


# Qualitative Identification of Intervention Preferences to Support Men's Engagement and Retention in TB Care in South Africa

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## Abstract

Globally and in South African specifically, men account for 56% and 62% of all tuberculosis (TB) cases, respectively. Men are at increased risk of not accessing TB testing or treatment, and having poor treatment outcomes. Unfortunately, no interventions exist to address these issues. Toward the development of targeted, patient-centered TB care and support interventions, we used semistructured interviews to explore men's social network composition, TB testing behaviors, disclosure and treatment support, clinical experiences, and TB's influence on daily living. Data were analyzed using a thematic approach guided by the Network Individual Resource Model to identify mental and tangible resources influential and preferred during engagement in TB treatment. Men emphasized the desire for peer-to-peer support to navigate TB-related stigma and unhealthy masculinity norms. Men advocated for awareness events to educate communities about their challenges with TB. Men strongly suggested that interventions be delivered in familiar locations where men congregate. Since 2022, no TB treatment support interventions have included the preferred components or delivery modes described by men in our study. To improve men's TB-related health outcomes, the global TB community must identify and address men's unique challenges when designing interventions.

## Keywords

tuberculosis, men, intervention preferences, South Africa

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## Introduction

Since 1998, the World Health Organization's Global Tuberculosis (TB) Reports have reported data that cis-gender men carry a disproportionate burden of TB (*Global Tuberculosis Reports from, 1997* [internet], 2020; World Health Organization, 1998). It was not until 2013 that the Global TB Report purposefully stated that men had a higher burden of disease, likely due to a combination of greater risk of exposure and higher burden of risk factors for TB disease and poor outcomes (Dodd et al., 2015; Druyts et al., 2013; Murphy et al., 2018; Horton et al., 2020; Horton, Sumner, et al., 2018; Lönnroth et al., 2008; Nhamoyebonde & Leslie, 2014; Watkins & Plant, 2006; World Health Organization, 2013). In low- and

middle-income countries (LMICs), the situation is dire. An aggregate analysis of TB prevalence studies from LMICs identified a male-to-female prevalence ratio of 2.21 for bacteriologically confirmed TB and 2.51 for smear positive TB (Horton et al., 2016). A comparison of prevalence-to-notification ratios reported that for every 2.6 cases of TB among men one case was notified, compared with 1.6:1 among women, suggesting that men are disadvantaged in seeking or accessing TB care (Horton et al., 2016). Despite men's higher burden of TB morbidity and mortality (Chikovore et al., 2020; Horton et al., 2016; Mlotshwa et al., 2016; Reniers et al., 2017; World Health Organization, 2020), there has been little global policy or action supporting men's health within the TB



space, and the global TB and health communities have yet to show any concerted effort to decrease these significant gendered disparities (Horton, White, et al., 2018).

Findings from South Africa's 2018 National TB Prevalence Survey revealed a TB prevalence of 1094 (95% confidence interval [CI]: [835, 1352]) per 100,000 among men, compared with 675 (95% CI: [494, 855]) per 100,000 among women (South African National Department of Health, 2019). This is exacerbated by reports that men are less likely to report TB-related symptoms, get diagnosed, smear convert, or complete treatment, suggesting that outcomes along South Africa's TB cascade are worse for men than women (Horton et al., 2016; McCreech et al., 2016; Mlotshwa et al., 2016). Work from South Africa estimates that >50% of TB infections among men, women and children are due to contact with adult men, suggesting that care and control of TB among men is key to epidemic control (Dodd et al., 2015). Men in SA have a shorter life expectancy than women, due in large part to TB. Specifically, among those the HIV, 81% of the 11.2 year life difference between men and women is due to TB, and among those without HIV, 43% of the 13.1 year life difference is due to TB (Reniers et al., 2017).

