Validation of Self-Evaluation Measures in a Sample of Adults Living with HIV/AIDS in Kenya

by

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To my grandmother, Florence, I am so grateful to share your profession as well as your name.

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Abstract

Introduction. Smoking rates have increased in developing countries, such as Kenya, due to geopolitical factors related to the tobacco industry. As a result, clinicians are increasing their efforts to provide smoking cessation interventions. The present study is a secondary analysis of data from a parent study examining the effectiveness of bupropion among people living with HIV/AIDS (PLWHA) in Kenya. The aims of the study were to analyze the psychometrics of three self-evaluation measures pertaining to smoking (Self-Efficacy/Temptation Scale, Smoker and Abstainer Self-Concept Questionnaire, and a version of the Drinking-Related Locus of Control Scale adapted for smoking) in a sample of PLWHA in Kenya. This study also sought to compare the data from the sample of PLWHA in Kenya to data from a sample of PLWHA in the United States. Finally, this study examined self-evaluations pertaining to smoking in the context of qualitative data taken from focus groups from the parent study.

Methods. Participants were 50 PLWHA who smoke cigarettes recruited from HIV care clinics and methadone clinics in Nairobi, Kenya (68% male, 96% African). Participants completed measures of self-efficacy (adaptation of the Self-Efficacy Questionnaire, SE), self-concept (Smoker and Abstainer Self-Concept Questionnaire, SC), and locus of control (adaptation of the Drinking-Related Locus of Control Scale, LOC). Factor loadings were determined using Horn's parallel analysis and factor analysis, and reliability coefficients were calculated. Additionally, results from demographics and self-evaluation measures from the sample in Kenya were compared with a sample from the Bronx, New York, who completed the same measures, using chi-square tests and t-tests. Finally, qualitative data was drawn from three focus groups using a different subset of participants in the parent study in Kenya (total N = 24), which were transcribed and coders examined themes that arose in the focus groups, including HIV, tobacco

use, addiction, mental health, and social/interpersonal problems. Coded transcripts were inputted into NVivo and queries were run to examine frequency of themes and interrater reliability.

Results. The internal consistency reliability for the self-efficacy ($\alpha=0.85$) and locus of control ($\alpha=0.85$) measures were high and were lower for the self-concept measure (overall $\alpha=0.43$, smoker SC $\alpha=0.78$, abstainer SC $\alpha=0.57$). The self-efficacy questionnaire was found to have a three-factor solution accounting for 51.2% of the overall variance similar to the three factors found in previous research. The self-concept measure was found to have a three-factor solution accounting for 65.49% of the overall variance which includes an overall smoker self-concept factor and two abstainer self-concept factors. The locus of control questionnaire was found to have an eight-factor solution accounting for 69.75% of the overall variance, which differed from the three-factor solution found in previous research. Compared with PLWHA in the Bronx, the PLWHA in Kenya had a higher total mean score for self-efficacy ($p = 0.07$), higher levels of identification as abstainers, higher levels of external locus of control and fate/chance, and lower levels of internal locus of control. Qualitative data analysis showed that participants with PLWHA in Kenya had high motivation to quit smoking but were frustrated in their difficulty quitting, citing challenges with addiction and cravings.

Conclusions. Together, the results showed that while the psychometrics of the self-efficacy and self-concept scales for the Kenya sample of PLWHA had similar findings to previous analyses that took place in developed countries, the locus of control measure had very different results, highlighting the importance of examining cultural experiences as part of analyzing psychometrics for self-report measures. Understanding how people view smoking while taking into account cultural and individual differences may help clinicians develop smoking cessation interventions for PLWHA that target these views and self-evaluations.

Keywords: smoking, smoking cessation, HIV/AIDS, self-efficacy, self-concept, locus of control

CHAPTER I

Tobacco use, especially cigarette smoking, is a worldwide concern that has many

outcomes for health, including increased risks for multiple types of cancers; stroke; heart and

vascular diseases including aortic aneurysm, coronary heart disease, and atherosclerotic

peripheral vascular disease; respiratory diseases including chronic obstructive pulmonary disease

(COPD), asthma, pneumonia, and tuberculosis; and overall diminished immune function (U.S.

Department of Health and Human Services, 2014). In the United States, 13.7% of the adult

population smoke cigarettes (Creamer et al., 2019): every day, more than 257,000 children under

the age of fourteen (1.34% of boys and 1.17% of girls) and 34,071,000 people over the age of

fifteen (14.4% male, 11.7% female) use tobacco daily (Drupe et al., 2018). Additionally,

smoking is the leading preventable cause of death in the United States, and one out of every five

deaths can be attributed to smoking or exposure to secondhand smoke (U.S. Department of

Health and Human Services, 2014): 19.27% of men and 16.21% of women die because of

tobacco-related reasons (Drupe et al., 2018).

Smoking is not just a problem in the United States, but it is also a significant problem in

other places around the world, such as Kenya. The Republic of Kenya is located on the eastern

border of Africa. With a wide range of climates (ranging from desert in the northern half to

tropical and temperate areas in the southern half, and even several areas with mountains topped

with snow), the populations and cultures in the region can vary significantly. Kenya's population

size is nearly 55 million as of 2021, with nearly 11 million located in the Nairobi metro area (The

World Bank, 2021). Kenya has had a turbulent history – while its first occupants were Cushites,

Bantu groups, and nearly forty other tribes with a variety of linguistic and cultural origins, the

area was initially colonized by the Portuguese in 1505, then taken over by the Omani in 1730,

and then under British rule from 1895-1963, when Kenya declared its independence following the Mau-Mau uprising in 1953 (Pouwels & Kusimba, 2000, pg. 30-31). As a result of this history, the nation known as Kenya today is "a colonial invention" that does not truly represent the rich histories and cultures of the people, which remain a central conflict in the identity of the area, even after independence (Hornsby, 2013, pg. 1-2). In Kenya, as of 2014, approximately 11.6% of the adult population smoke cigarettes (Ministry of Health, Kenya, 2014): more than 18,000 children under the age of fourteen (0.51% of boys and 0.15% of girls) and 2,116,00 people over the age of fifteen (14.9% male, 1% female) use tobacco daily (Drupe et al., 2018).

Tobacco use is a worldwide epidemic that poses a global health concern due to its links to many negative health outcomes. However, while Western Europe's cigarette use declined by 26% between 1990 and 2009, cigarette use in Africa, South Asian countries, and some Middle Eastern countries increased by 57%, suggesting a significant shift from developed countries to developing countries[1] (Braithwaite et al., 2014). Tang et al (2018) found that while the smoking prevalence in Kenya decreased from 22.9% in 2003 to 17% in 2014, the smoking prevalence is still high considering Kenya's high implementation rate (78%) of the World Health Organization's Framework Convention of Tobacco Control (WHO-FCTC) (Tang et al, 2018, Husain et al., 2016).

One of the biggest reasons for these changes in smoking trends is the fact that the tobacco industry has shifted its focus from developed countries to developing countries, both in terms of tobacco production and consumption. As the dangers of smoking became known, countries began implementing legislation to reduce the harmful effects of smoking, such as health

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[1] The term "developing countries" is used to describe countries with less developed industrial bases and low Human Development Index scores (HDI) relative to other countries; however, neither the World Bank nor the International Monetary Fund have formal definitions for the term "developing countries." (O'Sullivan & Sheffrin, 2003).

warnings on packaging, smoking bans in public places, and limitations on the sale of tobacco products. Tobacco companies fought back by lobbying against these bills. Additionally, individuals, organizations, and even countries such as the United States, Canada, the United Kingdom, Australia, and other members of the European Union started litigating against major tobacco companies such as Philip Morris International and British American Tobacco to hold them responsible for the health problems developing as a result of smoking – the most successful lawsuits were based in tobacco companies using misleading advertising, advertising to children, and not reporting health effects of smoking in advertising (tobaccocontrollaws.org, 2021). Some of the lawsuits did uphold legislation that led to significant changes, including package labeling, smoking bans, limiting sale of tobacco products, and even stopping tobacco production.

Because developed countries were becoming more successful at restricting tobacco production and consumption in their countries, tobacco companies shifted their focus and found a new market in developing countries, which welcomed the income provided by tobacco production and had fewer resources available to fight against tobacco companies regarding health concerns. The targeting of developing nations by tobacco companies has had devasting consequences with regard to cigarette use and consequences. The WHO estimated that 40 million people will die due to tobacco by 2030 in developed countries; however, that number is estimated to be 135 million in developing countries (Mathers & Loncar, 2006). Also, compared to developed countries, where the number of Disability-Adjusted Life Years due to tobacco exposure has decreased by 12% in countries with high sociodemographic indexes, that number has increased in countries with low sociodemographic indexes (GBD 2016 Risk Factors Collaborators, 2017). Additionally, secondhand smoke is a significant risk to people who do not smoke – 60% of child deaths due to secondhand smoke occur in Africa and East Asia (Öberg et

al. 2010). Finally, the expenditure for tobacco often is taken away from food – for example, in Bangladesh, the money an average poor person spends on tobacco could add over 500 calories to a family member's diet per day (Efroymson et al., 2001).

In addition to health consequences, developing countries also face many economic consequences relating to tobacco, both as consumers of tobacco and as contributors to the tobacco industry. As consumers of tobacco, people who smoke in developing countries will contribute to the cycle of poverty they are trapped in. Because tobacco is often a significant expense, people who smoke tobacco in developing countries are more likely to be pushed into poverty in order to accommodate the expense of smoking (Action on Smoking and Health, 2019). Additionally, because nicotine is addictive, people who smoke continue to spend on tobacco, which keeps families trapped in poverty just because of the amount of money spent. Finally, families will have tradeoffs – money that is spent on tobacco is usually taken from education, healthcare, and other basic needs that are likely to push families out of poverty (Action on Smoking and Health, 2019). People who contribute to the tobacco industry also face significant economic consequences because of the tobacco farming industry.

Tobacco farming is a complicated issue in developing countries, because while governments know that tobacco is harmful for people and the environment, farming tobacco also supposedly tackles an immediate concern – alleviating poverty (Hu & Lee, 2015). African governments and tobacco companies convey to individual farmers that growing tobacco will provide money for farmers to not only pay back the startup costs of developing a farm but will also keep farmers employed and earning a steady stream of income – they are "active in promoting positive aspects of tobacco farming and in 'protecting' farmers from what they portray as unfair tobacco control regulations that reduce demand" (Hu & Lee, 2015, pg. 41). These

messages are extremely successful, because while people are eager to farm tobacco, tobacco farming often leaves individual farmers at the mercy of middlemen and tobacco companies who set the price to buy tobacco from the farmers, and as a result, individual tobacco farmers remain "trapped in a vicious cycle of poverty and indebtedness" (Hu & Lee, 2015, pg. 44).

In order to mitigate the health and economic consequences of smoking in developing countries, the World Bank suggests reducing tobacco consumption, because people will (1) stop smoking and will develop fewer health conditions, and (2) people will stop spending money on tobacco products, which means there will be less demand for tobacco to be produced, and money spent on tobacco products could be re-invested in education and healthcare (The World Bank, 2003). In 2008, the WHO also launched their own global framework in response to the tobacco epidemic (WHO-FCTC) which includes MPOWER, a policy package with six evidence-based components for reducing the demand for tobacco worldwide. Some of the MPOWER measures include education on health risks of tobacco such as health warnings on packaging and labeling of tobacco products; bans on tobacco advertising, promotion, and sponsorship; measures against secondhand smoke exposure; increases in tobacco prices and taxes on tobacco products; and offering cessation resources for people who smoke (Tumwine, 2011).

There is a wide range of implementation of these measures in African countries, however: Kenya had the highest average implementation rate of the WHO-FCTC's MPOWER measures, at 78%, while Sierra Leone had the lowest average implementation at 9% (Husain et al., 2016). Additionally, among African countries, the specific regulations that had higher implementation rates compared to other MPOWER measures included protection from secondhand smoke, establishing labeling and packaging requirements, and education and public awareness of the dangers of smoking; the regulations that had the lowest rates of implementation

included developing economically viable alternatives to careers in the tobacco industry

(including tobacco farming), and provisions for criminal and civil liability (Husain et al., 2016).

Implementation of the MPOWER measures has been difficult, and tobacco companies

have lobbied against measures, including in Kenya, where, as noted above, the MPOWER

implementation rate is highest among African countries. Prior to MPOWER's introduction,

Kenya passed the Tobacco Control Act in 2007, which included provisions for smoke-free public

places, health warnings on packaging, bans on tobacco advertising and sponsorship, public

education and health campaigns, limiting sales to minors, and measures on taxing and pricing of

tobacco products (Tobacco Control Act, 2007). The Tobacco Control Act was considered weak,

however, as many of the provisions in the bill do not meet FCTC criteria, especially in regard to

smoking bans in public places (Tumwine, 2011). In response to the weaknesses in the Tobacco

Control Act, Kenya's government introduced the Tobacco Control Regulations (TCR) in 2014,

which included measures for graphic health warnings, stronger legislation for smoke-free areas,

and limitations on tobacco companies (Tobacco Tactics, 2021).

In 2015, British American Tobacco (BAT) filed a legal case against the Ministry of

Health in Kenya, claiming that the regulations were unconstitutional, which led to the High

Court in Kenya suspending implementation of the TCR until a final ruling was reached; after two

additional appeals, the Kenyan Supreme Court upheld the regulations implemented in the TCR in

November 2019 (Tobacco Tactics, 2021). In practice, however, the implementation of anti-

smoking legislation has run into a number of obstacles. According to an article from The

Guardian, people in Kenya work around the TCR requirements in several ways (Boseley, 2017).

First, there are designated "smoking huts" that serve as a loophole for the ban on smoking in

public places. Second, while there are laws requiring cigarettes to be purchased in packs, many

people buy cigarettes individually, which makes it easier for adults and children to access tobacco products. Third, while Kenya has official advertising bans, tobacco companies, including BAT Kenya, provide support to independent vendors, including providing stalls to sell tobacco products in that are painted with "non-corporate" colors widely known to be affiliated with these companies. Finally, while the tobacco legislation exists on a national level, counties enforce these laws differently. For example, while Nairobi County works hard to enforce smoking bans in public places while public health enforcement officers are active, "cigarettes are sold and smoked openly" when the officers are off duty. Taken together, these loopholes around the national laws have given the tobacco industry a prominent place in developing countries such as Kenya, and has made addressing the tobacco epidemic much more difficult.

The United States has invested money and research into public health issues in developing countries in relation to smoking as well as in other areas (e.g., HIV). In order to address several growing pandemics in sub-Saharan Africa (including HIV/AIDS, malaria, and other tropical infectious diseases), the United States National Institute of Health (NIH), including the National Institute of Allergy and Infectious Diseases (NIAID), has invested considerable amounts of money to advancing research for treatment and public health (NIH, 2020). Because of the consequences of the shift in tobacco industry to developing countries and because research has established a link between HIV/AIDS and smoking (Clifford et al., 2005; Crothers et al., 2009), the NIH has also started funding and conducting research on smoking in Africa, particularly among people living with HIV/AIDS (PLWHA).

Most of the research on smoking among PLWHA has been conducted in developed countries, such as the United States. It is important, however, to study smoking among PLWHA in developing countries, such as Kenya, because there are differences in access to care and

cultural beliefs, including self-evaluations, that may alter the effectiveness of interventions. This study will examine cigarette smoking among PLWHA in Kenya, with a focus on how self-evaluations, including self-efficacy, self-concept, and locus of control, may contribute to smoking cognitions.

