylor et al., 2013). Our findings also suggest that MWH are motivated at the individual level to engage in care so they can be alive and healthy to support HIV uninfected children. At the couple level, MWH desired to have a healthy partner and were motivated to remain in care and support their partners to access HIV prevention or care services to meet their reproductive goals of having HIV uninfected children. At the community and structural level, we found that MWH were motivated to engage in care because they want to be seen and respected as fathers who provide for their families. Overall, results from this study indicate that our prior safer conception programme ('Sinikithemba Kwabesilisa') for MWH in urban KwaZulu Natal may be feasible, appropriate, and acceptable for MWH in rural KwaZulu Natal. The provision of comprehensive safer conception education and training to improve communication and problem-solving skills may be an important strategy to engage MWH, especially those not receiving treatment or retained in care (Matthews et al., 2022).

These results corroborate findings from previous work done by our team in South Africa, where men aged 25–45 years, living with HIV but not on treatment expressed enthusiasm for safer conception services to meet their reproductive goals (Matthews et al., 2021). In contrast to that study, however, this present study was done in the era of test and treat, and highlights ongoing opportunities to integrate comprehensive reproductive health services for men with HIV care and treatment

services to promote retention in care and prevention opportunities for partners (Matthews et al., 2021). Additionally, HIV programmes in community settings that incorporate conversations about reproductive goals can promote HIV care-seeking behaviours about MWH (Matthews et al., 2018). In this study, men articulated the need for peeraligned messages to promote adherence and treatment within the context of meeting their reproductive goals. The desire to be seen as providers for their families and the desire for peer support as motivators for engaging in care have also been documented in a previous qualitative study conducted among MWH in Uganda (Sileo, Reed, et al., 2019).

Though about half of MWH in our study reported being on ART for over 10 years, most expressed limited awareness about treatment-mediated viral suppression as a strategy to reduce HIV transmission to un-infected partner and perinatal transmission while trying to achieve their fertility goals, consistent with findings from previous qualitative studies conducted in South Africa (Mathenjwa et al., 2022; Matthews et al., 2021), Uganda (Ngure et al., 2017), and the U.S. (Matthews et al., 2021). While much improved, our findings suggest that providers offering care to MWH should prioritise discussions around reproductive goals and offer safer conception strategies that are aligned with HIV treatment and prevention goals (e.g. TASP, PrEP). Previous implementation studies reported high uptake of safer conception strategies including ART, PrEP, condomless sex timed to peak fertility and male circumcision when offered to sero-discordant couples (Heffron et al., 2019; Matthews et al., 2016; Schwartz et al., 2014; Wagner et al., 2015). However, more recent studies have suggested that safer conception care could be aligned with broader HIV treatment and prevention goals with an emphasis on ART/TaSP for partners with HIV and PrEP for un-infected partners, and less focus on sperm washing and condomless sex timed to peak fertility, which have been found to be challenging for diverse populations across sub-Saharan Africa (Matthews et al., 2021; Matthews et al., 2022; Schwartz et al., 2016).

We observed several other barriers to male engagement despite motivations to engage in care to meet their reproductive goals. Excessive alcohol consumption was expressed as an important barrier to adherence to treatment and being able to support healthy children. This finding is supported by multiple studies, where alcohol misuse is a barrier to male engagement in care and viral suppression (Azar et al., 2010; Bonnevie et al., 2020; Lusambili et al., 2021; Miller et al., 2021), and suggests the need to consider alcohol treatment and support programmes in designing interventions to promote male engagement. Lack of trust, poor communication skills and fear of disclosure were important couple-level barriers to men engaging in care or supporting their partners to access HIV prevention services. Additionally, some men expressed that community stigma, fewer interactions with the health care system, and COVID/ COVID lockdown measures were barriers to engaging in care. Some also indicated that the economic downturn from COVID had led to a re-evaluation of their reproductive goals and needs. These barriers are in keeping with findings from other past studies conducted among men with HIV in sub-Saharan Africa (Nardell et al., 2022; Sileo, Fielding-Miller, et al., 2019; Tibbels et al., 2019). A previous South African study involving 443 heterosexual couples found that men reporting hazardous alcohol use were more likely to report less trust in their relationship compared to men who abstained from alcohol. However, this was a cross-sectional study and the directionality of the association could not be confirmed in the study (Woolf-King et al., 2019). Meanwhile, a recent study among 100 adults (men and women) from Uganda noted mixed responses about the impact of COVID-19 on ART adherence and access to care (Linnemayr et al., 2021). Our findings underscore the importance of engaging men in diverse settings including clinic and community-based settings where a constant evaluation of men's reproductive goals is prioritised.

