



Original investigation

Qualitative Exploration of a Smoking Cessation Trial for People Living With HIV in South Africa

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Abstract

Introduction: In South Africa, people living with HIV have a high prevalence of smoking, which undermines the beneficial effects of antiretroviral therapy. However, little is known about barriers to smoking cessation and what interventions work for people living with HIV in this setting.

Methods: A randomized trial comparing intensive anti-smoking counseling versus counseling and nicotine replacement therapy was recently concluded in Klerksdorp, South Africa. In a post-trial follow-up, 23 in-depth interviews with patients and one focus group discussion with counselors from the trial were conducted. A codebook was developed and codes were applied to the transcripts, which were analyzed using a thematic analysis.

Results: Barriers at the economic, social/interpersonal, and individual levels induced stress, which hindered smoking cessation. Economic stressors included unemployment and poverty. Social or interpersonal stressors were lack of social support for quitting smoking and lack of social support due to having HIV. Individual stressors were traumatic life events. Alcohol was used to cope with stress and frequently co-occurred with smoking. Managing cravings was a barrier unrelated to stress. Participants proposed income and employment opportunities, group counseling, and more frequent counseling as solutions to address stressors at different levels. Nicotine replacement therapy was helpful to mitigate cravings.

Conclusions: Future smoking cessation interventions need to target barriers at multiple levels. Increasing the supply and duration of nicotine replacement therapy may increase its effectiveness. Other behavioral approaches such as group counseling or peer counseling could hold promise in this setting but need to be tested for efficacy through randomized controlled trials.

Implications: To our knowledge, this is the first qualitative study examining barriers to smoking cessation for people living with HIV in South Africa. Smoking is highly prevalent among people with HIV in South Africa and cessation interventions are urgently needed. A better understanding of barriers to smoking cessation that people with HIV face will lead to the development of contextually appropriate interventions. This study also provides feedback on interventions from a recently concluded smoking cessation randomized trial and will help guide the design of future smoking cessation trials.

Introduction

Improved access to antiretroviral therapy has led to significant declines in HIV/AIDS-related mortality in South Africa.¹ However, people living with HIV (PLWH) in South Africa have a high prevalence of smoking,^{2,3} which increases their risk of death from smoking-related diseases. HIV-infected smokers are more susceptible to developing smoking-related diseases such as lung cancer, cardiovascular disease, and chronic obstructive pulmonary disease compared to non-infected smokers.^{4,5} They also lose more years of life from smoking than from HIV.^{6,7}

Previous findings on barriers to smoking cessation that PLWH face include substance and alcohol use, using smoking as a coping mechanism to deal with HIV, the burden of taking medication for smoking cessation in addition to HIV medication, and stress.^{8,9} However, these findings come from developed countries, and there is a need to better understand barriers to smoking cessation for PLWH in less-developed countries, such as South Africa.

For HIV-uninfected smokers, behavioral counseling and nicotine replacement therapy (NRT) are independently effective in promoting smoking cessation, with increased effectiveness when provided in combination.¹⁰ For PLWH, it is unclear what smoking cessation interventions work best.¹¹ Therefore, interventions that are both effective and acceptable for PLWH need to be identified. In their research agenda for developing smoking cessation interventions for PLWH, Niaura et al.¹² recommend conducting randomized controlled trials to test interventions that work for HIV-uninfected smokers for efficacy in HIV-infected smokers. They also caution that current cessation treatments may not address issues specific to PLWH and suggest gathering information through qualitative methods to identify these issues.¹²

A randomized controlled trial was recently conducted in Klerksdorp, South Africa, to test the efficacy of intensive anti-smoking counseling versus counseling with NRT in aiding smoking cessation for PLWH. Participants in both study arms received standardized smoking cessation counseling using the 5As model of the National Cancer Institute¹³ and those in the NRT arm also received nicotine patches and gum.¹⁴ All participants received six counseling sessions at baseline, 2 weeks, 4 weeks, 2 months, 3 months, and 6 months. Sessions lasted approximately 20 min and covered topics such as health effects of smoking and coping mechanisms to deal with triggers. Participants in the NRT arm received patches and gums to cover a 10-week course of therapy with tapered dosage. This qualitative follow-up was conducted to receive feedback from smoking cessation counselors and patients about the trial interventions in order to plan for future cessation trials. The purpose of this study was to answer the following research questions:

1. What are the perceived barriers to smoking cessation for PLWH in South Africa?
2. How did PLWH in South Africa feel about counseling and NRT?