HIV/AIDS in the United States and Kenya

HIV/AIDS is a virus that attacks the body's immune system and is a significant health concern in the United States and around the world. According to the CDC, over 1.1 million people in the United States were estimated to have HIV by the end of 2015 (CDC, 2019), but only 86% of all PLWHA in the United States (90% adult women and 85% adult men) knew they had the disease (UNAIDS, 2020). Out of the nearly 38,000 new cases of HIV in 2017, 69% were contracted by LGBTQ individuals and men having sex with men, 24% were contracted by heterosexual individuals and 7% of new cases were due to injecting drugs (CDC, 2020). In 2018, out of the population of PLWHA in the United States who knew their HIV status, 65% received care for their HIV and 56% were virally suppressed (CDC 2019).

As of 2019, out of 28.9 million adults in Kenya, 1.4 million are living with HIV; however, there is insufficient data to clarify its prevalence in specific populations, such as sex workers, men who have sex with men, people who inject drugs, transgender individuals, and prisoners (UNAIDS, 2020). Out of the entire population of PLWHA in Kenya, 90% know their HIV status, 16% know their status but are not receiving treatment, 6% are being treated and are not virally suppressed, and 68% are being treated and are virally suppressed (UNAIDS, 2020).

Smoking Among PLWHA

PLWHA are especially vulnerable in regard to cigarette smoking, both because of increased prevalence of smoking compared to the general population and because of health

reasons. In terms of increased prevalence of smoking among PLWHA, in the United States, 59% of PLWHA report currently smoking cigarettes compared to 14% of the total US population (Tesoriero et al., 2010). In Kenya, the prevalence of PLWHA who smoke cigarettes remains unclear – data collected from several clinics in Nairobi estimate between 16% to 100% of PLWHA smoke (Scott, 2018, "Optimizing Smoking Cessation Interventions for People Living with Human Immunodeficiency Virus (PLWH) In Nairobi, Kenya" (KNH-UON ERC Number P901/12/2018)).

In terms of health consequences, for PLWHA, the risk for many of comorbidities of both smoking and HIV are amplified by smoking, although the mechanisms as to why this is so are still unclear (Clifford et al., 2005; Crothers et al., 2009). Smokers with HIV have a significantly higher mortality rate (5.48 per 1000) than non-smokers with HIV (2.45 per 1000) (Crothers et al., 2009). In both the unadjusted analyses and analyses adjusted by HIV status, age, race, ethnicity, hepatitis infection, injection drug use, and hazardous alcohol use, there were significant relationships between smoking and higher mortality rates, greater number of comorbid diseases and respiratory symptoms, and lower quality of life (Crothers et al., 2009). Helleberg et al. (2012) showed that PLWHA who smoke, compared to never-smokers, had significantly higher mortality rates (23.7 and 6.1 respectively), and for those who had HIV, the cause of death being related to smoking was increased. Additionally, the average lifespan of PLWHA who currently or previously smoked (62.6 and 69.1 years, respectively) was significantly lower than PLWHA who never smoked (78.4 years). Finally, the mortality rates of PLWHA due to AIDS-related causes was significantly higher among current and previous smokers (5.2 and 6.0, respectively), compared with never-smokers (1.4). Taken together, this data suggests that smoking is related to increased rates of both AIDS-related and non-AIDS-related deaths among PLWHA.

Like other adults who smoke cigarettes, many PLWHA want to quit smoking cigarettes (Creamer et al., 2018). Mamary et al. (2002) found that 72% (81% of men, 40% of women) of the sample of PLWHA at an outpatient HIV clinic had tried to stop smoking at a previous time and 63% were currently thinking about quitting. Additionally, of the participants who expressed interest in quitting, 69% were interested in a group smoking cessation program, 82% were interested in nicotine replacement therapy, and 56% were interested in both treatments. This data was corroborated by Tesoriero et al. (2010), where about 75% of their sample of PLWHA reported an interest in quitting, and while 80% indicated that a health professional advised them to stop smoking, only 41.2% reported that they were recommended or prescribed a cessation treatment.

These results were significant because the majority of smokers with HIV wanted to quit, similar to the general population of adults who smoke. The similarity suggests a high level of motivation to quit smoking, and the interest in combining treatment options increases the odds of cessation (Fiore et al., 2008). People who are motivated to quit smoking may benefit from interventions that address psychosocial factors that people feel they can control. Self-evaluations, such as self-efficacy, self-concept, and locus of control, may be useful factors that can be addressed during interventions to help with the cognitive and behavioral aspects of smoking cessation – therefore, more research on these factors is important to examine the effectiveness of incorporating them into interventions.

Self-Efficacy

Self-efficacy is defined by Albert Bandura as "judgments of how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982, p. 122). Bandura explains that in order to accomplish anything, a person requires more than just the knowledge to

accomplish the task; a person requires the ability to break down the task into component actions, and the ability to complete the actions. Another critical aspect of accomplishment is self-efficacy, which includes judgments of the person's own abilities to complete the task successfully either independently or with help (Bandura, 1982).

Self-efficacy is a part of a framework a person's self-appraisal and can influence behavioral outcomes (Bandura, 1982). There is a correlation between increased perceptions of self-efficacy and increased levels of performance in a range of behaviors (Bandura, Reese & Adams, 1982). Additionally, intervention studies show that increases in self-efficacy correlate with progression in exposure therapy for specific phobias (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977) and lower levels of distress (Bandura, Adams, Hardy, & Howells, 1980).

Bandura (1982) proposes four factors that contribute to a person's ability to judge their self-efficacy. First, enactive attainments are significant factors in that a person can use their previous accomplishments to determine whether the task in question will also be successful. If someone has experienced a number of recent successes, the person is likely to have a higher perception of self-efficacy; conversely, if a person has had a number of recent failures, the person is likely to believe they will not succeed at the current endeavor. Second, through vicarious experience, a person will see another person attempt to complete a task and will be able to use information from the attempt to compare themselves to the other person. Therefore, the person can use the other person as a reference point both in terms of their own abilities compared to the other's abilities and mastery, and as a reference in terms of the circumstances around the task (i.e., whether the circumstances are comparable or not may also adjust someone's expectations). Third, through verbal persuasion (or social persuasion), a person will get direct cues from someone else encouraging or discouraging the person's self-efficacy, which can affect

how a person sees themselves. In most cases, this appears as discouragement lowering someone's perception of their self-efficacy, and therefore making it less likely a person will succeed. Finally, physiological factors can influence a person's perception of self-efficacy. For example, physical manifestations of stress are likely to lower a person's perception of self-efficacy.

Self-efficacy is often a critical component related to health behaviors and is conceptualized in a number of ways in health settings. As part of Bandura's Social Cognitive Theory, which posits that learning comes from cognitive, behavioral, and environmental factors, self-efficacy is an important cognitive factor that allows for individuals to make choices promoting positive health behaviors and avoiding negative ones, and receiving reinforcement when such actions have a positive effect (Bandura, 1977a; Bandura, 1977b; Anderson et al., 2007; Sheeshka et al., 1993). As part of the Health Belief Model, self-efficacy is one of the six concepts important to engaging in positive behaviors and avoiding negative behaviors, and is an important part of planning and taking action to change behavior (Rosenstock, Strecher & Becker, 1988). Moreover, as part of the Theory of Planned Behavior, self-efficacy is related to perceived behavioral control, which helps individuals choose to engage in behaviors based on evaluations of subjective and social norms (Ajzen, 1991).

Overall, it is important to understand the role of self-efficacy as it pertains to behavioral change, because it is an important part of an individual's decision to pursue health changes such as behaviors related to cigarette smoking – if an individual has high levels of perceived self-efficacy, there is a greater chance that the person will choose to engage in behavioral change and have a more positive outcome.

Self-Efficacy and Smoking

Self-efficacy has been widely studied in relation to smoking cessation. It is often studied as the self-efficacy to resist temptation (as temptation could lead to smoking relapse after cessation), and as a result, many scales focus on measuring temptation. One example is Velicer's self-efficacy questionnaire, a 20-item survey using a Likert scale where higher scores indicate greater levels of temptation and lower levels of self-efficacy (Velicer, 1990). The questionnaire is divided into three subscales: positive/social (alpha = 0.86), negative/affective (alpha = 0.95), and habit/addictive (alpha = 0.80) subscales measuring levels of temptation due to positive or social situations, negative affect, and habit/addiction, respectively (Velicer et al., 1990). Higher levels of self-efficacy have been shown to have a significant relationship with increased smoking cessation success (DiClemente, 1981; McIntyre, Lichtenstein, & Mermelstein, 1983; Baer, Holt & Lichtenstein, 1986; Stuart, Borland, & McMurray, 1994). Conversely, lower levels of self-efficacy are related to a significantly higher rate of relapse or difficulty quitting smoking (DiClemente et al., 1985; Carey and Carey, 1993; Shiffman et al., 2000).

In their meta-analysis, Gwaltney et al. (2009) analyzed fifty-four prospective studies that examined self-efficacy's relationship to quitting smoking. In the eighty-seven analyses of pre-quit assessment of self-efficacy, higher levels of self-efficacy at baseline, compared to lower levels of self-efficacy, were associated with greater odds of abstinence from smoking at the end of the studies, although it should be noted that the effect size was small ($d_+ = -0.21$, SE = 0.04, 95% CI = -0.28 through -0.14). This effect size was larger when quantity of smoking was not controlled for ($d_+ = 0.26$, SE = 0.04, 95% CI = -0.35 through -0.18).

Research has also shown that self-efficacy can have a relationship with cognitive aspects related to smoking outcomes, such as motivation to quit smoking. Kelly et al. (1991) found that

higher levels of self-efficacy were able to predict higher levels of motivation to quit smoking ($p < 0.05$). Castro et al. (2014) found that self-efficacy was positively correlated with motivation to quit smoking both at baseline ($r = 0.19$, $p < 0.001$) and on the quit date ($r = 0.38$, $p < 0.001$). Nordgren et al. (2008) found that self-efficacy was a mediating variable between level of cigarette craving and intention to quit smoking in adults who smoked, showing that when participants were not craving cigarettes at the time the questionnaires were administered, they reported higher levels of self-efficacy and motivation to quit smoking. De Vries et al. (1998) also found that adult smokers in action phases of quitting smoking (i.e., actively engaged in behaviors to quit smoking) had higher levels of self-efficacy than adult smokers in precontemplation and contemplation phases of quitting (i.e., not actively quitting smoking).

There is also limited research on the relationship between self-efficacy and other cognitive-related smoking outcomes. Martinez et al. (2010) found that greater perceived control over abstinence-induced symptoms was correlated with greater self-efficacy ($\beta = 0.15$, $t = 3.46$, 95% CI $= 0.11$-0.40, $p = 0.001$). Grembowski et al. (1993) found that among older adults who smoked, there was a significant correlation between self-efficacy expectations (how participants felt about their ability to carry out an intervention) and outcome expectations (participants' perception of harm of the health behavior) ($r = 0.51$, $p < 0.05$), suggesting that those with increased self-efficacy in quitting were more likely to see the harm in smoking.

Taken together, the literature suggests that there is a significant relationship between higher levels of self-efficacy and increased success in smoking cessation. From a cognitive-behavioral perspective, this relationship is not surprising because higher levels of self-efficacy may reinforce a person's confidence and commitment to quitting, which leads to early success in

the quit attempt. Moreover, early success when quitting smoking can lead to an increased sense of mastery, which reinforces self-efficacy and makes maintaining abstinence easier.

Self-Efficacy and HIV

Self-efficacy is an important tool for understanding health outcomes among many groups including HIV. Many studies conducted on self-efficacy in relation to HIV/AIDS examine self-efficacy regarding medication adherence, behaviors that could lead to transmission of HIV, or coping with an HIV diagnosis (e.g., (e.g., Barclay et al., 2007); Wolf et al., 2007). There are, however, several studies that examined smoking-related self-efficacy in PLWHA.

While the above studies have examined general self-efficacy related to HIV, with regard to studies that have examined self-efficacy related to smoking and cigarette use in samples of PLWHA, Shuter et al. (2014) found in a sample of PLWHA who smoke that lower levels of self-efficacy were correlated with younger age ($\rho = -0.102$, $p = 0.09$), and higher levels of nicotine dependence ($\rho = 0.412$, $p < 0.001$), cigarettes per day ($\rho = 0.313$, $p < 0.001$) and exhaled CO_2 level ($\rho = 0.135$, $p = 0.03$), loneliness ($\rho = 0.289$, $p < 0.001$), depression ($\rho = 0.208$, $p = 0.001$), and anxiety ($\rho = 0.277$, $p < 0.001$). Additionally, in a sample of adult PLWHA in the United States, Vidrine et al. (2005) found that participants who were randomized to a cell phone-based intervention were significantly more likely to have an increase in self-efficacy than their usual care counterparts ($OR = 1.42$, 95% $CI = 1.12–1.79$, $p = 0.004$), which contributed to success in smoking cessation. In a continuation of this intervention efficacy trial, Vidrine et al. (2015) also found that self-efficacy was a mediator in the relationship between the intervention and success in smoking cessation ($\beta = 1.12$, 95% $CI = 0.29\text{-}1.96$, $p < 0.01$). Similarly, Stanton et al. (2009) found that self-efficacy was a mediator in the relationship between a behavioral treatment plus

nicotine replacement therapy (NRT) intervention and smoking cessation among adult PLWHA who smoked in the United States (AOR = 1.54, 95% CI = 1.34-1.77, p < 0.001).

One previous study was identified that assessed smoking self-efficacy in PLWHA. Shuter et al. (2012) reported that among a sample of PLWHA in the Bronx, New York (n = 60; mean age = 46.8±7.2; 53.3% male, 46.7% female; 50.0% Latino/a, 36.7% Black, 3.3% White, 10.0% other), participants reported feeling temptations to smoke in a number of situations (M = 3.9, SD = 0.9; range of scores = 0-5). However, smoking-related self-efficacy measures have not been examined among PLWHA in relation to other smoking characteristics (e.g., motivation to quit smoking or perceived risks and benefits of smoking), or as part of a larger model of psychological factors contributing to smoking cessation.

Self-Concept

Self-concept is rooted in Hazel Markus's theory of self-schemata (Markus, 1977). Self-schemata develop because individuals need internal cognitive structures to process social stimulation efficiently. Markus (1977) theorizes that personality is based on the framework of self-schemata. As people process social input, they use their schemas to organize the information based on what resonates with them, usually including types of descriptors (for example, "smoker" and "abstainer"), and the processed information, when stored in long-term memory, reinforces aspects of personality the person believes to be true.

A second construct important in self-concept is "possible selves," which are "cognitive components of hopes, fears, goals and threats, and they give the specific self-relevant form, meaning, organization, and direction to these dynamics" (Markus & Nurius, 1986, p. 954). Possible selves can be the manifestations of what a person wishes for their ideal self (in the case

of smoking, for example, a person could feel that their ideal self is not a smoker), and as a result, possible selves can serve as motivation or incentive for a person to change their behavior.

Examining self-concept in relation to behavior, including health behavior, is important because the way a person views himself or herself is plays a role in the person's behavior. Therefore, challenging schemas, a core component of cognitive behavioral therapy, is likely to change the way a person sees himself or herself, and these changes may then be seen in changes in behavior. Additionally, examining the "possible self" can be useful in assessing the ideal self and a person's motivation for change to become more closely aligned with that ideal self.