Implications

This study found important policy and practice implications for providers, policymakers and researchers involved in developing and implementing interventions to promote male engagement.

Men with HIV value and strive to achieve important reproductive and fatherhood goals. Comprehensive reproductive health services can be prioritised for men with HIV taking into account their reproductive goals and how they could be leveraged to optimise their retention in HIV care and promote testing and prevention for their female partners (Matthews et al., 2022). Similarly, programmes that address and prioritise men's values at the individual level, couple level and community level while addressing gender-related barriers should be promoted (Hendrickson et al., 2019; Naugle et al., 2019). The fact that men were more aware of safer conception care and opportunities is an encouraging evolution compared to prior work conducted in an urban community in Kwa-Zulu-Natal province, South Africa (Khidir et al., 2018) and suggests that the structural barriers to offering this care are slowly ameliorating. Clinic-based interventions that minimise individual and couple-level barriers faced by MWH such as making clinics more welcoming, increasing access to safer conception programmes for MWH living in rural places, promoting communication skills training to facilitate disclosure, and providing clinic-based educational interventions with an emphasis on PrEP and U = U education could offer promising results (Khidir et al., 2018; Mathenjwa et al., 2022; Matthews et al., 2022). Meanwhile, community-based programmes including peer support programmes and alcohol risk reduction programmes that address fatherhood goals and opportunities to achieve them are recommended. Community-based programmes may have a broader reach and could address barriers and challenges associated with clinic-based interventions including healthcare provider stigma and the low desirability of men to attend clinics (Matthews et al., 2022). Implementation science research studies are needed to better understand barriers and effective strategies needed to promote the optimal clinic and community-based delivery programmes for MWH and their female partners.

Strengths and limitations

A major strength of this study is that it provides insight into the reproductive goals of men and how they can be leveraged to promote engagement in care for men and support their female partners to access prevention or care services, thereby minimising HIV transmission and/ or perinatal transmission, an understudied area in the literature. However, several limitations should also be noted. First, this qualitative study explored perspectives of MWH from rural KwaZulu Natal, South Africa, and did not take into account other geographies, men from urban settings, nor the perspective of female partners. Second, men in this study were already engaged in care and most had been on treatment for at least 2 years. It is likely they were more motivated and empowered to engage in care. Third, although participants commented on their own experiences, they also shared their thoughts on the experiences of other men in their communities based on 'hearsay' which are never quite as robust as data from quantitative findings. Fourth, over two-thirds of the men reported that their primary partners were HIV positive, and only about a third reported being in serodifferent relationships. Fifth, interviews were conducted virtually by phone due to the COVID pandemic. Some participants had network connection problems since they were mostly from semi-rural areas or had issues with their batteries dying during the interview. Additionally, although interviews happened after several interactions with the participants, there were some limits to establishing rapport through telephonic interactions. However, the overall quality of the data did not differ substantially from our experience with in-person interviews. Lastly, the sample size in this study was limited to 25 MWH, however, we were able to draw rich perspectives from MWH on opportunities and barriers to engaging in care.

Conclusion

Our study highlights the reproductive goals of MWH including motivations and challenges at the individual, couple, and community/structural levels that can be leveraged to promote male

engagement in care and treatment services, as well as prevention for at-risk female partners. Findings suggest our prior safer conception intervention ('Sinikithemba Kwabesilisa') for MWH living in urban KwaZulu Natal may be adapted to meet the reproductive needs of MWH living in rural areas of KwaZulu Natal province in South Africa. Further implementation science studies guided by these goals are needed to promote male engagement in HIV care and treatment services and increase access to HIV prevention services for at-risk female partners.

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ORCID

Oluwaseyi O. Isehunwa http://orcid.org/0000-0001-6439-0026
Lynn T. Matthews http://orcid.org/0000-0001-6167-6328

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