Methods

Setting

This study was conducted between August and October 2016 in Klerksdorp (North West Province), South Africa. Klerksdorp is a town located in the City of Matlosana municipality. The estimated population of this municipality is 398 676 and is predominantly Black African.¹⁵ The HIV prevalence in the municipality is

approximately 18%,¹⁶ and a recent study found a smoking prevalence of 52% for men and 13% for women with HIV in this setting.²

Participants

One focus group discussion with counselors ($n = 5$) and 23 in-depth interviews (IDIs) were conducted with patients from the parent smoking cessation trial. All counselors were non-smoking, HIV-negative males between 30 and 50 years of age and delivered counseling to patients in the smoking cessation trial. To be eligible for IDIs, patients had to (1) be enrolled in the smoking cessation trial at one of the three study clinics and (2) complete their 6-month follow-up visit. From this sampling frame, participants were purposively selected to ensure representation of sexes, study clinics, and 6-month smoking status (Table 1). All participants provided written informed consent. For IDIs, participants received ZAR 75 (3 USD) as compensation and, for the focus group discussion, snacks were provided. This study was approved by the ethics committees at the Johns Hopkins Medical Institutions and the University of Witwatersrand.

Procedures

The focus group discussion and six IDIs were conducted in English and transcribed verbatim by a graduate-level public health student with training in qualitative research. Seventeen IDIs were conducted in Setswana and Sesotho by a smoking cessation counselor trained in qualitative data collection methods. These were transcribed and translated into English by a professional transcription service. Data collection took place in private rooms at the clinics using semi-structured guides. The focus group discussion guide explored counselor perspectives on barriers and facilitators to smoking cessation for PLWH, feedback on the trial interventions, and recommendations

Table 1. Demographic and descriptive characteristics of in-depth interview patient participants in the qualitative follow-up to a smoking cessation trial for PLWH in South Africa

Participant characteristics	N (%)
Sex	
Male	16 (69.6)
Female	7 (30.4)
Mean age (years)	38
Education	
Grade 0–5	2 (8.7)
Grade 6–11	13 (56.5)
Grade 12	7 (30.4)
Degree/diploma	1 (4.3)
Clinic	
Tshepong wellness	7 (30.4)
Jouberton	9 (39.1)
Grace Mokhomo	7 (30.4)
Treatment arm	
Counseling	13 (56.5)
Counseling and nicotine replacement therapy	10 (43.5)
Language	
English	5 (26.1)
Setswana/Sesotho	18 (73.9)
6-month smoking status	
Quit (COppm* \leq 6)	7 (30.4)
Not quit (COppm* $>$ 6)	16 (69.6)

* COppm= carbon monoxide parts per million, a measure of recent smoking obtained through an exhaled breath. A cut off of \leq 6ppm was defined as non-smoking.

for future smoking cessation programs (Table 2). IDI guides explored patients' reasons for smoking and motives for quitting, barriers and facilitators to smoking cessation for PLWH, feedback about the trial interventions, and recommendations for future smoking cessation interventions (Table 2). Data collection and analysis occurred simultaneously, and guides were modified based on emerging themes. All data were audio recorded, and field notes expanded within 24 h of data collection.

Analysis

A thematic analysis was conducted. A codebook was developed, consisting of 28 codes and subcodes, covering topics such as smoking history and quit experiences, barriers and facilitators to smoking cessation, and smoking cessation interventions. Initial coding resulted in identification of broad themes, and subsequent rounds of analytical coding led to the creation of codes and subcodes nested within these themes. Transcripts were coded by a single coder using ATLAS.ti version 1.0.50. Memos were used to help with the analytical process.

Results

A majority of patients were male (69.6%); 56.5% of patients received only counseling and 43.5% of patients received counseling and NRT. At 6 months, 30.4% of patients ($n = 7$) had quit smoking (Table 1). Among those who quit, four were male and three were female; four belonged to the counseling-only arm and three were in the counseling and NRT arm.