Self-Concept and Smoking

Shadel and Mermelstein (1996) developed a working theory on smoking-related self-concept based on the self-concept ideas described by Markus et al. (1977 and 1986) in the previous section. In this theory, aspects of self-concept relating to smoking can be examined based on two types of identification – "smoker" and "abstainer," depending on how a person relates their self-schema to the identity of a "smoker" or the identity of an "abstainer" based on smoking history and habits, as well as self-identification. It is important to recognize that the smoker self-concept and abstainer self-concept are different, unique self-concepts and both should be evaluated as part of overall smoking-related self-concept. For current smokers, the smoker schema is more likely to reflect the present self, while the abstainer schema is more likely to represent a possible future self that could be used as motivation for change (Shadel, Mermelstein & Borrelli, 1996). The fact that these two identifications contrast is important because the interaction of these two views of the self may each have an impact on smoking behaviors.

Two self-concept scales developed as a result of this theory, the Smoker Self-Concept Scale and the Abstainer Self-Concept Scale, and these two scales are used together to understand how smokers identify as a smoker and as an abstainer (Shadel & Mermelstein, 1996). A sample of 199 individuals participating in a smoking cessation program completed the two self-concept questionnaires, as well as measures examining self-efficacy, motivation to quit, nicotine dependence, and smoking status (Shadel & Mermelstein, 1996). Factor analysis showed that the smoker self-concept and abstainer self-concept were two distinct factors, with alphas of the subscales were 0.74 and 0.77, respectively. The authors found that the interaction of smoker self-concept and abstainer self-concept had a significant relationship in predicting smoking status after three months – that is, participants who reported high levels of abstainer self-concept and low levels of smoker self-concept were most likely to be abstinent at three months. Smoker and abstainer self-concepts may also be fluid depending on the individual's current smoking status: as research shows, participants who quit smoking during an intervention were more likely to report higher levels of abstainer self-concept and lower levels of smoker self-concept than the participants who continued smoking (Shadel, Mermelstein & Borrelli, 1996).

Most of the research on smoking and self-concept has focused on adolescent samples, both because identity formation is a developmental milestone in adolescence, and because many adults who smoke began smoking in adolescence. As teenagers are focused on comparing themselves to their peers, smoking becomes part of that cognitive appraisal of the self. Chassin et al.'s 1981 study best exemplifies this idea in their examination of how adolescents compared themselves to various stereotypes and descriptors of smokers and non-smokers. The adolescent participants considered the stereotypes of the boy and girl who smoke very similarly: both were considered somewhat "unhealthy, bad, nervous foolish, disobedient, not so good at schoolwork,

acting big, liking to be with a group, drinking, and interested in the opposite sex" and boys were additionally considered "somewhat tough and slightly ugly" (pg. 672). Although the participants' gender did not significantly impact ratings of these targets, adolescents who smoked were more likely to rate the smokers more positively than the adolescents who did not smoke ($p < 0.001$).

Additionally, the results of Snow and Bruce's 2003 study showed that out of the four assessed domains of self-concept (family, peer, physical, and social), three of the domains had significant negative relationships with the smoking status of the adolescent participants (family self-concept $p < 0.001$, physical self-concept $p < 0.01$, social self-concept $p < 0.01$). Participants who smoked cognitively appraised themselves more negatively in those three domains, while self-concept among peers does not differ significantly based on smoking status. These findings are consistent with Thornton et al.'s 1999 study finding that the lower scores in same three self-concept domains (i.e., family, physical, and social) were related to greater odds of smoking. The findings are also consistent with Emler's (1984) Reputation Enhancement Theory (RET), which posits that adolescent behavior is motivated by the need to manage self-presentation and reputation to their peers. Because adolescents are motivated to manage their reputations in front of peers, they are not likely to evaluate themselves negatively if they are part of in an environment where smoking is not seen as negative.

These cognitive appraisals of smoking in adolescence have effects on smoking outcomes in adolescents. Falomir and Invernizzi's 1999 study showed that even after controlling for smoking attitudes and perceived control, higher levels of smoker identification were associated with higher numbers of cigarettes and longer duration of smoking ($\beta = 0.326$, R^2 change $= 0.091$, Fchange $= 17.95$, $p < 0.001$). The results additionally showed that when participants were

categorized based on level of smoking identification (strong and weak identification), compared to those in the weaker identification category, participants who reported strong identification as smokers perceived themselves as less likely to be in control ($M = 4.51$ vs. $M = 3.50$, $F(1,149) = 21.17$, $p < 0.001$), smoked more cigarettes per day ($M = 12.31$ vs. $M = 7.97$ cigarettes per day) and had smoked for longer periods of time ($M = 3.89$ vs. $M = 2.56$ years of consumption; mean for standardized measures: $M = 0.34$ vs. $M = -0.34$, $F(1,149) = 31.60$, $p < 0.001$), and expressed less intention to quit smoking ($M = 5.08$ vs. $M = 5.86$, $F(1,149) = 12.69$, $p < 0.001$). In a longitudinal study, Hertel and Mermelstein (2012) studied the relationship between smoking self-concept and the trajectories of smoking escalation behavior and found that as participants reported stronger identification as a smoker across time, they were more likely to be classified in escalating smoking trajectories (continuous $\gamma = 0.28$, $p < 0.001$; categorical $\gamma = 1.69$, $p < 0.001$).

Taken together, the research on adolescents shows that adolescents who smoke are more likely to rate smokers positively than adolescents who do not smoke, suggesting that smokers have a conscious identification with other smokers, and that the identification is not necessarily seen as a bad thing. Additionally, identifying as a smoker is related to smoking behaviors, including more smoking (both in rate and frequency of smoking) and escalating smoking behaviors over time.

While there is limited research on self-identity and adults, the research on adolescents may be applicable to other age groups. While there are certain aspects of smoking that are often viewed negatively, such as health consequences, unpleasant smell, and financial burden, there are also people who have positive smoking identities – that is, positive feelings associated with being a smoker. In Tombor et al.'s 2013 study of 43,079 adults in the United Kingdom who smoked at the time of data collection, 18.3% reported having a positive smoker identity (17.1%

of women and 19.4% of men). A positive smoker identity was positively correlated with enjoying smoking (r = 0.18, $p < 0.05$), reports of addiction (r = 0.06, $p < 0.05$), and higher levels of nicotine dependence (r = 0.09, $p < 0.05$); and negatively correlated with confidence in quitting (r = -0.07, $p < 0.05$), worry that smoking is affecting present health (r = -0.04, $p < 0.05$) and future health (r = -0.06, $p < 0.05$), worry about the effect of smoking on loved ones (r = -0.04, $p < 0.05$), the financial concerns about smoking (r = -0.03, $p < 0.05$), motivation to quit (r = -0.27, $p < 0.05$), and quit attempts (r = -0.13, $p < 0.05$). Additionally, at a six-month follow up, those with positive smoking identities, compared to those who did not have positive smoking identities, were less likely to have made a quit attempt (OR = 0.61, 95% CI (0.48-0.79), $p < 0.001$). Among those who made a quit attempt, those with positive smoking identities did not differ in quit attempt success compared to those who did not have positive smoking identities. These results suggest that associating smoking with one's identity in a positive way may have an effect on behavior lead up to an actual quit attempt, but less of an effect on whether the quit attempt is successful.

Self-Concept and HIV

There is little current research about smoking self-concept among PLWHA. Most self-concept research regarding HIV/AIDS focuses on how PLWHA view themselves in regard to their HIV/AIDS status (Waweru, Reynolds & Buckner, 2008; Asikhia & Mohangi, 2015), how PLWHA view themselves in regard to factors outside of HIV/AIDS such academic performance (Gabriel et al., 2009; Adetoro, Oyefuga & Simisaye, 2010), or how self-concept relates to risky behaviors that may lead to HIV/AIDS (Talley et al., 2014; Ferreira et al., 2014).

One previous study was identified that assessed smoking self-concept in PLWHA. Shuter et al. (2012) reported that among a sample of PLWHA in the Bronx, New York (n = 60; mean age

= 46.8 ± 7.2; 53.3% male, 46.7% female; 50.0% Latino/a, 36.7% Black, 3.3% White, 10.0% other), participants reported mean scores of self-concept as smokers ($M = 20.1$, $SD = 13.2$; range of scores = 5-50) and abstainers ($M = 27.5$, $SD = 18.0$, range of scores = 4-40) on the Smoker and Abstainer Self-Concept Questionnaire suggesting that participants identified more strongly with being abstainers than smokers. However, self-concept measures have not been analyzed in a larger context, such as in relation to other smoking-related characteristics (such as motivation to quit smoking or perceived risks and benefits of smoking), or as part of a larger model of psychological factors contributing to smoking cessation.

Taken together, the research on self-concept in regard to smoking shows several important things. First, self-concept or identification with smoking can play a significant role in part of one's identity formation, and that the stronger the identification as a smoker, the less motivated someone is to quit smoking and the more likely they will continue identifying with the smoker schema. Second, it is important to examine both the smoker and abstainer schemas because while the smoker schema likely reflects current smoking behaviors, the abstainer schema may illuminate a possible ideal self that someone may wish to strive for. Finally, it is important to note that there is limited research on smoking self-concept in PLWHA. Given that PLWHA are more likely to smoke than the general population and are especially vulnerable to certain comorbidities related to smoking, it is important to examine self-concept as part of the individual differences that may be worth utilizing during smoking cessation interventions.

Locus of Control

Locus of control, a theory developed by Julian Rotter, is based on how people see their relationship to events or outcomes (Rotter, 1954). Social learning theory posits that people learn through emulation, and locus of control takes this information and applies it to the self (Bandura,

1977b). In the case of cigarette smoking, a person can take information based on others'

attempts at quitting to determine the person's own likelihood of quitting. Unlike social learning

theory, however, locus of control also contains an element of internal and external control. With

locus of control, the person is the "locus" – therefore, a person's belief in their own ability to

achieve an outcome is an internal locus, while a person's belief in forces outside of that person,

such as luck or fate, is an external locus (Rotter, 1966).

Locus of control has a significant application in health psychology, as it can have an

effect on health-related behaviors and outcomes, such as smoking. Someone who believes they

have an internal locus of control may focus on their own self-efficacy and effort in order to

achieve a health outcome; therefore, someone who has more faith in their abilities and self-

efficacy may be more likely to succeed at quitting smoking and maintaining abstinence than

someone who has little faith in their abilities and self-efficacy. On the other hand, a person who

relies on the external locus of control may believe that luck plays a part in quitting smoking. In

health scenarios, however, Wallston et al. (1978) suggest that external locus of control can relate

to "powerful others" as well as luck or chance. With regard to smoking, "powerful others" can

refer to medical professionals (such as doctors who can provide consultations on smoking

cessation and prescribe aids to help quit), but can also refer to family and friends who act as a

person's support system, either more positively (e.g., support the individual in quitting) or less

positively (e.g., continuing to smoke in front of the person, trying to pressure the person into

smoking).

Locus of Control and Smoking

There are several studies of locus of control and cigarette use in adolescents. Studies have

found that adolescents who smoke were more likely to have an externally oriented locus of

control (Clarke et al., 1982), including higher scores in chance subscales and lower scores in powerful others and personal control subscales than their never-smoking counterparts (Eiser et al., 1989). Bennett et al. (1997) also found that out of the three locus of control dimensions (internal, external, and chance), only higher levels of chance had a significant relationship with higher smoking frequency ($\beta = .07$, $p < .001$).

Additionally, there are several findings related to locus of control and smoking cessation among adults. Calnan (1989) found that adults had higher levels of success with smoking cessation when they had higher levels of internal locus of control (r = 0.0372, $p < 0.05$) and higher levels of belief in chance (r = 0.0582, $p < 0.001$), but the relationships were modest. Sheffer et al. (2012) found that among adults who smoked, higher levels of external locus of control predicted an increased likelihood in smoking relapse ($p = 0.03$). Stuart, Borland, and McMurray (1994) found that participants who successfully maintained abstinence following a smoking cessation intervention had lower levels of the "powerful others" dimension, which increased as the intervention continued, suggesting an increased need for support or accountability.

Taken together, the data suggest that there is a modest relationship between higher levels of external locus of control and fate or chance and increased smoking and smoking relapse. This relationship is consistent with the idea of people who smoke may not feel that they are in control over their health and can also be a way to manage the cognitive dissonance of continuing to smoke despite knowing the health consequences. The findings also suggest that those who continue to smoke may not find their doctors to be a powerful enough factor in motivation to quit smoking. Finally, individuals who are more internally oriented are more likely to be successful at smoking cessation and abstinence. This data can have clinical implications, as Best and Steffy

(1975) found that providing different types of smoking cessation treatment depending on whether the participants had internal or external locus of control was associated with the interventions having more successful outcomes.

Locus of Control and HIV

There is little current research about smoking-related locus of control among PLWHA. Most self-concept research regarding HIV/AIDS focuses on how locus of control is related to quality of life with HIV/AIDS (Simoni & Ng, 2002; Préau et al., 2005), psychological adjustment and psychopathology (Spalding, 1995; Field & Kruger, 2008), risk of HIV/AIDS (Loue et al., 2004), or medication use (Barclay et al., 2007; Evans et al., 2000). For example, two studies found relationships between health-related locus of control and medication use among PLWHA. Barclay et al. (2007) found that poorer ART adherence was found in young adults with lower levels of internal locus of control (t(138) = 2.20, p = 0.03) and higher levels of chance in locus of control (t(138) = -1.96, p = 0.05). Also, Evans et al. (2000) found that compared to participants who were not on protease inhibitor therapy, while there were no significant differences on the internal and chance scales, those who were on protease inhibitor therapy had higher levels of belief in powerful others (t = -4.8, p < 0.001). Although these results on locus of control pertain to medication use and adherence, they may translate to other health-related outcomes, including smoking cessation.

One previous study was identified that assessed locus of control related to smoking among PLWHA. Shuter et al. (2012) used a variation of Donovan & O'Leary's Drinking-Related Locus of Control Scale (DRIE), a scale for perceived locus of control related to alcohol consumption. The three subscales similar in the DRIE are the same as the in Health-Related Locus of Control (Wallston, Wallston & DeVellis, 1978): internal locus of control is called the

intrapersonal locus of control subscale ("I feel powerless to prevent myself from drinking when I am anxious or unhappy"), powerful others is the interpersonal locus of control subscale ("Oftentimes, other people drive me to drink"), and fate/chance is the fate subscale ("Most people do not realize that drinking problems are influenced by accidental happenings"). Shuter et al.'s (2012) variation of the DRIE replaces "drinking" with "smoking." Among a sample of PLWHA who report current cigarette use in the Bronx, New York (n = 60; mean age = 46.8 ± 7.2; 53.3% male, 46.7% female; 50.0% Latino/a, 36.7% Black, 3.3% White, 10.0% other; Shuter et al., 2012), participants reported mean scores of intrapersonal locus of control (M = 3.4, SD = 1.3, range of mean scores = 1-6, with higher scores indicating greater intrapersonal locus of control), interpersonal locus of control (M = 3.9, SD = 1.2, range of mean scores = 1-6, with higher scores indicating greater interpersonal locus of control), and fate (M = 3.8, SD = 1.4, range of mean scores = 1-6, with higher scores indicating greater fate locus of control). These scores suggested that PLWHA who smoke reported slightly higher levels of external locus of control than internal locus of control. However, smoking-related locus of control has not been analyzed in a larger context, such as in relation to other characteristics (e.g., motivation to quit smoking or perceived risks and benefits of smoking), or as part of a larger model of psychological factors contributing to smoking cessation.