Despite the significant gendered disparities in the burden of TB, no interventions have been developed to address men's poorer TB outcomes. This is highlighted by a 2018 meta-analysis of 129 TB adherence interventions, of which no male-centered interventions were identified, and only a limited proportion ( $n = 34$ ) disaggregated their results by sex (Alipanah et al., 2018). Of those studies with sex-disaggregated results, 17 interventions reported that women experienced significantly better outcomes compared with men, 15 reported no differences by gender, and none reported better outcomes among men compared with women. At worst, this uneven reporting of

sex-disaggregated results may perpetuate gendered disparities (Cornell et al., 2020). At best, poor reporting of sex-disaggregated results makes it difficult to identify TB support interventions, or components thereof, that can be adapted or optimized to improve men's TB treatment outcomes and thus decrease gendered disparities.

Men's sense of masculinity and manhood are strongly associated with their social and health behaviors, both of which impact their engagement and retention in TB care and treatment (Chikovore et al., 2014, 2017, 2020; Daniels et al., 2021). When men are ill, their emotional needs and uptake of health services are typically de-emphasized or considered secondary to familial financial contributions and responsibilities or the need to be perceived as strong (Hosegood et al., 2016; Sherr, 2010). Consequently, accessing clinic services is seen as a last resort, as stigma and weakness shaming impacts upon their sense of manhood (Chikovore et al., 2014, 2017, 2020; Daniels et al., 2021; Nyamhanga et al., 2013). Given that, men primarily value resources over health, understanding the mental and tangible resources that may facilitate men's engagement in care, and how men's sense of manhood and masculinity influence their access these resources is of significant importance (Daniels et al., 2018; Johnson et al., 2010).

Men, individually and collectively, are typically blamed for their own poor health outcomes, especially when impacted by their own sense of manhood and masculinity (Chikovore et al., 2017). This has allowed health systems and the global health community to minimize their own responsibility to respond to the barriers and challenges men face when deciding to seek or access health care. To overcome this, health systems and the global health community must acknowledge that masculinity and manhood social norms may result in unique challenges and barriers to men's accessing of health

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services. Ultimately, to reduce the burden of TB, poor TB outcomes and ensure that men optimally engage in TB care, tailored interventions must be informed by their needs and preferences. We qualitatively explored men's health behaviors associated with access to and retention in TB care with the objective of understanding men's preferences for the content and modes of delivery of interventions to support their engagement and retention in TB care and treatment.

## Method

### *Study Population and Setting*

Between August and November 2018, we conducted an exploratory study with men who were currently or recently engaged in TB care in public health clinics in Buffalo City Metro Health District (BCM-HD), Eastern Cape Province, South Africa; Eastern Cape has the highest rates of multidimensional poverty in South Africa (Statistics South Africa, 2016). BCM-HD has a population of 834,997 of which 85.4% (713,087) are black Africa; of those, 92.3% (658,179) are of Xhosa heritage (Statistics South Africa, 2016). In 2018, BCM-HD had an estimated incidence of 831/100,000 population of microbiologically confirmed pulmonary TB cases, one of the highest in South Africa, of which men accounted for 64.1% of cases (National Institute for Communicable Diseases, 2017).

### *Participant Recruitment*

As previously described (Daniels et al., 2021), two cadres of men were recruited from nine public clinics in BCM-HD. Cadres were defined as: 1) those that recently completed their TB treatment within the past 3 months; and 2) those currently engaged in TB care and treatment and had finished the intensive phase of therapy. To maximally protect study staff from study-related exposure to TB, we excluded from recruitment TB patients with a positive smear grading at treatment initiation without a post-intensive phase smear conversion. Using these cadre case definitions, a potential participant list was generated via review of clinic-based medical records with the assistance of clinic staff reporting to the BCM Department of Health. All participants were aged  $\geq 18$  years, male, resided in BCM-HD, and identified as Xhosa;  $>90\%$  of TB patients attending study clinics are Xhosa. Trained study staff, who themselves were Xhosa men, contacted potential participants via phone to introduce the study. If interested, men were scheduled to come to a study site, provide informed consent, and be interviewed.