Barriers to Smoking Cessation

Counselors and patients described many barriers to smoking cessation. These barriers occurred at the economic, social/interpersonal, and individual levels. Many of these barriers induced stress, which hindered smoking cessation (Figure 1).

Economic Level

Patient participants faced financial stress due to unemployment and poverty and five patients reported smoking to cope with this stress, as shown below:

Participant: Sometimes I feel I got a stress, then I smoke the cigarette, then it's like it's over but it's not.

Facilitator: What are these stresses that make you want to smoke?

Participant: I'm not working. I'm – you see I need some income that stuff and I can't do most of the things what I want actually want I can't afford maybe (Male, 37 years).

Even when patients were able to quit briefly, stress from not having money or work caused them to relapse (Figure 1).

In addition to stress, two counselors felt that unemployment caused boredom, which hampered smoking cessation efforts:

And a lot of people are unemployed. And because they are unemployed, they do nothing. They will resort to smoking because there's nothing they can do. That is beyond the protocol. That has to be done by people within the government, that there should be employment opportunities. Because when you are at work, you get busy. You have less time to go and smoke, and at the end of the day, because you've done it because you were bored, it's easier for you to quit smoking (Counselor).

Social or Interpersonal Level

Thirteen patients reported that lack of social support from family and friends, and peer pressure made it difficult for them to quit smoking. Patients living with family members who smoked at home were less likely to get support. Friends often ridiculed and disparaged patients' efforts to quit smoking. Taverns were particularly important triggers for smoking due to the combination of alcohol and being around smokers. Patients who successfully quit smoking did so by avoiding friends who smoked. However, this was easier for older patients who had a spouse and family to spend time with.

In addition to an overall unsupportive environment for quitting smoking, two patients also experienced a lack of support to quit smoking due to their HIV status. One female patient described being ill-treated and abused because others knew her HIV status. This exacerbated stress and led to more smoking (Figure 1):

Facilitator: Why did that (your HIV diagnosis) affect your smoking?

Participant: Because I was stressed, yeah. I was having a lot of stress.

Facilitator: If you don't mind me asking, can you talk a little bit about what the stress was. Why were you stressed?

Participant: Because...I found out that I'm HIV. And I don't know where I get it from so that's why I was stressed. And so I was

Table 2. Summary of topics with examples of questions posed to counselors and patients in the qualitative follow-up to a smoking cessation trial for PLWH in South Africa

Counselors	Patients
1. Patient smoking background When participants first enrolled in the study and set quit data, what were their reasons for wanting to quit?	Can you tell me a bit about how you came to the decision to try and quit smoking?
2. Quitting and relapse What are some of the challenges participants faced while trying to quit smoking?	What difficulties did you face while trying to stop smoking?
3. Trial interventions <i>Counseling</i> What is working well and what can be improved? <i>Nicotine Replacement Therapy</i> How did patients feel about nicotine replacement therapy?	What improvements would you suggest to counseling? How did you feel about the nicotine patches/gum? (Probe on likes and dislikes)
4. Future smoking cessation programs What would you suggest for future smoking cessation programs?	What would be most helpful for you right now to stop smoking or to stay away from cigarettes?