Rationale

Self-evaluations, including self-efficacy, self-concept, and locus of control, have been shown to be important when examining biopsychosocial factors that contribute to cigarette smoking. Previous research has found a consistent relationship between higher levels of self-efficacy and increased success in smoking cessation and between higher levels of external locus of control and both greater smoking and less motivation to quit smoking. Because self-

evaluations among PLWHA have not been examined in developing countries; however, it is not clear if these measures will be useful for studies of PLWHA in developing countries. The present study will examine the psychometrics and validity of self-evaluation measures (i.e., Velicer et al. (1990)'s Self-Efficacy/Temptation Scale; Shadel, Mermelstein & Borelli(1996)'s Smoker and Abstainer Self-Concept Questionnaire; and Shuter et al. (2012)'s adaptation of Donovan & O'Leary (1978)'s Drinking-Related Locus of Control Scale) in a sample of PLWHA who smoke cigarettes in Kenya. The present study will also compare the results with those from a sample of PLWHA who smoke from the Bronx, NY, who answered the same questionnaires regarding self-evaluations (Shuter, Bernstein, & Moadel, 2012).

Significance

The significance of this study lies in the current geopolitical state of the tobacco industry and the effect it is having on developing countries. Because major tobacco companies began to focus their attention on developing countries (both as producers and as consumers of tobacco), people in these countries are already experiencing the problems caused by the industry. In addition to the well-known health problems caused by and associated with tobacco use (U.S. Department of Health and Human Services, 2014), the industry's involvement in these countries has also caused environmental and economic impacts on current and future generations. People in developing countries may be especially vulnerable because their governments do not have the resources to fight against the harmful consequences of the tobacco industry, and often even promote tobacco farming as a way to bolster their economies. As a result of the lack of resources in some other countries, the United States has begun conducting and funding research on tobacco use in developing countries in Africa, in addition to devoting resources devoted to the HIV/AIDS epidemic in those countries. This study, which seeks to validate several measures of self-

evaluation in a sample of PLWHA in Kenya, will be important for future research on smoking-related behavior including smoking cessation in PLWHA in developing countries as researchers will need information about the validity and usefulness of these scales when developing study methodology, analyzing data, and interpreting results.

Innovation

The most innovative part of the proposed study is the sample from which the data were collected. Data on smoking-related self-efficacy among PLWHA have been collected in developed countries, such as the United States (Shuter et al., 2012), and smoking-related self-efficacy has been studied in general samples in developing countries (DiClemente, 1981; McIntyre, Lichtenstein, & Mermelstein, 1983; Baer, Holt & Lichtenstein, 1986; Stuart, Borland, & McMurray, 1994), but not among a sample of PLWHA in a developing country such as Kenya. Smoking-related self-concept has been examined in the general population of developed countries (Shadel, Mermelstein & Borrelli, 1996; Chassin et al., 1981; Snow & Bruce, 2003; Thornton et al., 1999; Falomir & Invernizzi, 1999; Tombor et al., 2013), has only been examined in one study in PLWHA in a developed country (Shuter et al., 2012), and has not yet been studied among PLWHA in developing countries. Data on smoking-related locus of control has only been examined in the general population of developed countries (Clarke et al., 1982; Eiser et al., 1989; Bennett et al., 1997; Calnan, 1989; Stuart, Borland, & McMurray, 1994), but not among PLWHA including PLWHA in developing countries.

Given that previous research has primarily examined smokers in the general population, with little research on PLWHA who smoke; examined samples from developed countries with little research on developing countries; or examined the combination of both (PLWHA in developed countries); the current study using a sample of PLWHA in a developing country is

extremely innovative. It is because of this innovative sample, therefore, that the psychometrics of the data need to be validated before examining further relationships with it.

Study Aims

Aim 1: To examine the psychometric properties (i.e., factor analysis, internal consistency reliability, convergent/divergent validity) of Velicer et al. (1990)'s Self-Efficacy/Temptation Scale in a sample of Kenyan adults living with HIV/AIDS who smoke cigarettes. It is hypothesized that the self-efficacy measure will demonstrate adequate convergent and divergent validity suggesting the usefulness of this measure in future samples in developing countries. It is also hypothesized that the factor structure found for the scale in this sample, including number of subscales and content in each subscale, will be similar to previous psychometric data from the United States in adults living with HIV/AIDS who smoke cigarettes (Shuter et al., 2012).

Aim 2: To examine the psychometric properties (i.e., factor analysis, internal consistency reliability, convergent/divergent validity) of Mermelstein & Borelli (1996)'s Smoker and Abstainer Self-Concept Questionnaire in a sample of Kenyan adults living with HIV/AIDS who smoke cigarettes. It is hypothesized that the self-concept measure will demonstrate adequate convergent and divergent validity for use in future samples in developing countries. It is also hypothesized that the factor structure found for the scale in this sample, including number of subscales and content in each subscale, will be relatively similar to previous data from the United States in adults living with HIV/AIDS who smoke cigarettes (Shuter et al., 2012).

Aim 3: To examine the psychometric properties (i.e., factor analysis, internal consistency reliability, convergent/divergent validity) of Shuter et al. (2012's adaptation of Donovan & O'Leary (1978)'s Drinking-Related Locus of Control Scale in a sample of Kenyan adults living with HIV/AIDS who smoke cigarettes. It is hypothesized that the locus of control measure will

demonstrate adequate convergent and divergent validity for use in future samples in developing countries. It is also hypothesized that the factor structure found for the scale in this sample, including number of subscales and content in each subscale, will be relatively similar to previous data from the United States in adults living with HIV/AIDS who smoke cigarettes (Shuter et al., 2012).

Exploratory Aim 1: To compare the results of the above aims with data from a sample of PLWHA taken from the Bronx, New York (United States) who completed similar measures of self-concept, self-efficacy, and locus of control. Data for the United States comparison sample includes 60 PLWHA who reported current cigarette use and were recruited from the Montefiore Medical Center, Center for Positive Living in the Bronx, New York (mean age = 46.8 ± 7.2; 53.3% male; 50.0% Latino/a, 36.7%; Shuter et al., 2012) were collected between May and August 2006. It is hypothesized that there will be general differences in scores between the two samples, potentially due differences in language and/or different cultural practices around cigarette smoking.

Exploratory Aim 2: To use qualitative data from focus groups conducted with adults in Kenya living with HIV/AIDS who smoke cigarettes to examine themes and variables related to self-evaluations and smoking behavior. We examined whether the qualitative data provided complementary information to the quantitative data examined in Aims 1, 2, and 3 and provide insights into self-evaluations and smoking beliefs and behaviors among Kenyan PLWHA who smoke cigarettes.

CHAPTER II

This study is a secondary analysis of data from a larger parent study titled "Optimizing Smoking Cessation Interventions for People Living with Human Immunodeficiency Virus (PLWH) In Nairobi, Kenya" (KNH-UON ERC Number P901/12/2018; PI: Seth Scott Himelhoch, M.D., M.P.H.). The parent study is a four-branch randomized control trial, where 75 participants are assigned to each group: 1) placebo and standard of care smoking cessation information, 2) placebo and Positively Smoke Free (PSF) intervention (Stanton et al., 2020; Moadel et al., 2012), 3) bupropion and standard of care smoking cessation information, and 4) Bupropion and Positively Smoke Free intervention, totaling 300 participants. The primary purpose of the parent study is to compare the effects of Bupropion and PSF, both separately and in combination, compared to standard of care and placebo treatment.

While parent study is currently ongoing (started in June 2020), preliminary data has already been collected. The structured interviews (n = 50), which included information on the self-evaluation variables and smoking-related cognition variables, were completed between September and November 2019. The focus groups (eight participants in each of the three focus groups, for a total N of 24), which included qualitative data on smoking and smoking cessation, were completed in November and December 2019.

The primary purpose of the present study was to use data collected through the structured interviews and focus groups described above to validate several self-evaluation variables – self-efficacy, self-concept, and locus of control – in a sample of participants living with HIV/AIDS in Kenya. There are two samples that were used for the analyses for the present study. The structured interviews, which included the questionnaires pertaining to self-evaluations and smoking-related cognitions (used in Aims 1-3 and Exploratory Aim 1), had a participant sample

size of 50. The three focus groups (used in Exploratory Aim 2) had a total sample of 24 participants.

In this study, data from the parent study were also compared to data collected in a separate study examining smoking beliefs and behaviors in a sample of PLWHA in the Bronx, New York (see Shuter et al., 2012). A sample of 60 participants, recruited through the Center for Positive Living in Montefiore Medical Center, were interviewed and were assessed on several domains of smoking, including tobacco use history and behaviors, nicotine dependence, readiness to quit, motivation to quit, self-efficacy and temptation, locus of control, smoker and abstainer self-concept, social support, anxiety and depression, perceived risks and benefits, advice from providers about smoking cessation, and interest in various smoking cessation interventions.

Participants

Participants were recruited from four HIV care clinics and two methadone clinics in Nairobi, Kenya. Inclusion criteria for the parent study required participants to: 1) have a confirmed diagnosis of HIV and be receiving treatment at the participating clinic, 2) be age 18 or older, 3) be smoking ten or more cigarettes per day (as per self-report), 4) express motivation to quit smoking (as shown by a score between 5-8 on the Abrams and Beiner Contemplation Ladder), 5) not meet DSM-5 criteria of moderate or severe alcohol use or substance abuse disorder (as reported in the MINI International Neuropsychiatric Interview, Drug and Alcohol sections), 6) be able to read and speak English and/or Swahili, and 7) be able to provide informed consent to participate in the study.

Exclusion criteria for the parent study included: 1) current suicidal thoughts or ideation in the past month (as reported in the MINI International Neuropsychiatric Interview, Suicide

section), 2) self-report use of bupropion in the last three months, 3) previous allergic reaction or sensitivity to bupropion, 4) pregnancy, nursing, or planning to become pregnant, 5) use of any medication determined by the study physician to interfere with bupropion, 6) moderate to severe renal impairment, 7) unstable cardiovascular disease, 8) dementia (as shown by score of 10 or below on the Hopkins HIV Dementia Scale), 9) levels of <5ppm on an expired carbon monoxide breath test (i.e., suggesting no current cigarette use), and 10) determination from the study physician that the individual is not medically stable enough for participation. For the current study, there were no additional inclusion or exclusion criteria.

Study Procedures

Recruitment procedures

Participants were either referred through their treatment teams or were self-referred from IRB-approved flyers in clinic waiting rooms. Research assistants conducted screenings to see if participants were eligible, including a medical chart review, an expired carbon monoxide breath test, the MINI International Neuropsychiatric Interview (Sections: Alcohol, Drug, and Suicide), Readiness to Quit Ladder, and the Hopkins HIV Dementia Scale. Clinic staff also provided lists of clients to research assistants who reviewed and discussed potential study eligibility prior to approaching clients. After the initial screen, participants went through an evaluation phase which included a detailed medical history and physical exam, a pregnancy test, and an expired carbon monoxide breath test.

Consent procedures

Participants went through an extensive informed consent procedure. Consent forms were provided in Swahili and English, and research assistants reviewed the paperwork with the participant in the language the participant was most comfortable with. Research assistants

reviewed all components of the study with participants, emphasizing risks and benefits. To determine if consent was understood, research assistants asked potential participants a series of questions about the study. If the participant answered the questions correctly and consented, they would be enrolled in the study. If potential participants did not answer questions correctly on the first try, the research assistant would review the sections of the consent procedure that were not answered correctly, and the participant would be asked the questions again. If the potential participant was still unable to answer the questions correctly, they would not be enrolled in the study. Enrolled participants signed two copies of the consent form: one copy was kept for the research team's records, and the other copy was given to the participant for their records.

Study appointments

Participants first completed a baseline appointment, where they filled out the intake self-report measures and were randomized into one of four treatment branches that had either a placebo or bupropion, and either standard of care smoking cessation treatment or the PSF intervention. During the interventions, participants had follow-up appointments during weeks 1, 2, 4, and 8, where they were given medication or placebo refills, completed an expired carbon monoxide breath test, and answered questions regarding medication adherence and side effects, mood, and smoking status. Participants had two other follow-up appointments at week 12 and week 36 where they filled out additional self-report questionnaires. Some participants were also called back for qualitative interviews. All participants were compensated KSh 500 (approximately $4.63 in US currency) for each visit attended. The present study only uses data obtained from the baseline appointment. Measures from the parent study that were included in the present study are listed below.

Materials and Measures.

Demographics

Demographic information was collected as part of the structured interviews. General

demographic information that was collected included language in which the interviews were

conducted, age, gender, marital status, religion, education, employment status, housing situation,

monthly household income, geography, and members of the participant's household who smoke.

Medical demographic information that was collected included number of years since HIV

diagnosis, method of HIV transmission, use of antiretrovirals both in the past and currently,

duration of antiretroviral use, and the presence of diagnoses for physical and psychological

disorders. Data pertaining to medication and substance use, as well as treatment included the

past or current use of medications or substances, whether those medications or substances were

prescribed by a doctor, and whether participants engaged in treatment for substance use or

mental health previously or currently. Tobacco use demographic information that was collected

included types of tobacco products used, average number of cigarettes smoked per day, current

frequency of smoking, types of cigarettes smoked, method of purchase, presence of others in the

household who smoke, age participant began smoking, duration of smoking, number of quit

attempts, duration of longest quit attempt, types of quit attempts used, and level of nicotine

dependence as measured by the Fagerström Test of Nicotine Dependence (FTND).

Self-Efficacy

Self-efficacy was measured using the 20-item Self-Efficacy/Temptation Scale (Velicer et

al., 1990). This questionnaire measures how much individuals experience both self-efficacy and

temptation in situations where one is tempted to smoke. Items are rated on Likert scale ranging

from 1 ("not at all tempted") to 5 ("extremely tempted"), and higher scores indicate higher levels

of temptation and lower levels of self-efficacy. The original measure has three subscales: positive/social ($\alpha = 0.86$), negative/affective ($\alpha = 0.95$), and habit/addictive ($\alpha = 0.80$), measuring levels of temptation due to positive or social situations, negative affect, and habit/addiction, respectively (Velicer et al., 1990).

Self-Concept

Self-concept was measured using the Smoker and Abstainer Self-Concept Questionnaire, a 9-item measure that examines how an individual views him/herself as a smoker or abstainer (Shadel, Mermelstein, & Borrelli, 1996). This measure is divided into two subscales: a 5-item Smoker Self-Concept Scale and a 4-item Abstainer Self-Concept Scale. Items are scored using Likert values ranging from 1 ("strongly disagree) to 10 ("strongly agree"). The Smoker Self-Concept Scale has an alpha coefficient of 0.74, and the Abstainer Self-Concept Scale has an alpha coefficient of 0.77, suggesting that each scale has acceptable internal consistency (Shadel & Mermelstein, 1996).

Locus of Control

Locus of control was measured using a modified version of Donovan and O'Leary's Drinking-Related Locus of Control Scale (DRIE) (Donovan & O'Leary, 1978; Hartmann, 1999; Shuter, Bernstein, & Moadel, 2012). The DRIE is a 25-item scale that measures locus of control beliefs in alcohol consumers and contains three subscales: interpersonal, intrapersonal, and fate. The items were scored using Likert values ranging from 1 ("strongly disagree") to 6 ("strongly agree"). Cronbach's alpha was reported to be 0.77 (Donovan & O'Leary, 1978). The adaptation of the DRIE used in this study was created by Shuter et al. (2012), where the content related to alcohol is replaced with smoking behaviors. The interpersonal, intrapersonal, and fate subscales remain the same.