### *Data Collection*

We developed a semi-structured in-depth interview (IDI) protocol in domains grounded in the literature on men's TB, HIV and general health care experience (Chikovore et al., 2016, 2017; Creswell & Poth, 2016; Siu et al., 2014). Interview domains included: social network composition, TB testing, treatment support, clinical care experiences, disclosure to and support from family and friends, and the influence of TB on daily living. Two Xhosa male staff members who lived in the study catchment areas were trained on the study protocol and in qualitative interview methods. These research team members then conducted interviews in the participant's preferred language (e.g., English or isiXhosa). The research team was composed of qualitative researchers who held weekly meetings to discuss and refine interview and data collection processes. Interviews were audio-recorded, translated, and transcribed into English for analysis by research assistants from the study team. Another research assistant assessed transcripts for accuracy by reviewing a random selection of transcripts against the respective audio-recording.

### *Theoretical Framework*

We applied the Network-Individual-Resource (NIRM) model to guide analysis for intervention preference identification (Johnson et al., 2010; Kaufman et al., 2014). The NIRM recognizes the interconnectedness of individuals and their significant social networks throughout life. This connection is based on tangible (e.g., material and energy stores, income, possessions, physical health) and mental (e.g., attitudes, perceived or actual norms, social support) resources possessed by the individuals and their networks. It emphasizes that social factors have a direct influence on behavior, even if the individual disagrees with the behavior (Kaufman et al., 2014). Focusing on how men discussed preferences for the tangible and mental resources of TB interventions within individual and social networked power dynamics, researchers qualitatively examined themes (Daniels et al., 2018; Johnson et al., 2010; Kaufman et al., 2014; J. W. Mitchell et al., 2016).

### *Data Analysis and Reporting*

Thematic analysis was conducted over 4 months by three members of the research team (JD, LDV, EG) (Mabuto et al., 2021; Moodley et al., 2020). First, a sub-set of transcripts were coded to identify mental and tangible resources for TB treatment as per the NIRM model with codes given positive or negative connotations to better

identify the context in which certain resources influence behaviors or experiences. These “resource” codes were discussed by the team, and then compiled into a codebook that was then applied to all transcripts. Researchers independently coded randomly assigned transcripts. During weekly team meetings coding were reviewed to ensure proper application and assess intercoder reliability. Any variance in coding and/or interpretation was discussed by the team with a few additional codes added and subsequently applied to all transcripts.

After coding was completed, a frequency analysis was conducted to generate an initial list of preferred and not preferred resources for TB treatment. These resources were subsequently categorized into matrices, distinguishing between positive and negative mentions while assessing depth of discussion (i.e., references to two or more: places, people, actions, emotions, perspectives) (Mabuto et al., 2018). Memo writing and causal diagrams explored and refined emerging resource preference trends and preference combinations or packages based on TB treatment stage (Birks et al., 2008; Chikovore et al., 2016). Preliminary results were presented to the full research team every 2 weeks, informing further analysis that applied the same analytical procedures until final themes were outlined.

### Data Representation

In-text quotes are a selected representations of all participants by age and TB treatment stage. In-text quotations use the following notations: Aged in years, plus TB Treatment Stage (i.e., In Treatment or Completed Treatment).

### Ethics Approval

Ethics approval was obtained from the Foundation for Professional Development Research Ethics Committee (Registration No. REC-03711-033-RA; Approval No. REC-7-2018). Permission was provided by the Eastern Cape Provincial research committee and the BCM Department of Health. Written informed consent was obtained from study participants prior to data collection.

### Results

We interviewed 30 men aged 23–60 years (median: 35.5 years  $\pm$  8.9) between August 1 and November 30, 2018 (currently engaged in treatment = 15; recently completed treatment = 15). Highly preferred, emergent preferences were based on the need to harness existing mental and tangible resources for TB treatment support: Peer-to-peer support (mental and tangible), Men's social spaces

(mental and tangible) for intervention delivery, and Community connectedness via awareness-raising (mental).