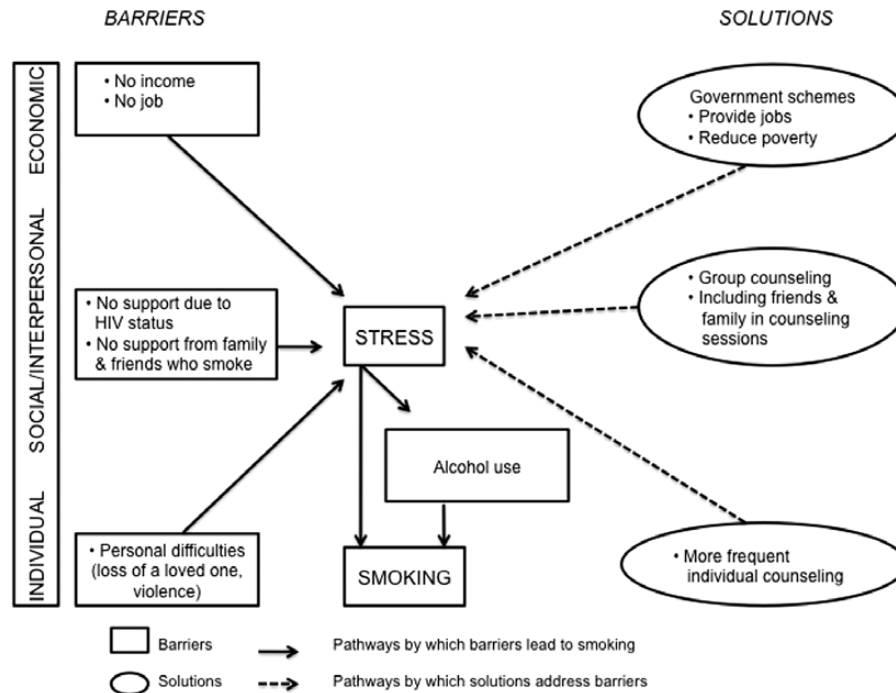


Figure 1. Conceptual framework illustrating barriers and solutions to smoking cessation through their effect on stress for people living with HIV in South Africa.

getting sick, losing weight, people were starting to talk, some of them yelling at me. That's how I get stressed (Female, 32 years).

All counselors also noted the negative influence of peers, challenges of living with smokers, and the lack of support due to non-disclosure of HIV status to family members as barriers to smoking cessation:

The other thing was that because after 6 months – and so the study was already known that we are taking HIV positive participants. So, they don't want to tell their loved ones if they didn't divulge their HIV status to them so it was difficult. So from the support point of view, it was less than expected (Counselor).

Individual Level

For three patients, stress brought on by traumatic events such as violence or loss of a loved one caused them to relapse after quitting smoking for a period of time (Figure 1). A female participant reported relapsing after being shot by her partner.

Most patients (16 out of 23) acknowledged that they smoked more when using alcohol, which they used to deal with stress (Figure 1):

Yes. Like I said, sometimes for me to drink is because of sometimes when you are having some problems, you feel like if I can go to drink, you forget about problems, then after that more again, same thing happen. (Male, 38 years).

For all patients, managing strong cravings was another barrier. Patients who quit smoking reported reducing their alcohol intake. They found eating sweets and snacks or using NRT helpful to mitigate cravings.

Four counselors also said that alcohol use and smoking went hand in hand and alcohol was used as an outlet to cope with stress:

Facilitator: So do they try cutting down drinking or quitting drinking at all?

Counselor: We will tell them. They will tell you, you know what, I'm under a lot of stress, I'm not working, that kind of things.

All counselors reported that some participants replaced cigarettes with marijuana. Similar to what patients reported, one counselor also noted that patients experienced difficulties dealing with cravings and that stress from major life events was a cause of relapse (Figure 1):

And then some of the reasons, it's the stress. Maybe a loved one being sick or having a death in the family and stuff, so those are most of the reason that they could give that I started smoking after, because there was this other patient participant who said after a child got raped or something and got raped, he started smoking again and then he couldn't stop ever after that. But the first time, he stopped within a week (Counselor).

Feedback About Smoking Cessation Interventions Counseling

All patients felt that counseling provided a supportive, non-judgmental environment that enabled them to articulate their problems. Counselors helped them develop coping mechanisms to deal with stressors. As one patient said:

They asked me different kinds of thing. Did we ever have a frustration? How do you feel at night? How do you feel this and this, you see? So I started becoming open to myself and open to the people that I'm near with them (Male, 39 years).

Five of the 13 patients from the counseling arm felt that while aspects of counseling were useful, it did not help them adequately deal with cravings.

All counselors strongly agreed with this view, stating that in a context where individuals had low literacy, faced heightened stress, and encountered numerous triggers in their daily lives, counseling alone was insufficient:

Based on my experience, I think all of them they must be put under one arm, which is nicotine replacement patch and gums. The counseling, it will depend on the education – I mean the literacy of the participants. Because some of them, they felt like the things that we are telling them, they are not applicable to their lifestyle at the moment. Like they have to take a carrot and cut it in to small pieces as a cigarette and try and make it. To them, it was like a waste of time. You are telling them to be a child – you are bringing them to their childhood and stuff, so based on my experience, I think counseling – aside the money, all of them want nicotine patches (Counselor).