Qualitative Focus Group Interviews

Three focus group interviews were conducted that lasted approximately 60 minutes each (total N for all focus groups = 24). The focus groups were conducted in Swahili and translated to English using a translation service. Participants were asked about reasons for smoking, barriers to quitting smoking, facilitators to quitting smoking, relationship between HIV and smoking, and helpfulness of HIV providers in terms of smoking information and cessation support (including degree of helpfulness and what is and is not helpful for participants). See Appendix A for the complete focus group interview guide and prompts. It is important to note that the participants in the focus groups were a separate group of participants than those who completed the self-evaluation measures during the structured interview.

Statistical Analysis

All quantitative analyses were conducted using SPSS version 26. Aims 1-3, each of which examined the psychometrics of one of the three measures (Aim 1 examined the Self-Efficacy/Temptation Scale; Aim 2 examined the Smoker and Abstainer Self-Concept Questionnaire; Aim 3 examined the adaptation of Drinking-Related Locus of Control scale), had similar procedures with regard to data analysis. Exploratory factor analysis (EFA) was chosen compared to principal component analysis (PCA) because this study focused on examining the measures in a new population with a high likelihood of interpreting questions differently. Using EFA, therefore, was appropriate because the analysis would operate under the assumption that the results are new, rather than confirmatory. First, preliminary analysis examined distribution patterns and inter-item correlations to determine if there were any test items that may need to be removed from the models for each of the three measures. Cronbach's alpha was used to determine internal consistency reliability. In terms of validity, divergent validity was measured

using bivariate correlations between the overall measure total and age, for each of the three measures, and convergent validity was measured using bivariate correlations between each of the three self-evaluation measures (self-efficacy, self-concept, and locus of control).

For the factor analysis for Aims 1-3, the number of factors in each solution was found using both Eigenvalues greater than one and Horn's parallel analysis. This was done in order to provide options for number of factors in case one model was a better fit than another. Initial factor analysis was conducted using orthogonal varimax rotations, because the factors being analyzed were likely to be independent of each other (for self-efficacy, these factors were positive/social, negative/affect, and habit/addiction; for self-concept, these factors were smoker and abstainer self-concept; and for locus of control, these factors were internal, external, and fate/chance). If the results of the factor analysis models did not make conceptual sense upon inspection (e.g., whether the content of the test items could be grouped together theoretically, whether there were large differences in the number of items that loaded onto each factor, or whether items loaded onto multiple factors), new models were run using different numbers of factors and different rotations.

For Exploratory Aim 1 (examining differences in the Kenya sample and Bronx sample), the two databases containing information for each sample were cleaned and merged in SPSS. Demographic information in this combined database included age, gender, marital status, race/ethnicity (notably, due to major differences between the two samples, this item needed to be recoded for merging to occur), religion, education, employment status, housing situation, years since HIV diagnosis, method of HIV transmission, antiretroviral use, age started smoking, number of years smoking, average number of cigarettes per day, number of quit attempts, duration of longest quit attempt, and types of quit attempts made. As gender, marital status,

race/ethnicity, religion, education, employment status, housing situation, method of HIV transmission, antiretroviral use, number of quit attempts, and types of quit attempts were categorical variables, chi-square tests were used to examine statistical differences. All other variables, including the remainder of the demographic variables and mean scores per test item and total score for each of the three measures, were continuous variables, and so t-tests were used to examine differences between the two samples. The analyses used a confidence interval of 99% to control for familywise error.

Exploratory Aim 2, which used qualitative data to examine themes that arose during focus groups, used a codebook, several coders, and NVivo version 12. A codebook examining themes in focus groups among people who smoked and had hepatitis C was developed in the fall of 2019. Four research assistants developed the codebook by making lists of potential themes, and condensing and organizing the lists into specific overarching themes, including themes related to hepatitis C, general tobacco use, tobacco use and hepatitis C, addiction, mental health, and social/interpersonal problems. This codebook was adapted for analysis by us for PLWHA by changing "hepatitis C" to "HIV," as the subthemes and overarching themes were general enough to be relevant across both chronic illnesses. As a result, the majority of subthemes and all the overarching themes remained the same. Two coders identified themes and marked them in the transcripts individually in Microsoft Word documents. The codes were then manually inputted into NVivo, where analyses were run to determine interrater reliability and queries were run to examine how many times each of the themes were coded in the focus groups. The resulting tables included one table that examined the number of times each theme was coded, broken down by transcript, as well as six tables (one for each overarching theme) that included quotes most illustrative of each subtheme (see Results section).

CHAPTER III

Demographic Information

Table 1 shows the general demographics of the sample of PLWHA who smoke in Kenya who participated in the structured interviews (N = 50). The majority of the interviews were conducted in Swahili or a combination of Swahili and English. The average age of participants was 38.45 years (SD = 9.26, range = 20 – 57). Most of the participants identified themselves as male, African, Christian, either married/living with a partner or separated, having completed at least some primary or secondary education, working in some capacity, and having stable housing. More than half of the participants grew up in Nairobi County. Household monthly income ranged from 24,000KSh ($217.88) to 300,000KSh ($2,723.56), with a median of 108,000KSh ($980.48). Most participants did not live with their mothers, fathers, siblings, or roommates. About half of the sample's participants reported that they lived with a spouse and that about half of the spouses smoked cigarettes as well. About half of the sample's participants reported that they lived with children and reported that none of the children smoked.

Table 2 shows medical demographic information for the sample included in the structured interviews. Participants reported becoming infected with HIV primarily through injection drug use, heterosexual contact with an infected partner, or use of needles unrelated to drug use, such as tattooing; nearly one-quarter of participants, however, reported that they did not know how they became infected with HIV. On average, participants had been diagnosed with HIV 6.48 years prior to the interview (SD = 4.42, range = 0 – 17). All participants reported currently taking antiretroviral medication. On average, participants had been taking antiretroviral medication for approximately 5 years (SD = 3.58, range = 0.25 – 17). Most participants did not report being hospitalized for any reason in the last five years. No participants had ever reported

being diagnosed with or treated for cryptococcal meningitis, high cholesterol, diabetes, heart disease, or cancer. Fifteen participants reported having been diagnosed with bacterial pneumonia in the past, eighteen reported being diagnosed with tuberculosis in the past, three reported being diagnosed with high blood pressure (one in the past, one with a current diagnosis but not being treated, and one currently being treated), two reported currently being treated for asthma, two reported past diagnosis of a lung disorder other than asthma (such as COPD), ten reported a diagnosis of depression (six with a past diagnosis, two with a current diagnosis but not being treated, and two currently being treated), and nine reported a diagnosis of anxiety or panic disorder (seven with past diagnoses, one with a current diagnosis but not being treated, and one currently being treated).

Table 3 shows the substance use and treatment for substance use demographics for the sample included in the structured interviews. More than half of the participants reported having used anti-depressants, anti-anxiety medication, anti-psychotic medication, sedatives, painkillers, marijuana, heroin, alcohol, methadone, and miraa. Out of the substances that were prescribed (i.e., anti-depressants, anti-anxiety medication, anti-psychotic medication, amphetamines, sedatives, painkillers, marijuana, and methadone), the vast majority of participants reported not having a prescription for that medicine, with the exception of methadone, where all participants had a doctor's prescription. Additionally, out of all the participants who took methadone, all of them either were attending a methadone treatment program regularly or had completed a methadone treatment program. The majority of participants reported never attending a treatment program for alcohol or drug use, or a mental health treatment program.

Table 4 elaborates on the tobacco use of the sample. Consistent with the study inclusion criteria, all participants reported smoking cigarettes. Two participants reported also using

chewing tobacco and 2 participants reported also using nasal snuff while no participants reported using oral snuff, bidis, hookah, a pipe, or cigars. Most participants reported smoking cigarettes every day and the average number of cigarettes smoked per day was approximately 15. Most participants smoked regular cigarettes most frequently in the last thirty days, rather than menthol cigarettes or sweet menthol cigarettes. All participants purchased their cigarettes as one or several at a time, and no one reporting buying packs of cigarettes. More participants did not have others who smoke in their home than participants who did.

On average, participants reported beginning to smoke cigarettes at 17.53 years old (SD = 4.83, range = 9 – 30) and reported smoking for a duration of 22.14 years (SD = 9.34, range = 1 – 44). Most participants fell into three categories regarding number of quit attempts: fifteen reported never attempting to quit, twenty-two reported attempting to quit between one and five times, and eleven reported attempting to quit eleven or more times. The data showed a heavy skew towards shorter lengths of time for the longest quit attempts. The median length for longest quit attempt was 0.25 months (approximately one week), with quit attempts ranging from 0.0175 months (half a day) to 48 months (four years). Out of the participants who reported how they attempted to quit cigarette smoking (N = 39), most participants tried to quit without assistance, while four tried using nicotine replacement therapy and one tried using individual therapy. No one reported using Zyban or another antidepressant, Varenicline or Chantix, group intervention, or hypnosis to try to quit smoking. On average, participants reported a Fagerström Test of Nicotine Dependence (FTND) score of 5.37 out of 10 (SD = 2.14, range = 0 – 9), indicating a moderate level of nicotine dependence.

For additional demographic information for this sample, see Shuter et al. (2021).

Aim 1 (Self-Efficacy/Temptation Scale) Results

Preliminary Analysis

Several steps were taken prior to exploratory factor analysis to ensure best analysis practice. First, two participants were excluded due to incomplete data, leaving a total of $N = 48$. Second, SPSS was used to calculate the frequency of responses to test items to better understand patterns of distribution. Visual inspection of the data showed that most participants responded either 1 or 5 on the Likert scale and fewer participants responded with answers in the middle, suggesting a sense of extremity in responses (i.e., participants were either "not at all tempted" or "extremely tempted," and fewer people reported moderate levels of temptation in various situations). As a result, the self-efficacy scale did not show a normal distribution. Spearman correlations were run between items to determine if any questions were poorly correlated with other test items, which would suggest the need to remove them (see Tables 5-6). One item was found to have low inter-item correlations with the other test items (levels of temptation when "at a bar or cocktail lounge having a drink"). The fact that this item does not correlate well with others in the measure makes sense given the smoking restrictions in Kenya and the resulting smoking practices. Kenya's 2007 Tobacco Control Act prohibits smoking in "restaurants, hotels, bars or other eating place[s]… except in designated smoking areas" (Tobacco Control Act, 2007). Because smoking is banned specifically in bars, it would be against cultural practice to smoke there, and as a result, a test item indicating smoking temptation in a place where smoking is not allowed to occur (and the only test item referring to a place rather than a situation) would likely not relate to other items. Therefore, this item was removed during factor analysis.

Reliability and Validity Analysis

Internal consistency reliability analysis for the self-efficacy scale showed that the Cronbach's alpha was 0.853, indicating good internal consistency.

Divergent validity was assessed using a chi-square test on the self-efficacy measure total and marital status. There was no significant correlation between marital status and self-efficacy scores, suggesting that these two measures were not related (χ^2 (32) = 35.283, p = 0.316).

Convergent validity was assessed using bivariate correlations between the self-efficacy measure total score and the self-concept and locus of control total scores, as all three measures assess some form of self-evaluation. Self-efficacy was found to have a small correlation with self-concept significant at the p = 0.1 level (r = 0.244, p = 0.094) and a significant moderate correlation with locus of control (r = 0.474, p = 0.001), suggesting that self-efficacy and self-concept do not overlap significantly, but self-efficacy and locus of control have enough similarity to be somewhat useful in determining convergent validity. However, while all three of these measures assess some form of self-evaluation, each measures a different type of self-evaluation and therefore the constructs do not measure exactly the same concept, which is a significant limitation in evaluating convergent validity in this case.

Factor Structure

Factor analysis was performed on the self-efficacy measure using the method of maximum likelihood for factor extraction as recommended by Costello & Osbourne (2005). Assumptions of appropriate sample size and utility of factor analysis were met. The Kaiser-Meyer-Olkin's measure of sampling adequacy was 0.70, which was above the acceptable level of 0.50, and Bartlett's test of sphericity was significant (p < 0.001). While initial analysis showed that six factors have Eigenvalues above 1, Horn's parallel analysis indicated that a two-factor model would be a better fit (see Table 7).

Table 8 showed the results of the two-factor solution as proposed by the Horn's parallel analysis and used a varimax rotation under the assumption that the two factors are conceptually independent of each other (different types of situations, including "celebrating with friends" or "when extremely anxious or stressed," are conceptually independent). This model contributed to 42.88% of the overall variance. The first factor, which accounted for 25.52% of the overall variance, focuses on situations where participants experience negative emotions (e.g., when "very angry about something or someone," "extremely depressed," or "extremely anxious"), and certain aspects of addiction (e.g., "when I first need a lift," "when I first get up in the morning," or "when I am craving a cigarette"). The second factor, which accounted for 17.36% of the overall variance, focuses on situations where participants experience positive emotions (e.g., "when I am happy and celebrating"), social situations (e.g., "with friends at a party," or "over coffee or tea while talking and relaxing"), and some parts of addiction and boredom (e.g., "when I realize I haven't smoked for a while," or "when I realize that quitting smoking is an extremely difficult task for me").

However, this model presented some questions about interpretation. Three of the test items (i.e., "when things are just not going the way I want and I am frustrated," "when I would experience an emotional crisis, such as an accident or death in the family," and "when I wake up in the morning and face a tough day") loaded significantly onto both factors and had very small differences between the two factor loadings (for example, "when I wake up in the morning and face a tough day" had a loading value of 0.551 for Factor 1 and 0.514 for Factor 2). Additionally, the content of the two factors did not fall into relatively discrete categories – while Factor 1 included affective and negative content and Factor 2 included positive and social content, both factors also included elements of addiction.

Therefore, a second model was run to see how the fit for three factors compared to the fit for the two factors identified above. The second model used three factors based on the previous analyses from Velicer et al. (1990), which suggested that the scale had the following three factors related to self-efficacy: positive/social, negative/affect, and habit/addictive. This model was theorized because it could potentially remedy the issue with addiction and habit content loading on to both factors as found in the first model. Additionally, as per the recommendation of Costello & Osbourne (2005), who posit that factors are not usually independent of each other in the social sciences, the solution found used an oblique rotation to accommodate for the relationships between subscales.

The three-factor solution data for the Self-Efficacy/Temptation Scale can be found in Table 9. The solution accounted for 51.2% of the overall variance. The first factor, accounting for 30.6% of the variance, was similar to the negative/affect subscale of Velicer et al.'s validation results (1990). The second factor, accounting for 12.3% of the variance, was similar to the positive/social subscale of Velicer et al.'s validation results (1990). The third factor, accounting for 8.3% of the variance, was similar to the habit/addiction subscale in Velicer et al.'s results (1990).

Overall, most of the test items loaded onto the same subscales they were part of in Velicer et al.'s results. Several of the items added to the scale by Shuter et al. (2012) also loaded onto subscales adequately; one item, however ("when I realize I haven't smoked in a while"), which would conceptually be expected to belong in the habit/addictive subscale, loaded onto the positive/social scale. Additionally, an item created by Velicer et al. (1990) ("when I realize that quitting smoking is an extremely difficult task for me"), loaded onto the positive/social subscale instead of the habit/addictive subscale as it did in this previous study. Overall, however, this

three-factor solution showed some strengths compared to the two-factor solution. First, it accounted for addiction/habit in a subscale separate from the negative/affect and positive/social subscales, so different content was placed in more discrete variables. Second, even though there was slight overlap in test items between factors, test items overlapped significantly less than they did in the two-factor solution, making them easier to interpret within the context of the whole scale.