### Giving and Receiving Peer-to-Peer Support During TB Care and Treatment

Several participants described a desire and willingness to support other men during their TB experience with both tangible and mental resources (Supplemental Table 1). While participants recognized the importance of clinic-based care and treatment, they also recognized that men's fear relating to clinic attendance may be assuaged if accompanied by other men. Assistance in submitting sputum to the clinic for testing or collection of medication may facilitate accessing of diagnostic services and ensuring a steady supply of medication refills. Drawing from his own feelings of “nearly dying,” this participant states a willingness to assist other men to get tested:

Even my friends who cough, I tell them to go to the clinic. If he is scared of the clinic, I will do it for them [and] bring the sputum bottle. Even I was also scared [to go to the clinic], but now even if I feel a small thing I don't hesitate [to go to the clinic]. I nearly died [from TB]. (34 years, completed treatment)

I would give him words that encourage him. Or in the case that he is shy to go pick up [treatment] at the clinic, I wouldn't have a problem with going and fetching the treatment for my friend. (40 years, in treatment)

In addition to supporting their male peers by accompanying them to clinic, returning sputum specimens to the clinic and picking up medications, men emphasized the need for emotional support from other men. One participant explains,

They [men] need people to understand and have someone they can talk to. When you don't have someone to talk to, it is the same as if you are locked up within yourself. I would be happy if I knew that my friend is taking this treatment and is having a problem, so I could also advise him to try this way [taking his medication with a meal etc], as far as I can help him. (29 years, completed treatment)

Men struggle with their treatment, feel isolated, and are unable to discuss and navigate stress associated with TB infection and care, including disclosure. Many men described apprehension with disclosing their TB infection to immediate family members and partners. One participant stated that his family “*didn't really accept [my disclosure] nicely especially my mother. She was really hurt because she is the one who was telling me to stop smoking.*” – 26 years, in treatment. Men's lifestyle and

socializing with other men were perceived to increase their TB risk, such as smoking and drinking, and these were used to blame and shame men for having TB infection. In turn, men were isolated from their families and households or had relationships due to TB infection and disclosing their status (Supplemental Table 3):

What I think is important is that households or each house should know that a person does not request to have TB and that TB spreads in many ways. By them not supporting the person who has it [TB], you end up all being infected in that household, this sickness is infectious. (44 years, completed treatment)

She [girlfriend] did not take it nicely at all [when revealing TB status]. I could see she was ashamed of me whenever I went to visit her. She would open all the doors, not that there was anything wrong with that because there should be open space fresh air. Also I could see she did not want me anymore due to the fact that she told me we can't have sex anymore because I had TB. So we broke up. (50 years, in treatment)

Men described experiencing rejection after diagnosis, which negatively impacted their masculine identity of being in control and charting their destiny.

However, some participants mentioned using their experiences as a pathway metaphor to speak with other men about navigating such stress and treatment planning as a way of providing support rather than contributing to men's isolation when ill:

I would show them [men] myself as I have walked the same path [experiencing TB treatment]. It is not easy taking this treatment, but I would show the friend a living example, which is me. I have completed [treatment] in front of him and pray that I will be a better example to him since I also come from the same situation. I have swam and crossed and he also can swim across. (26 years, completed treatment)

I would be an example to him and tell him more about how good the treatment is. I would tell him about how bad I looked and how I tried to eat good diet. (33 years, in treatment)

Men identified specific mental resources (e.g., logistical advice and emotional support) that they can offer to other men with TB so that they can "swim across" like: sputum bottle collection, role-modeling, food planning, and disclosure to others for additional support. Men believed that other men that successfully completed TB treatment were key to their own TB treatment success, since they can understand what they are going through while ill as well as the specific support they need during treatment.

## Men's Spaces, Men's Secrets, Men's Engagement

Many men talked about spaces where they feel comfortable talking about men's issues and suggested that these spaces may be conducive for a conversation about TB. A common theme was that the spaces were primarily dominated by males. Many participants alluded to the culture of Xhosa men and how it influences health conversations in spaces where men congregate. As one participant stated,

We, as men, have a lot of secrets and more especially Xhosa men, they are stubborn, I do not want to say they are clueless, yes stubborn is the word. They need a comfortable environment like when we talk about things. . . This is when we are drinking alcohol, that's when people can talk openly. (26 years, completed treatment)

Speaking to the reality of being a Xhosa man, this man explains how to navigate their "stubbornness" in relation to discussing health issues. He provided insight into Xhosa culture, explaining that they have secrets they discuss in male-dominated spaces, away from partners and families. Another participant identified a male space in the community and highlighted the importance of building rapport with men before starting sensitive discussions:

There near the [community] toilets because that's where you normally find men sitting and playing dice. You know even if you come and stop here, and since you also know me my brother, it will be easy to come and start a conversation and a lot of people will listen. (29 years, completed treatment)

Men socialize in different venues, where they may share knowledge with each other, including information about TB testing and treatment. The participant invited the interviewer to such spaces to talk about TB to other men in the community. Echoing the previous participant, it was important for Xhosa men to feel comfortable before addressing potentially sensitive issues, and suggested building rapport before engaging with these men. He explained that once a relationship was developed, men would feel safe and willing to discuss their "secrets" and invite such conversation into their space. Identifying safe spaces for men is a vital step because it is where they socialize, talk to other men, and play games. These participants emphasize that before interventions are implemented, the physical locations where social interactions occur must be understood, with invitations from members.

Taverns were identified as a male space where TB discussions are needed, since these were perceived as places where TB transmission occurs; but taverns were also

described as challenging for these discussions since drinking is involved:

What I have noticed it all starts [TB transmission] around the taverns, cigarettes and the sharing of beer there at the taverns, where we should start with the information is there at the taverns. So these interventions must be held in places where people are in their comfort zones. (26 years, completed treatment)

It will be hard but sometimes things need to be tried in a different way, like if [we] could ask the tavern owner to address men [about the] issue revolving [around] TB, maybe they will listen. (41 years, in treatment)

Men share beers and smoke cigarettes in taverns. As a result, it was stated that men need to be educated about how TB is transmitted through such behaviors at the site. However, men were unsure if other men would listen given the priority on drinking and socializing with other men.

### ***Men's Need for Community Connectedness Through Awareness Raising***

Most men also reported feeling isolated by the community and receiving a lifetime label of TB. This led many participants to communicate to other men about how TB will have an impact on their lives even after treatment:

I can advise them [men] to not talk to everybody because others will isolate him because of TB. [I can advise them] to use treatment and adhere to his treatment because it will help him. Even if he [is] treated for TB, the community will still treat him as if he still has TB. (43 years, in treatment)

In general, most men highlighted how unsupportive their communities can be to those experiencing TB, hindering disclosure. Most described personal experiences of unsupportive communities that they wanted to share with other men to prepare and help them navigate social exclusion due TB infection. For some men, experiencing this isolation fueled their fear of rejection by individuals outside their TB support network. Many described the discomfort of engaging with community members outside their support network for such needs as food, and suggested that it lead them to consider skipping treatment, and implied that other men may have the same experience:

It is embarrassing to go to the next door neighbours and ask for food. . .maybe there are a lot of people who want to take their treatment, but there are things that they wish they had but don't have, so they end up not taking this treatment. (29 years, completed treatment)

If men have to ask for food, then it shows others that they are weak and unable to provide for their families in a context where men need to be strong providers because, "*your life is depending on you and other people [family] are also depending on you.*" – 49 years, completed treatment. Some men would rather skip treatment for the day than be exposed as someone who cannot provide for his dependants. Participants felt that if the community understood the additional challenges facing TB patients on a daily basis, they could create a comfortable environment in which men with TB could ask for support from those outside their direct network.

Many participants envisaged large-scale community and family-centered TB awareness-raising events, promoted through text messaging and loudspeaker announcements, as the following quotes suggest:

It can work that thing [text messaging]. Although others would look at and ignore it, otherwise it could work. (38 years, in treatment)

We can ask a person to loud hale [loudspeaker] in the township to tell them that on the stated date, time and venue we ask them to come there. (43 years, in treatment)

On weekends make something like a promotion for TB. You go there with a poster and things plugged on the walls that say 'let us prevent TB' and if you already have it here are the things you will face. Try make it something fun and also have a mobile testing station. . . (24 years, in treatment)

The day should be like an open day where you can come with your partner and get tested for whatever. They can create a chance to reach many people because men are shy to go and get tested at the clinic. You can call your friends to come join you at 'such and such' function. . . When they get there they will end up participating in one of the activities. If something like this can be introduced in community halls, sports fields and schools. (24 years, in treatment)

These participants imagined different approaches to get men educated and aware of TB testing and treatment with some approaches perceived as not effective for everyone such as messaging mobile phones. Important to men was to get their whole community gathering to learn about TB and how to advocate for others to respond to TB by offering services like testing in a fun, dynamic manner. They suggested that men may need encouragement to attend like opportunities to meet others and also to bring friends who can gain benefit from TB education and testing. But, they also suggested that the whole community needs to be involved to adequately promote TB awareness and what is needed for treatment like food. Frequent events similar to the ones mentioned above may help men be open about discussing needs,

challenges, and successes to others, like family and male friends, so to support their TB treatment.