Nicotine Replacement Therapy

Most patients (9 of 10) from the NRT arm of the study found nicotine patches and gum helpful to deal with cravings, particularly in the presence of triggers. It helped them “focus” and “forget cigarettes.” An additional benefit was that when patients took out the patches or gums to use, their friends became curious and wanted to know more about how to quit smoking.

One patient in the counseling arm purchased NRT on her own after hearing about it on the radio, while four others felt it would have helped them quit. A 42-year-old male patient in the counseling arm said:

Counseling helped me but sometimes I felt like having patches and chewing gums. Because with counseling we just talk, there is no one to help when you crave nicotine, there is nothing to use.

However, three of the 10 patients from the NRT arm did not follow the treatment regimen as instructed. For one patient, fear of running out of their NRT supply led to rationing:

Facilitator: Why did you not use the patches the next time?
Participant: Cause there were maybe 15 in that box and I was left with maybe 8. And I thought maybe what will happen if that 8 is finished (Male, 29 years).

Another reason cited by two patients for non-adherence was side effects. They disliked the taste of the nicotine gum and complained of constipation and increased appetite. With the nicotine patches, the other side effects reported were itching and skin irritation. Four other patients also complained of side effects but adhered to treatment.

One counselor felt that part of the effect of NRT was psychological because of patients’ perceptions that receiving a pill or medicine would help them quit:

Yeah, they want something that they can use. Whether it is working for them or not, if they can use something, they will quit. If you give them a 2-liter of just tap water and say you must drink this water until you – they will do that. They just want something.

For the future, all counselors recommended using a placebo or offering NRT to all smokers. They also felt that NRT should be provided until the patient felt confident about quitting, and not halted at 10 weeks as was done in the trial.

Other Interventions

When asked about other interventions that they would like to receive, many patients (13 of 23) felt that group counseling would enable them to support each other and share coping mechanisms to deal with stress:

Like myself, if I have problems I deal with them alone. I don’t tell anyone. Maybe those support groups it will help someone to be open and not to stress, yeah (Male, 29 years).

They wanted these sessions to include HIV-negative smokers to enable serodiscordant friends to quit together. Three patients felt that the national smoking help line or text messages could fill the gap between counseling visits to provide assistance in dealing with stressful situations but expressed concerns over the cost of these services.

All counselors also felt that group counseling would provide patients with the opportunity to share experiences and learn from each other.

Figure 1 depicts a conceptual framework of barriers to smoking cessation related to stress, and potential solutions that emerged from the qualitative data collected from counselors and patients. At the economic level, counselors and patients cited addressing unemployment as an important solution to reduce smoking induced by financial stress. To improve social support, counselors and patients suggested group counseling and including friends and family in counseling sessions so that they could better understand the challenges that the patient was experiencing. To address the lack of support due to HIV status, counselors and patients recommended expanding these interventions to include smokers without HIV, which would preclude the need for patients with HIV to disclose their status to family members and friends. At the individual level, counselors and patients suggested shorter intervals and more frequent contact between follow-up visits in order to deal with challenges quickly and prevent relapse:

The other thing that might also help – the time frames in between the visits. After 3 months, we’ll see them after another 3 months, which is in between they felt like they are lost, they don’t have anyone to talk to. Maybe after the 3 months, we can see them at least once in a month and stuff so that will give them motivation or a reminder that they must – they’re still on the right track (Counselor).

Discussion

To our knowledge, this is the first qualitative study to look at barriers to smoking cessation for PLWH in South Africa. Post-trial qualitative studies are not commonly conducted but can provide important insight into trial results and inform future interventions.¹⁷ Our findings show that barriers to smoking cessation were present at the economic, social/interpersonal, and individual levels. Many of these barriers induced stress, which hindered smoking cessation. Cumulative stress is associated with an increased risk for addictive behaviors such as smoking,¹⁸ and multiple adverse social conditions such as daily stress, discrimination, and low social support tend to cluster in PLWH.¹⁹

Smoking in response to stressors such as financial troubles mirror findings from studies in PLWH in developed countries,⁸ and this was cited as a barrier by our participants. In the Matlosana municipality, the overall unemployment rate is 32.7%, and the youth unemployment rate is 43.1%.¹⁵ Furthermore, 15.9% of the population does

not have any source of regular income.¹⁵ Therefore, the high unemployment rate in this region needs to be addressed for future smoking cessation interventions to be effective.