<div align="center">**Aim 2 (Smoker and Abstainer Self-Concept Questionnaire) Results**</div>

Preliminary Analysis

Several steps were taken prior to confirmatory factor analysis to ensure best analysis practice. First, SPSS was used to calculate the frequency of responses to test items to better understand patterns of distribution. Visual inspection of the data showed that most participants responded either 1 or 10 on the Likert scale and fewer responded with answers in the middle, suggesting a sense of extremity in responses (i.e., participants either "strongly disagreed" or "strongly agreed" with statements concerning self-concept as a smoker and fewer people reported moderate levels of agreement). As a result, the self-concept scale scores were not normally distributed. Spearman correlations were run between items to determine if any items had low correlations with other test items, which would suggest the need to remove these items (see Tables 10-11). While there were a number of items that did not correlate substantially with each other, no items were removed because there were very few correlations higher than 0.100.

Reliability and Validity Analysis

Internal consistency reliability analysis was conducted separately for "smoker" and "abstainer" self-concept factors. Cronbach's alpha for smoker self-concept was 0.776,

demonstrating acceptable internal consistency reliability. Cronbach's alpha for abstainer self-concept was 0.569, demonstrating poor internal consistency reliability.

Divergent validity was assessed using a chi-square test for the self-concept measure total and marital status. The results showed that there was no significant correlation between marital status and self-concept scores, suggesting that these two measures are not related (χ^2 (104) = 76.154, p = 0.982).

Convergent validity was assessed using bivariate correlations between the self-concept measure total score and the self-efficacy and locus of control total scores, as all three measures assess some form of self-evaluation. Self-concept demonstrated a small correlation with self-efficacy at the p = 0.1 level (r = 0.244, p = 0.094), and a significant moderate correlation with locus of control (r = 0.405, p = 0.003), suggesting that self-concept and self-efficacy do not overlap significantly, but self-concept and locus of control have enough similarity to be somewhat useful in determining convergent validity. However, as noted above, while all three of these measures assess some form of self-evaluation, each measures a different type of self-evaluation and therefore the constructs do not measure exactly the same concept, which is a significant limitation in evaluating convergent validity in this case.

Factor Structure

Factor analysis was performed on the self-concept measure using the method of maximum likelihood for factor extraction as recommended by Costello & Osbourne (2005). Assumptions of appropriate sample size and utility of factor analysis were met. The Kaiser-Meyer-Olkin's measure of sampling adequacy was 0.722, which was above the acceptable level of 0.50, and Bartlett's test of sphericity was significant (p < 0.001). Horn's parallel analysis

showed that a one-factor model was appropriate and additional analysis identified that three

factors had Eigenvalues above 1 (see Table 12).

Table 13 shows the results of the three-factor solution as proposed by the number of

Eigenvalues greater than 1. Following Costello & Osbourne's (2005) recommendation to

assume that factors in social science cannot be completely independent of each other, an oblique

rotation was used. This model contributed to 65.49% of the overall variance. The first factor,

which accounted for 38.64% of the overall variance, focused on overall smoker self-concept.

The second factor, which accounted for 15.33% of the overall variance, focused primarily on

imagined future abstainer self-concept (except for "others view smoking as part of my

personality"). The third factor, which accounted for 11.52% of the overall variance, focuses on

perceived current non-smoker self-concept.

This model presented some questions regarding interpretation, however. One of the test

items ("others view smoking as part of my personality") had a factor loading of 0.556 on Factor

1 (smoker self-concept) and a factor loading of 0.572 on Factor 2 (imagined future abstainer self-

concept). These two factors are somewhat opposite of each other. Additionally, it was the only

question that did not emphasize how the participants viewed themselves, but rather how others

perceived them. As a result, a second model was run omitting that particular question.

The second model, as shown in Table 14, identified three factors that accounted for

71.28% of the overall variance. All of the test items remain in the same groupings, but Factors 2

and 3 are reversed. The distinctions are much clearer, as the one test item that loaded onto two

conceptually different factors (smoker and abstainer self-concepts) in the first model, loaded onto

the two abstainer self-concept factors in the second model ("I am comfortable with the idea of

being a non-smoker" had a factor loading of 0.731 on Factor 2 and 0.458 on Factor 3). The first

factor (43.04% of overall variance) focused on smoking self-concept, the second factor (15.66% of overall variance) focused on imagined abstainer self-concept, and the third factor (12.59% of overall variance) focused on perceived current non-smoker self-concept. Overall, the second model appeared to be a better fit for the scale, as it better distinguished between smoker self-concept and abstainer self-concept in the factor loadings.

Aim 3 (Locus of Control Scale) Results

Preliminary Analysis

Several steps were taken prior to confirmatory factor analysis to ensure best analysis practice. First, SPSS was used to calculate the frequency of responses to test items to better understand patterns of distribution. Visual inspection of the data showed that most participants responded either 1 or 6 on the Likert scale and fewer responded with answers in the middle, suggesting a sense of extremity in responses (i.e., participants either "strongly disagreed" or "strongly agreed" with statements concerning locus of control and fewer people reported moderate levels of agreement). As a result, the locus of control scale scores were not normally distributed. Spearman correlations were run between items to determine if any questions were poorly correlated with other test items, which would suggest the need to remove them. While there were a number of items that did not correlate with each other, this was likely because all test items were examined together, and previous locus of control validation reported three subscales that each have different loci of control (self, other people, fate/chance) (Donovan & O'Leary, 1978; Hartmann, 1999; Shuter, Bernstein, & Moadel, 2012). Because all of the loci were conceptually different (i.e., internal locus, external locus focused on other people, external locus focused on fate/chance), it makes sense that items did not correlate with each other, and therefore, no items were removed from analysis.

Reliability and Validity Analysis

Internal consistency reliability analysis showed that Cronbach's alpha was 0.849, indicating good internal consistency.

Divergent validity was assessed using a chi-squared test between the locus of control measure total and marital status. While it was hypothesized that there would be no significant relationship between locus of control and marital status, a significant relationship was found (χ^2 (144) = 172.636, p = 0.052), possibly due to the small sample size. While locus of control and age were not designed to measure similar constructs, a relationship was found, meaning more information is needed to determine divergent validity.

Convergent validity was assessed using bivariate correlations between the locus of control measure total score and the self-efficacy and self-concept total scores, as all three measures assess some form of self-evaluation. Locus of control was found to have significant moderate correlations with self-efficacy (r = 0.474, p = 0.001) and self-concept (r=0.405, p = 0.003), suggesting that locus of control has enough overlap with both measures to be somewhat useful in determining convergent validity. Once again, it is noted that while all three of these measures assess some form of self-evaluation, each measures a different type of self-evaluation and therefore the constructs do not measure exactly the same concept, which is a significant limitation in evaluating convergent validity in this case.

Factor Structure

Factor analysis was performed on the locus of control measure using the method of maximum likelihood for factor extraction as recommended by Costello & Osbourne (2005). Assumptions of appropriate sample size and utility of factor analysis were met. The Kaiser-Meyer-Olkin's measure of sampling adequacy was 0.588, which was above the acceptable level

of 0.50, and Bartlett's test of sphericity was significant ($p < 0.001$). While eight factors had Eigenvalues above 1 (see Table 17), both the minimum partial analysis (MAP) test and Horn's parallel analysis showed that a one-factor model was appropriate (see Tables 17-18).

Table 19 shows the result of the one-factor solution proposed by the MAP test and Horn's parallel analysis. The factor accounted for 23.59% of the overall variance. Out of the twenty-five initial items, seventeen of the items had factor loadings higher than 0.400 and remained in the scale. Notably, the items that had factor loadings below 0.400 came from all three of the previously validated subscales approximately equally, meaning that none of the concepts of the three subscales could be eliminated from the results.

Exploratory Aim 1 Results

Demographics in the Kenya Sample versus the Bronx Sample

Table 20 shows the demographic information compared across the Kenya and Bronx, New York samples (Kenya sample N = 50, Bronx sample N = 60). There were a number of significant differences between the samples. The sample from Kenya was on average 6.5 years younger than the sample from the Bronx. Significantly higher proportions of the sample from Kenya compared to the sample from the Bronx were male (68% vs. 51.7%), married/living with a partner (48% vs. 18.3%) or separated (28% vs. 8.3%), Black (96% vs. 36.7%), and employed full-time (60% vs. 5%) or part-time (22% vs. 3.3%). Significantly higher proportions of the sample from the Bronx compared with the sample from Kenya were single (55% vs. 18%), Hispanic or Latino (50% vs. 0%), identified with a religion not included in the answer choices (11.7% vs. 0%) or no religion (11.7% vs. 0%), completed high school (31.7% vs. 18%) or some college (26.7% vs. 2%), and were unable to work due to disability (58.3% vs. 0%). The two samples had similar proportions of people who were Protestant or Catholic.

In terms of HIV characteristic information, participants from the Bronx held their HIV diagnoses on average for more than double the length of participants from Kenya (13.02 years vs. 6.48 years). Significantly higher proportions of participants from the Bronx compared with the sample from Kenya reported acquiring HIV through heterosexual contact (53.3% vs. 32%) or same-sex contact (25% vs. 0%). Interestingly, although not statistically significant, 100% of the participants from Kenya were currently receiving antiretroviral therapy, while only 95% of the participants from the Bronx had ever been on antiretroviral therapy.

In terms of cigarette use, there were no statistically significant differences between the two samples related to the age of smoking onset and the average number of cigarettes smoked per day. There was a statistically significant difference between the average number of years that participants had smoked (Bronx: 29.0 years vs. Kenya: 22.14 years), but this is likely due to differences in the average age of the participants in each sample as mentioned above. There was a statistically significant difference in the number of quit attempts in each sample – higher proportions of the sample from the Bronx reported higher numbers of quit attempts compared to the proportion of participants from Kenya, especially in the range of 6-10 quit attempts (16.7% in the Bronx vs. 2% in Kenya). The median length of a quit attempt in Kenya was one week (0.25 months) and the median quit attempt length in the Bronx was 3.5 months. Additionally, there was one type of quit attempt that had a statistically significant difference between samples: more people from the Bronx (38.3%) tried some form of nicotine replacement therapy to quit cigarette use compared to people in Kenya (8%).

Self-Efficacy in the Kenya Sample versus the Bronx Sample

Table 21 shows the results of t-tests examining differences between samples on the total mean scores and mean scores of specific test items on Velicer's Self-Efficacy/Temptation Scale.

A confidence interval of 99% was used to correct for familywise error. There was a difference in mean total scores, as the mean total score for the Kenya sample was six points higher than the mean total score of the Bronx sample although this difference did not meet statistical significance ($p = 0.075$). In terms of individual items, there were significant differences in average scores on six out of the twenty questions (30% of the items) at the $p < 0.05$ level. Participants from Kenya reported higher levels of temptation (and therefore lower levels of self-efficacy) compared with participants from the Bronx when at a bar or cocktail lounge having a drink ($p < 0.001$), when desiring a cigarette ($p < 0.001$), when with a spouse or close friend who is smoking ($p = 0.001$), when the participant sees someone smoking and enjoying it ($p = 0.033$), when the participant is craving a cigarette ($p < 0.001$), and with friends at a party ($p < 0.001$). While participants from Kenya did report higher levels of temptation on certain items, the overall results suggesting that the participants from Kenya reported higher levels of temptation in situations where smoking is possible is not definitive.

Self-Concept in the Kenya Sample versus the Bronx Sample

Table 22 shows the results of t-tests examining differences between samples on mean scores of specific test items in Shadel, Mermelstein & Borelli's Smoker and Abstainer Self-Concept Questionnaire. A confidence interval of 99% was used to correct for familywise error. Out of the nine items, there were differences between samples on three of the questions that were significant at the $p < 0.05$ level (33.3% of the items). Participants from Kenya, on average, reported higher levels of identification with three items on the scale (see Table 22), all pertaining to participants' self-concepts as abstainers, either currently perceived or imagined in the future. These results suggest that participants from Kenya may be more able to see themselves as nonsmokers even as they currently smoke cigarettes.

Locus of Control in the Kenya Sample versus the Bronx Sample

Table 23 shows the results of t-tests examining differences between samples in mean scores of specific test items in Shuter et al. (2012)'s version of Donovan & O'Leary's Drinking-Related Locus of Control Scale. A confidence interval of 99% was used to correct for familywise error. Participants in Kenya also had significantly higher average total scores than the participants in the Bronx (M = 105.24 vs. M = 88.82, p = 0.001). Out of the twenty-five items, there were differences between samples on ten of the questions (40% of the items) significant at the $p < 0.05$ level, which suggest that if using the previously-validated three subscales, participants in Kenya endorse higher levels of external locus of control and fate/chance in locus of control, as well as lower levels of internal locus of control (see Table 23 for specific items).

Exploratory Aim 2 Results

Twenty-four individuals participated in the three focus groups. Focus groups were tape-recorded and then transcribed by an outside transcription service. A codebook was created in the fall of 2019 that identified six overarching themes with thirty-eight subthemes (see Appendix B). Two coders went through the focus groups and coded the transcripts, and the coding from each coder was inputted into NVivo 12, where queries were run to determine the number of times each theme was mentioned. The overall unweighted kappa was 0.44, which indicated moderate interrater reliability. The interrater reliability was likely low due to differences between the coders (one coder would code larger chunks of conversation), which was especially important because due to the conversational nature of the focus groups, coding would often include several participants in conversation around one theme, which, depending on the coder, would be coded individually or together into one code. Table 24 shows a breakdown of how many times each

subtheme was coded in each transcript, as well as the total number of times the subtheme was coded. Below are the results of the focus groups, divided by theme. Each theme is presented below with illustrative quotes and a summary of the findings (see also Tables 24-30).

Theme One: HIV (Table 25)

> "For me when I take my HIV medication well, I have good appetite for food and I take alcohol, I usually do not have any health problems, not even a cough, I only go back to the facility after eight months for my medication refill. But when I have projects to do so I may not drink, I rarely finish two months before having headaches, joint aches along other illness. During the time I'm not stressed up and I take alcohol my body is always okay."
>
> (Participant, Focus Group 2)

Surprisingly, HIV was not discussed frequently in any of the three focus groups. Subthemes of diagnosis, symptoms, achieving remission, psychological impact of HIV, and social support had zero coding events. The vast majority of the coding was related to HIV and comorbid health conditions, which included diagnoses such as asthma and tuberculosis, as well as physical symptoms including chest pain, congestion, coughing, nosebleeds due to weakened blood vessels, pain in the eyes, cavities in the teeth, and decreased libido. One participant mentioned having a stroke, but it was not clear if the stroke was related to HIV or smoking – the participant discussed being unable to smoke cigarettes after the stroke because of difficulty using their mouth but mentioned beginning to smoke again after recovering from the stroke.

Theme Two: General Tobacco Use (Table 26)

> "Maybe when you get to adolescence stage you feel like you are now an adult, during this age a person feels like it is right to smoke cigarettes. You always see yourself as an adult and you can smoke, that also contributes."
> (Participant, Focus Group 1)

General tobacco use was one of the two most-frequently mentioned themes, along with addiction. Participants cited many reasons for smoking, including feeling more like an adult (or feeling "older"), smoking for fun socially or with friends, social pressure, cravings, boredom, stress/anxiety or mood, increasing the high from other drugs (such as heroin), smoking because of exposure to other substances (like alcohol or khat), environmental triggers, preventing symptoms of withdrawal, routine, and out of interest ("because we wanted to"). While participants did not frequently discuss the psychological impact of smoking, they found that the act of smoking brought relief after feeling "psychologically disturbed" ("you feel your mind has come back"). Participants explained that they had frequent encounters with providers about smoking where doctors provided education related to the health risks of smoking (including side effects and interactions with medications for TB and HIV), and that participants were aware that they did not follow their providers' recommendations to stop smoking.