## Discussion

Men in our study identified preferences for components and modes of delivery for support interventions during TB care and treatment. These preferences built upon their existing resources, including other men in their social network, but did not identify clinics as sites for such interventions, reflecting similar studies that reported clinics an unwelcoming environments for men (Dovel et al., 2020; Johnson et al., 2010). Men emphasized their desire for a peer-to-peer support dynamic in familiar locations where men congregate. Their experiences of individual and community-level stigma and isolation directly informed their advocacy for community awareness events focusing on the additional challenges facing TB patients. To date, none of these preferences have been included in TB support interventions or programs (Alipanah et al., 2018), suggesting that researchers, interventionists and policy makers have either ignored men's voices, or perhaps never sought their input.

There was a strong consensus among men in our study for support interventions that include their peers with whom they can discuss shared illness experiences and ways to manage their treatment (food access, dosing, etc.) while maintaining their work and family responsibilities. Peer-support needs were strongly connected with and in response to men's experienced isolation, or threatened masculine identity, perpetrated mainly by family members and sexual partners. Men stated that they were embarrassed to ask family or neighbors for food when ill because such an ask would imply weakness, which would in turn threaten their manhood and may result in their isolation by household members. Unfortunately, despite a close search of the literature, we have been unable to identify any TB-specific, male-centered peer support intervention that would help men navigate such challenges or barriers (Alipanah et al., 2018). The only interventions incorporating other men appear to be provider-facilitated psychosocial support groups, and community-based directly observed treatment, short course (DOTS) (Acha et al., 2007; Demissie et al., 2003; Henk Eggens, 2014; van den Boogaard et al., 2009; Zvavamwe & Ehlers, 2009). Unfortunately, none of these interventions incorporated peers as the primary supporter nor their discomfort with clinical settings for such forms of support groups, illuminating how men's preferences or voices may not have been incorporated into previous interventions (Krishnan et al., 2014). This is in contrast to the global HIV community which has described the importance of listening to men's voices, tapping into men's networks and understanding men's leadership in

supporting other men to test for HIV or engage in treatment (Gupta et al., 2016; Hill et al., 2018; Kanters et al., 2016; Moudachirou et al., 2020; Sileo et al., 2018).

Men in our study expressed a preference and advocated for delivering support interventions in spaces where men are readily available and are already engaging in social activities and knowledge exchange with other men. Men in our study mentioned taverns, shebeens, and places where men play games as safe spaces in which to engage about health issues, offer screening or testing services, and provide treatment support. While these and sporting events have been previously suggested and used to engage men, (Grammatico et al., 2021; Ntombela et al., 2021) other gender and culturally sensitive spaces should also be considered. In Xhosa culture, kraals may be particular amenable to engaging in sensitive health conversations; a kraal is a masculine space where adult Xhosa men meet and discuss matters of importance to the community, provide advice to younger men and perform traditional ceremonies (Bank, 2015; Right to Care, 2020). Such spaces are key to implementing tailored interventions for men, by men. Drawing from the HIV literature, acceptable and feasible interventions that reduced HIV-risk behaviors and improve treatment adherence can be delivered to men in male-oriented venues (Kalichman, 2010), however, intervention delivery in drinking venues has not been reported to be efficacious (Fritz et al., 2011). Ultimately, the delivery of TB care and treatment support interventions that builds upon men's voices, perspectives, and local contextual insights are key to the uptake and effectiveness of male-centered interventions (Alipanah et al., 2018).