Social support is important in helping PLWH manage stressors,²⁰ but many participants in our study had poor social support either because their family members and peers were smokers or because getting support would require them to disclose their HIV status. For a social behavior such as smoking, an individual's likelihood of quitting depends on smoking cessation by at least two or more of the individual's contacts.²¹ There is some evidence that programs for smoking cessation that incorporate peer support are more successful than those that do not.²² As suggested by counselors and patients, future smoking cessation programs could consider including family members and friends of patients or targeting social networks. Not limiting smoking cessation interventions to HIV-positive individuals could enable them to receive social support to quit smoking without having to disclose their HIV status to family members and friends. In a study by Robinson et al.,⁹ PLWH exhibited a strong preference for group counseling but contrary to their findings, participants in our study wanted to include HIV-negative individuals in these sessions. The group format has demonstrated efficacy in other smoking cessation trials for PLWH²³ and could be used to enhance social support in this setting.

Alcohol was used to cope with stress and is associated with higher rates of smoking.⁵ As alcohol use is highly prevalent in this setting,² future interventions should consider integrating treatment for substance use with smoking cessation services.

Participants found aspects of individual counseling useful but felt it was insufficient to help them quit smoking. This is consistent with the literature on behavioral treatments for smoking cessation in PLWH, which shows small declines in smoking that are not sustained over the long term.²⁴ Participants also found the gap between study visits too long. In the future, providing access to counselors outside of regularly scheduled visits could offer additional support during difficult periods. Another potential strategy would be to provide peer counselors who could develop a bond with the participant and provide continuous support in the community. Trials of peer counseling interventions in developed countries have shown positive effects ranging from reductions in daily smoking to higher smoking cessation rates compared to usual care.^{22,25}

Although only a few participants from the NRT arm had quit smoking at 6 months, patients from both study arms strongly favored NRT. This is in contrast to studies in western contexts where PLWH felt that adding NRT to the numerous HIV drugs they were already taking was a burden.⁹ Insufficient duration of treatment and supply of NRT and inadequate management of side effects could be possible explanations for why more participants in the NRT arm did not successfully quit. In our trial, participants were provided with patches and gums for 10 weeks. Some evidence suggests that longer duration of treatment with NRT is associated with higher rates of long-term abstinence.²⁶ Providing participants with a greater quantity of NRT may encourage them to use it whenever they need without fear of running out of supply. Additionally, more frequent counseling could lead to timely management of side effects and improve treatment adherence.

A reason that many participants from both study arms were unable to quit smoking could be that the interventions in this trial were more targeted towards addressing individual level barriers to smoking cessation. For instance, counseling provided participants with coping skills to deal with stress and triggers, and NRT helped them manage cravings. The impact of these interventions could have been attenuated by barriers at the economic level such as unemployment,

and barriers at the social/interpersonal level, such as peer pressure. Participants who successfully quit smoking at 6 months used NRT and coping skills from counseling, but these were augmented by having strong social support. Thus, future smoking cessation interventions need to address barriers at these other levels in addition to providing individual-level cessation support.²⁷

A potential limitation of this study is that the IDIs conducted in Setswana and Sesotho were done by a counselor who provided counseling to participants from one clinic ($n = 9$) in the trial. This may have led to more favorable responses about counseling, but as many participants had already established rapport with the counselor, they may have been more likely to speak openly. Strengths of the study are the diverse sample, which means these findings are relevant to the larger population of HIV-infected smokers in the City of Matlosana municipality. The inclusion of patients as well as counselors also enabled us to compare and contrast their perspectives.

Conclusions

Future smoking cessation programs need to adopt a coordinated multilevel approach with interventions that simultaneously target barriers at the economic, social/interpersonal, and individual levels. Increasing the supply and duration of NRT may increase its effectiveness. Other behavioral approaches such as group counseling or peer counseling could hold promise in this setting but need to be tested for efficacy through randomized controlled trials.

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Declaration of Interests

None declared.

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