In terms of quitting smoking, participants reported feeling motivated to quit smoking but felt that quitting was a struggle. In fact, participants in the second focus group discussed how they felt that the bupropion trial in the parent study was "the solution" for their difficulties in quitting smoking:

> "I would say the way [Participant 2] has said, nobody was forced to come to this session. It was voluntary and we came because we wanted to know how we can be able to quit cigarette smoking. So it is for you (the researchers) to find a way

that can help us quit the cigarette. Talks alone may not be sufficient since we have

received information from the radio, television, churches, chiefs but it did not

yield. The solution is for you to get us medication."

(Participant 4, Focus Group 2)

Participants cited several reasons for wanting to quit, including health risks, being on

medications that interact with tobacco, and the financial burden. Participants also cited several

barriers to quitting, including the environment and stress, addiction and cravings (especially to

curb cravings for heroin), and social norms. While many participants describe the decision to

quit as "starting from the individual" and that continuing to smoke was a matter of "willpower,"

other participants also explained that there were systemic issues that prevented people from

quitting smoking:

There is no smoker who will be told to stop smoking and they stop smoking

unless there is something (another reason to make them stop) no one else will help

smokers except the government by banning companies that manufacture

cigarettes. If they are in the market and we are told not to smoke it will still be

smoked while in hidden places, the way people hide and smoke bhang.

(Participant 6, Focus Group 2)

Participants had mixed responses regarding priority of quitting – however, it is important to note

that all of these participants chose to be part of a smoking cessation study, which may have led to

a self-selecting sample. In terms of frequency of quit attempts, consistent with the data gathered

from the structured interviews, participants reported either having tried to quit once or twice, or

having never tried to quit. Participants reported a wide range of longest quit attempts, ranging

from several days to up to five years. Some participants said that their quit attempts were

voluntary, while others had to quit smoking due to lack of availability of tobacco (several explained that while they were in prison, they had to stop smoking, one for four years, but began smoking when released from prison). Participants reported that the primary ways they previously attempted to quit were cold turkey, reducing the number of cigarettes smoked per day, using menthol-flavored candy, and problem-solving in advance to avoid situations with smoking (including avoiding people who smoke, avoiding places where they could smell cigarette smoke and be tempted, or not bringing a lighter so they cannot light the cigarette). However, the participants frequently expressed hope that bupropion would help them quit smoking ("I have faith that the drug will help us, it will be our cure."). Notably, e-cigarette use was not mentioned frequently as a method of quitting ("I was told I could quit within two weeks but I did not manage because I was not so sure if the method would work.").

Theme Three: Tobacco Use and HIV (Table 27)

> "I have to say that cigarettes make these medications, these ARVS that I use...not to work effectively. Smoking every now and then… and I'm taking medication daily…it has effects. I think if I quit …at least I will see the effectiveness of these drugs."
>
> Participant, Focus Group 3

For participants who did not see a relationship between tobacco use and HIV, they stated that that they did not notice any side effects from smoking affecting their ARV effectiveness ("my blood has been checked so many times and the [CD4] count has neither increased nor decreased"). Those who did believe there was a relationship between tobacco use and HIV cited several different kinds of relationships, including smoking affecting the effectiveness of ARVs, smoking compromising the immune system for fighting HIV, and making the body work less

effectively, leading to other health outcomes. Interestingly, in terms of frequency of participants saying they did see a relationship between HIV and tobacco use and participants saying they did not see a relationship between HIV and tobacco use, the number of comments was fairly even (there were ten comments related to believing there was no relationship and twelve comments related to believing there was a relationship). When discussing other substances in relation to HIV and ARVs, heroin was most frequently cited, followed by bhang, alcohol, and cigarettes. Several participants said that when they began ARVs, they were told to reduce substance use, and found that quitting cigarettes was the most difficult. Participants said that providers frequently counseled them about smoking making ARVs less effective.

Theme Four: Addiction (Table 28)

> "The cigarette urge, let's say is like nicotine. It is said that cigarette is made with so much nicotine. You see there are women in case they have not taken tea they do not feel stable, they try their best to see how they will get the tea, for this nicotine it is also like after somebody taking alcohol they have to drink again few tots the next morning to be able to recover from the hangover, you know before a person does this they may not be able to do anything."
>
> (Participant, Focus Group 2)

Addiction was the second of the two most frequently coded themes. Participants describe the cravings as deeply physical – they explain that "smoking becomes a person [smoking becomes part of you]" and that "for an addict, the moment you stay for a few minutes you realize the body is missing something." Participants explain that the cravings are intense and severe enough that participants who attempted to quit reported relapsing. Participants also reported experiencing symptoms including dizziness, headaches, mental fog ("you feel like your mind is

blocked") from withdrawing from tobacco, and participants also reported using cigarettes as a way of coping with heroin withdrawal ("instead of smoking heroin I decide to smoke a cigarette as a way to kill the heroin urge").

Participants discussed how smoking is related to certain parts of their routine, including waking up in the morning, cues from meals, during work or on break from work (participants said that the nature of their jobs would influence whether they needed to wait until a designated break to smoke, although some participants said that they would smoke during their work hours), and going to bed to help with sleep. Participants cited a number of environmental triggers for wanting to smoke, including smelling smoke, seeing others smoke around them, boredom (being "idle"), times of day, feeling stressed, and even weather (several participants noted that they felt the need to smoke when it was cold or raining outside). They especially noted the social nature of smoking, explaining that others frequently offer cigarettes ("there are people who smoke cigarettes but they don't purchase it, they are given by others"), and that one way to reduce smoking is to avoid other people who smoke.

In terms of addiction to other substances, participants said that they experienced addictions to heroin, alcohol, khat, and bhang most frequently. They also noted several reasons for using tobacco in addition to other substances, including to increase the highs from other substances, or to replace an addiction ("to kill the heroin urge"), and to help with symptoms of withdrawal. One participant noted that addiction with substances in addition to tobacco, including khat or alcohol, was "like adding petrol on fire," because using other substances makes them smoke more cigarettes.

Theme Five: Mental Health (Table 29)

"I wanted to say for some people it is depression that causes them to start

smoking cigarettes… when they are at work they have peace but when they come

home every time there are issues, you find before they get to the house they hide

somewhere and smoke a cigarette…. for others its depression that causes them to

smoke."

(Participant 5, Focus Group 1)

Interestingly, participants did not discuss mental health frequently outside of the context

of using cigarettes to cope with stress. Participants did refer to having "thoughts" that were

stressful, in addition to external stressors that would contribute to smoking, but the only other

instance referring to mental health was that depression could contribute to smoking. There was

no mention of diagnosed mental health issues or psychotherapeutic treatment, including

psychotherapy and psychopharmacology.

Theme Six: Social and Interpersonal Problems (Table 30)

"There are people who smoke cigarettes but they don't purchase it, they are given

by others, they may smoke so many cigarettes but they don't buy, they sit next to

friends who smoke so they keep sharing with him, this one shares the next friend

also shares. Such a person can smoke more cigarettes than you who purchases

your own cigarettes."

(Participant, Focus Group 1)

Participants frequently described smoking as a social norm – smoking norms were often

the reason participants started smoking as children (either through family at home or peers at

school), and they are also environmental triggers for smoking as adults (both at work and in

social situations). Participants often talked about the social nature of smoking as well.

Participants talked about going to designated areas for smoking and talk ("story tell"). They also noted that people are very generous with cigarettes ("you can find someone denying you bus fare but will buy you cigarette") and there is a social element to passing cigarettes in a circle. Notably, the frequency of comments regarding stigma for smoking and stigma for not smoking were fairly even (ten comments regarding stigma for smoking and thirteen comments regarding stigma for not smoking). Additionally, participants experienced stigma for not smoking in childhood and adulthood, but only experienced stigma for smoking as adults.

Culture and religion were not frequently discussed, but notably, one participant said that a pastor was one of the reasons they tried to stop smoking ("he told me to get saved… he gave me a word"), and another participant expressed faith that the bupropion would help with smoking cessation ("I have very big faith before God that it will be our cure"). Participants also mentioned that they received education often regarding the health risks of smoking through their providers, through packaging, and through the government.

Participants also expressed frustration because they continue smoking despite knowing the health risks ("it is for you [the researchers] to find a way…talks alone may not be sufficient since we have received information from the radio, television, church, chiefs but it did not yield."). Finally, participants also often discussed the financial burden of smoking as it "increases poverty," saying that they often make choices between purchasing food or cigarettes ("when I'm planning for the household shopping I also factor in my cigarettes" and "that moment when I have no money, I would rather go to the shop and ask for cigarettes").

CHAPTER IV

Given the increased rates of cigarette smoking in developing countries, such as Kenya, and the geopolitical situations surrounding those increased rates of cigarette use (Braithwaite et al., 2014; Hu & Lee, 2015; Boseley, 2017), it is important to conduct research to best understand how to address smoking cessation in such populations. This research is especially important for subgroups of people who experience greater consequences of smoking such as PLWHA. Smoking by PLWHA can compound health risks significantly (Clifford et al., 2005; Crothers et al., 2009), thus studying smoking among PLWHA in developing countries is necessary to understand how to address smoking cessation in such populations to reduce risks and health outcomes.

Importantly, because it is difficult to address the systemic factors that play a role in smoking rates, such as the reach of the tobacco industry and its relationship to the role in poverty, the laws and regulations of tobacco in developing nations, and the industry's fight to prevent countries from restricting its influence, it is important to work at an individual level to help those who do smoke to have the best chance of cessation possible. From a clinical perspective, one of the ways that we can intervene to improve smoking cessation is by identifying variables related to smoking and quitting behavior that are within our clients' control and can be targeted in interventions, such as how individuals feel about their smoking and their ability to quit.

Many of the self-report measures that are used to examine aspects of smoking behavior that could be targeted in cessation efforts were developed and validated in developed countries such as the US. It is important to examine the specific differences in how we measure intangible constructs in developing countries. This study was the first to examine the psychometric

properties of measures of smoking-related self-efficacy, self-concept, and locus of control in a sample from in a developing country (in this case, Kenya), along with examining qualitative data that may give researchers insight into the specific smoking behaviors, attitudes, and hopes for quitting for people in Kenya. This information is critical in beginning to understand these differences between PLWHA who smoke in Kenya and the United States.

Findings from this study showed that there was variation in the similarity of results from Kenya in comparison to previous results, mostly from the US. With regard to Aim 1, the Self-Efficacy/Temptation Scale were the most similar to its previous model as proposed by Velicer et al. (1990). The items on the Self-Efficacy/Temptation Scale corresponded to the three-factor model for the sample of adults in Kenya. These three factors included a positive/social factor, a negative/affect factor, and a habit/addiction factor. The positive/social factor included situations where someone may feel positive ("when I am happy and celebrating"), including social situations ("over coffee or tea while talking and relaxing," "with friends at a party," or "when I see someone smoking and enjoying it"). On the other hand, the negative/affect factor included specific negative emotions ("extremely depressed," "extremely anxious," "very angry," or "frustrated"), as well as the reasons someone may feel these negative emotions ("when I wake up in the morning and face a tough day," "when I would experience an emotional crisis," or "when there are arguments and conflicts"). Interestingly, the third factor (habit/addictive) has no emotional component associated with it ("when I am desiring a cigarette" or "when I first get up in the morning"). This neutrality in emotion may be beneficial because adding an emotional component to a factor about addiction may lead to judgments about addictions (which are usually negative and can reinforce self-stigma).

With regard to Aim 2, the Smoker and Abstainer Self-Concept Questionnaire had a somewhat similar factor structure in the sample from Kenya to the one proposed by previous research in the US (Shadel, Mermelstein, & Borrelli, 1996; Shadel & Mermelstein, 1996). While the smoker self-concept factor remained largely similar, the abstainer self-concept factor was found to have two separate factors in this analysis – perceived current non-smoker self-concept and imagined future non-smoker self-concept (which can overlap with the "possible self" suggested by Markus & Nurius, 1986).   Notably, the one item that was removed from the initial model ("others view smoking as part of my personality"), which was part of the smoker self-concept in Shadel & Mermelstein's (1996) previous model, loaded onto both smoker self-concept and imagined future abstainer self-concept, which are two somewhat opposing concepts. Additionally, it was also the only question that asked participants to consider how others viewed their smoking, rather than how they viewed their own smoking. This item is interesting as it poses the question whether the opinions of others matter when someone considers their smoking identity. This study's findings in relation to this study are mixed, as removing this question from the analysis suggests the opinions of others are not as important as the opinions of the participants, but the qualitative data (from Exploratory Aim 2) indicated that people do feel judged about their smoking. In fact, the qualitative data showed that there were similar number of comments where participants felt stigma due to smoking and stigma due to not smoking. It is possible, however, that participants felt judged about their smoking, but not to the degree where it would affect their sense of identity.

The comparison data between the Kenya sample and the Bronx sample in Exploratory Aim 1 also showed an interesting contradiction in the results of the self-efficacy and self-concept measures between the Kenyan sample and a sample of PLWHA in the US. Participants in the

Kenya sample, on average, reported higher levels of temptation (indicating a lower level of self-efficacy), but lower levels of smoker self-concept and higher levels of abstainer self-concept, compared to their counterparts in the Bronx sample. These differences were not statistically significant but, these were two separate studies (i.e., not one study designed to compare the two samples) and the findings suggest an avenue for future research. The contradiction of having less self-efficacy (and perhaps even less confidence) in smoking cessation, but a stronger identification as non-smokers, might say something about how the participants in Kenya view smoking in the framework of their identities, which may influence their efficacy in quitting.

With regard to Aim 3, the results of the adaptation of the Drinking-Related Locus of Control Scale (Donovan & O'Leary, 1978) were the least similar to the hypothesized expectation. Traditionally, personality psychology posits that there are two locus of control factors – internal and external, while health psychology suggests further breaking down the external locus of control into two separate factors ("powerful others" and luck or chance), bringing the total to three locus of control factors (Rotter, 1966, Wallston et al., 1978). The fact that there was only one factor in this set of twenty-five test items is not a concern in itself, but there are several challenges that come out of these results. First, out of the twenty-five original items that loaded onto three factors, seventeen of them loaded onto one factor, which is quite large compared to approximately eight items per subscale in the previous research. This issue leads to the second issue, which is that the seventeen items came from three conceptually discrete factors and were combined into one factor in this analysis. This conclusion is supported by two complementary pieces of evidence – both the number of items kept in the scale and the number of items removed from the scale come from each of the subscales approximately equally (about 5-6 items and 2-3 items, respectively). This suggests that in Kenya, different aspects of

locus of control may not be culturally relevant to the participants and, if these results generalize, to the larger population of Kenya. However, more research would be needed to confirm this hypothesis.

In all three measures, it is important to consider whether there are also cultural or language-related challenges with translating concepts that may have impacted the results. It is possible that a Western concept does not have an equivalent concept in Kenya and vice-versa. The most significant example occurs in Aim 3, which examined the locus of control measure. While the past analyses suggested a three-factor model of internal locus of control, external locus of control, and fate/chance (Wallston et al., 1978), the current analysis showed an eight-factor model. It is possible that one explanation of this model is due to cultural differences between Kenyan culture and Western culture, and that there are either different cultural interpretations of loci of control, or that the loci of control themselves may be completely different in Kenya than in Western countries. Another example of this was in the focus group data, when participants reported "evil-mindedness" as a barrier in their ability to quit smoking. Similarly, there may be other instances where cultural differences may have an impact on the data – as noted previously, participants in the Kenya sample reported lower levels of self-efficacy but also higher levels of identification with being non-smokers.