While the global TB community recognizes TB-related stigma as a serious barrier to optimal TB outcomes (Jaramillo et al., 2017; E. Mitchell & Daftary, 2017; World Health Organization, 2015), it remains relatively underexplored. Though both men and women encounter TB-related stigma, how that stigma impacts their health behaviors are likely gender specific (Hudelson, 1996; Karim et al., 2007; Krishnan et al., 2014). In our study, men reported anticipated stigma manifesting as fear of disclosing or discussing their TB status to friends, family, and neighbors, since they expected to be shamed or blamed for their infection. Men described enacted stigma that manifested as social isolation in their household. Such stigma dynamics generated disclosure hesitancy which in turn hindered their ability to secure food that would allow them to take their medication. Men's stated intervention preferences were often in response to their stigma-related experiences. Specifically, men suggested community awareness campaigns and peer support to combat misinformation, isolation, and stigma. Such intervention components could be imagined as *consciousness raising* activities (Daftary et al., 2017) and trained peer

supports who can provide skill-building and support for navigating around perceived and enacted TB stigma, as well as a safe space outside the clinic for addressing unhealthy manhood and masculinity norms that men may experience when ill.

We note some limitations of our study. First, we only interviewed men who were currently engaged in or who recently completed treatment. This could lead to selection bias, as men who had not engaged in TB care, a vital population for TB transmission, morbidity, and mortality, were not enrolled in our study. By relying on the voices of men who successfully navigated the system to completed treatment, we allow this “model” population to speak for those lost-to-care and at greatest risk for poor TB outcomes. Engaging men who were lost to care may provide unique insights to inform future interventions aimed at supporting TB patients before such disengagement. Second, among men who recently completed treatment, preferences were measured retrospectively. Given that participants were reflecting on what they wish they had received during treatment, their stated needs may not align with behaviors during treatment (Craig et al., 2017). Given that these voices were retrospective reflections, real-time or near-real-time factors impacting treatment adherence and retention in care need to be collected to understand more holistic adherence approaches. Toward this, perhaps, innovative approaches, such as integrating ecological momentary assessments (Dietrich et al., 2018; Shacham et al., 2019; Shiffman et al., 2008; Smiley et al., 2020) with medication event monitoring systems (Bionghi et al., 2018; Haberer et al., 2010; Pellowski et al., 2016) could allow for such real time or near-real time factors to be ascertained. Third, we did not interview women. Consequently, some of the needs and preferences that men state may not necessarily be male-specific. To address this concern, future studies must include women. This may further allow us to explore how experiences that both men and women face (i.e., gender-neutral experiences) may differentially impact their behaviors and outcomes (i.e., gender-specific impact on behaviors) and thus inform gender-responsive interventions.

Men bear the disproportionate burden of TB morbidity and mortality (Chikovore et al., 2020; Global Tuberculosis Reports from 1997 [internet]., 2020; Horton et al., 2016; Mlotshwa et al., 2016; Reniers et al., 2017). Yet, with very few exceptions, the global TB community, international and national policy makers and donors have not addressed these grave gendered disparities (Horton, White, et al., 2018). Global HIV prevention and treatment efforts have reported that empowering women to prevent HIV infection, as well as to address and overcome barriers to accessing care was crucial to addressing their needs and curtail the epidemic (Chimbindi et al., 2018; Wamoyi

et al., 2020). Yet, it became clear that not addressing men was a mistake, and that interventions that engaged men and their communities, and focusing on healthy masculinity, were highly successful (Kyegeombe et al., 2014; van Rooyen et al., 2016). Given TB's gender inequities and our findings, we recommend: 1) the de novo development or adaptation of gender-responsive, peer-to-peer support interventions aimed at retention and engagement in TB care, 2) that local and national TB programs be intentional in their inclusion of men as part of primary and community health care staff complement that provide care, treatment and support to men with TB; and 3) that men be empowered to challenge unhealthy masculinity norms that impact their health, and 4) that men be engaged them to inform interventions that address the barriers they face in accessing and engaging in TB care and treatment. Arguably, it is an ethical imperative to fund intervention research and development efforts to reduce the gendered inequities associated with TB outcomes, as the current one-size-fits-all approach is clearly not working, and continuing to ignore men will sustain and worsen the epidemic for all.

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### **Data Availability Statement**

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

### **Declaration of Conflicting Interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## Supplemental Material

Supplemental material for this article is available online.

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