In terms of the qualitative data, it was hypothesized that the focus group interviews would provide complementary data that would show insight into participants' self-evaluations of their abilities to quit smoking. For the most part, the focus groups did not address the specifics of self-efficacy, self-concept, or locus of control, likely because the questions used in the focus groups did not address them explicitly. However, the most notable finding in regard to self-evaluations was that participants felt an overarching sense of helplessness regarding addiction

and the ability to quit smoking. This helplessness was found both in the physical aspect of addiction, including cravings, needing to smoke to prevent withdrawal, and environmental triggers, as well as a larger psychosocial aspect of smoking. One participant explained that "we have received information from the radio, television, churches, chiefs, but it did not yield" and that despite this education, people continue to smoke.

This sense of helplessness is also consistent with the geopolitical situation with the tobacco industry. The tobacco industry has significant power and influence worldwide and has fought for smoking laws and regulations to loosen in developed and developing countries alike. The Tobacco Control Act in 2007 was initially considered ineffective, and later led to a new set of measures (Tobacco Control Regulations) in 2014, but British American Tobacco (BAT) filed a legal case against the Ministry of Health in Kenya that suspended the laws from being implemented for five years. In fact, BAT's tactics have been called "a form of modern-day colonization," (Hanspal, 2021). The Tobacco Control Research Group published two reports in 2021 detailing how BAT made a number of payments (236 payments totaling $601,502USD, although the reports note that this statistic might underestimate the number of payments and amount of money), and how these payments are linked to all aspects of the tobacco industry, ranging from production to policy, and also circumvent the WHO-FCTC framework's regulation to "protect the public health policies related to tobacco control from commercial and other vested interests of the tobacco industry" (Rowell, Alviram, & Gilmore, 2021; Rowell, Gilmore & Jackson, 2021). African countries and people are already at a disadvantage as well, because of the history of colonization. Carol McGruder, the founder of the African American Tobacco Control Leadership Council (AATCLC) stated that "because of our status in the world, because of the enslavement of African people, we are so much more vulnerable than most people," and

Andy Rowell, a researcher at the University of Bath, also points out that "many of the senior decision-makers are white…the control structure goes back to London, and they have a monopoly in many African countries, and they want to exploit the continent to drive growth" (Hanspal, 2021). Taken together, the pre-existing history of African colonization leading to vulnerability in African populations, as well as the conscious business choices of the tobacco industry, make significant contributions to the messages provided to increase tobacco production in Africa, to the exposure to tobacco products for consumers in Africa, and the difficulties in creating policies to regulate the industry for the safety of producers and consumers. As a result of all of these factors, the findings in the focus group regarding the feeling of helplessness in quitting smoking is not surprising.

Perhaps one of the most important findings that came from this study, however, was the hope that people who participated reported in regard to smoking cessation. While participants in the focus group interviews expressed their doubts about their abilities to quit smoking individually, they expressed a great deal of hope and faith that with the help of the research team and the bupropion, smoking cessation would be possible. This is an important piece of information, because without participants' hope and interest in smoking cessation, progress would be limited, as it is difficult for participants to quit smoking without hope, interest, or even consent. It is important to note, however, that because of the nature of participating in research studies, the sample is likely to be self-selected, and as a result, the sample may not represent the full population in terms of how interested or hopeful they are regarding smoking cessation.

To summarize, the factor analyses in Aims 1-3 showed that measures have a wide range of degrees of similarity between cultures. While Aim 1 (self-efficacy) had a similar factor structure to the one found in previous research, Aim 3 (locus of control) had a very different

factor structure. It is possible that the differences between models are related to cultural differences across populations, and as a result, it is important to examine the psychometrics of measures when they are used in samples across different populations, as they can vary as much as the cultures they are examined in. The recognition that culture can have an impact on the psychometrics of measures is important when examining smoking cessation measures, such as those used in this study, as researchers may need to interpret and apply the measures differently depending on the population and culture. Just as cultures are unique, so are each culture's smoking norms and cessation needs, and this needs to be reflected in smoking cessation research and efforts.

Research/Clinical Implications

The results from this study have a number of research and clinical implications. From a clinical perspective, this study highlighted the challenges PLWHA in Kenya face when trying to quit smoking. There are some unique challenges that participants in Kenya and other countries have faced related to the influence of the tobacco industry that have made smoking commonplace and quitting extremely difficult, and loopholes in laws that are taken advantage of to such a large degree that they subvert the intentions of anti-smoking legislation. As a result, it is likely that the clinical work involved with helping with smoking cessation in Kenya will need to connect to policy work as well, because creating policies that lessen the hold that tobacco has over the Kenyan population will likely improve the chances of people quitting.

From a research perspective, this study shows how measures may not adapt to other populations as simply as using the measure exactly as it was developed. The study highlighted the journey measures usually take as they are applied to different populations – they are often created and validated in developing or Western countries, and then translated and administered to

participants in developing countries with the potential of interpreting them in the same way as they are interpreted in developed countries. This study, however, showed that the journey is more complex – it is important to examine the cultures of the people using the measures through quantitative and qualitative data alongside administering the measures, as scales used to assess constructs may mean different things for different groups. While it is unlikely that developing new scales for each study or population is feasible, it is important to examine the differences and acknowledge how these differences may affect research study results. Examining the complexities of cultures in relation to psychometrics, while challenging, can also provide researchers with richer and more informative data that will lead to more useful results.

Future Research Directions

The results of this study can lead to several directions of future research. First, because of the limitations in determining convergent validity using scales that conceptually overlapped and not validated (the three scales were examined in relation to each other), it is difficult to determine the true convergent validity. Ideally, using already validated measures that examine similar concepts using validated measures that examined conceptually similar concepts (convergent validity on a scale for self-efficacy would use another scale for self-efficacy specifically, instead of another type of self-evaluation). As a result, future research can specifically include measures that examine the same concept instead of concepts that merely overlap, as a way to better examine convergent validity.

Second, developing focus groups for PLWHA who smoke that have prompts designed to address the hypotheses about self-evaluations in regard to smoking may lead to more understanding of the results of the three variables that were examined through factor analyses presented earlier. For example, these focus groups can be designed to try to help researchers

understand why the locus of control scale had eight factors. These focus groups can also be designed to improve our knowledge about the other self-evaluation measures including how these concepts are related to barriers to quitting and success quitting.

Another important direction for future research can be in regard to developing procedures that may be helpful when using measures in different populations. Because this study highlighted the importance of examining cultures alongside the measures, future research may find that creating a uniform system or protocol that can be used to identify and examine differences in measures that arise between populations.

<div align="center">**Limitations**</div>

The results of this study should be considered in the light of several important limitations. The first limitation is that the results of this study, which was conducted in Kenya, may not apply to other developing countries. Braithwaite et al. (2014) explain that other developing countries include areas in South Asia and the Middle East as well as Africa. Furthermore, African countries are also likely to have different cultures and norms from each other, limited the potential generalizability of results from one African country to another African country. Additionally, the data collected in the Bronx, New York (used in Exploratory Aim 1) was collected more than ten years before the data collected in Kenya as part of a different study, which means that while these two studies have some parallels that allowed the comparisons presented earlier, they were not designed to be comparable.

One major limitation is the lack of data that could be used to test the validity of the three variables of interest. There are two main reasons for this limitation. First, because the sample size in this analysis is between 47-50 participants (and because some participants did not complete every question in some of the measures and their results were removed for each

incomplete measure), the effect sizes may not be accurate or generalizable to a larger population. As a result, it is difficult to assess the degree of correlation between measures as well as whether the measures are significantly related to each other. Second, in terms of convergent validity, the content of the measures themselves have not been validated in this sample with known similar measures. In an ideal psychometric study design, the same participants would be given both the new measure and an already-validated existing measure that assesses the same construct. In the practice of this study, participants were only given the measures that need to be validated (self-efficacy, self-concept, and locus of control) but did not receive measures to complete that assessed the same constructs as a control. While validating measures on a sample that has never been studied before contributes greatly to innovation, comparing multiple measures that have not been validated against each other on the premise that they might be similar constructs (all pertaining to self-evaluation) does not prove convergent validity with known measures.

Another major limitation is related to the sample itself. Because the sample of participants for the parent study were recruited from methadone clinics, the sample is not likely to represent the population of PLWHA in Kenya. This is due to two reasons. First, because participants are likely to hear different views related to their identities with addiction (either "once an addict, always an addict" or that one's identity should not be defined by their history with addiction), they are likely to be motivated differently to quit smoking, which may skew the results. Second, because participants are focused on quitting methadone, they may not be focused on quitting tobacco.

Finally, there were some significant challenges with the dataset related to gathering and interpreting the qualitative data from the focus groups. First, because the transcriptions of the focus groups omitted identifying participant information, participant characteristics were unable

to be obtained as it was not possible to match participants in the focus group with their demographic information. It is important to note that the participants in the three focus groups (total N for all focus groups = 24) were different than the participants who gave the structured interviews, from whose data the scale validations in the three main study aims were analyzed. Second, because the focus groups were tape-recorded and then transcribed by an outside transcription service, the transcripts do not consistently provide participant numbers in the transcripts, which means that for the majority of the transcripts, it is not clear which participant said what. Therefore, it was not possible to count how many participants mentioned each theme, as was done in previous qualitative examples. As a result, Table 24 shows a breakdown of how many times each subtheme was coded in each transcript, as well as the total number of times the subtheme was coded. Lastly, the focus group prompts were created to answer specific questions (see Appendix A) and were not developed with the goal of examining the specific hypotheses for this study including how specific self-evaluations (e.g., such as self-efficacy, self-concept, and locus of control; variables examined in Aims 1-3) related to smoking behavior.

Conclusions

Taken together, the results of this study provide some insight into the smoking beliefs and attitudes of PLWHA in Kenya, where the information is so new that the measures needed to be validated as a first step before using these measures to inform cessation efforts. On a larger level, these results are important because understanding how people view smoking may help clinicians develop interventions that target appropriate needs while taking into account cultural and individual differences. Developing these interventions is especially imperative given the challenges in the geopolitical situation with the tobacco industry, which has a history of creating consumers out of their producers, and using powerful resources to deregulate tobacco at the

health and safety of the people. As one of the focus group participants noted, "it is for you [the researchers] to find a way that can help us," and in creating interventions, we may be able to have a larger impact that can lead to policy change. While the participant was referring to the need for the researchers to help participants in this study quit smoking because others have not helped, this statement is also more generalizable. It is our job as researchers to recognize the complexities in people and cultures, and how differences in culture can influence test constructs and measures (for smoking cessation or other health-related areas). Furthermore, it is also our job to apply the lessons we learn about these complexities to our work. In doing so, we can improve the efficacy of interventions for a range of individuals for smoking cessation, as well as for other significant health behaviors and health conditions.

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Tables

Table 1. Demographics of Kenya Sample

	N (%)/M (SD) (Total N=50)	Min-Max (range of scores)
In what language was this interview completed?		
English	7 (14.0%)	
Swahili	36 (72.0%)	
Both English and Swahili	7 (14.0%)	
Age (years)	38.45 (9.36)	20 – 57
Gender		
Male	34 (68.0%)	
Female	16 (32.0%)	
Marital Status		
Single	9 (18.0%)	
Married/living with partner	24 (48.0%)	
Separated	14 (28.0%)	
Divorced	1 (2.0%)	
Widowed	2 (4.0%)	
Race/Ethnicity		
African	48 (96.0%)	
Asian	1 (2.0%)	
Somali	1 (2.0%)	
Religion		
Protestant (e.g. Baptist, Pentecostal, Anglican)	17 (34.0%)	
Catholic	24 (48.0%)	
Jewish	0 (0.0%)	
Hindu	0 (0.0%)	
Muslim	9 (18.0%)	
Buddhism	0 (0.0%)	
No religion	0 (0.0%)	
Education		
Some primary education	14 (28.0%)	
Primary school	10 (20.0%)	
Some secondary education	11 (22.0%)	
Secondary education	9 (18.0%)	
Some college education	1 (2.0%)	
College education	3 (6.0%)	
No education	2 (4.0%)	

Employment Status

Working full-time outside the home	30 (60.0%)
Working part-time outside the home	11 (22.0%)
Working full-time from home	1 (2.0%)
Working part-time from home	1 (2.0%)
Unable to work (disabled)	0 (0.0%)
Retired	0 (0.0%)
In school	0 (0.0%)
Unemployed	8 (16.0%)

Housing Situation

Homeless	0 (0.0%)
Stable housing (house, apartment)	47 (94.0%)
Transitional (staying with friends or family)	3 (6.0%)

24,000KSh –
300,000KSh

Monthly Household Income[1]

20,000KSh – 39,999KSh ($182.98 – $365.96)	3 (6.0%)
40,000KSh – 59,999KSh ($365.97 – $548.94)	5 (10.0%)
60,000KSh – 79,999KSh ($548.95 – $731.52)	9 (18.0%)
80,000KSh – 99,999KSh ($731.93 – $914.90)	3 (6.0%)
100,000KSh – 119,999KSh ($914.91 – $1,097.89)	3 (6.0%)
120,000KSh – 139,999KSh (1,097.90 –$1,280.87)	6 (12.0%)
140,000KSh – 159,999KSh ($1,280.88 – $1,463.85)	6 (12.0%)
160,000KSh – 179,999KSh ($1,463.85 – $1,646.83)	0 (0.0%)
180,000KSh – 200,000KSh ($1,646.84 – $1,829.82)	7 (14.0%)
200,000KSh or more ($1,829.83 or more)	1 (2.0%)
Not reported	7 (14.0%)

Geography[2]

Bungoma County	1 (2.0%)
Kakamega County	1 (2.0%)
Kiambu County	3 (6.0%)
Kitui County	1 (2.0%)
Laikipia County	1 (2.0%)
Machakos County	3 (6.0%)
Malaba County	1 (2.0%)
Mombasa County	1 (2.0%)
Muranga County	4 (8.0%)
Nairobi County	27 (54.0%)
Nakuru County	3 (6.0%
Narok County	1 (2.0%)
Nyandarua County	1 (2.0%)
Nyeri County	1 (2.0%)
Starehe County	1 (2.0%)

Members of household[3]
Spouse/Partner
    Yes   23 (46.0%)
        Smokes   12 (24.0%)
        Does not smoke   11 (22.0%)
    No   27 (54.0%)

Members of household[3]	
Spouse/Partner	
Yes	23 (46.0%)
Smokes	12 (24.0%)
Does not smoke	11 (22.0%)
No	27 (54.0%)
Mother	
Yes	4 (8.0%)
Smokes	0 (0.0%)
Does not smoke	4 (8.0%)
No	46 (92.0%)
Father	
Yes	2 (4.0%)
Smokes	0 (0.0%)
Does not smoke	2 (4.0%)
No	48 (96.0%)
Sibling (sister/brother)	
Yes	6 (12.0%)
Smokes	6 (12.0%)
Does not smoke	0 (0.0%)
No	44 (88.0%)
Children	
Yes	23 (46.0%)
Smokes	0 (0.0%)
Does not smoke	23 (46.0%)
No	27 (54.0%)
Roommates	
Yes	3 (6.0%)
Smokes	2 (4.0%)
Does not smoke	1 (4.0%)
No	47 (94.0%)

[1]*Household income is reported in Kenyan currency (KSh) and converted into American currency (USD)*
[2]*Participants were asked in what county they grew up*
[3]*Participants were asked to report whether they had other people, including parents, siblings, children, and/or roommates living with them (yes/no). If participant reported parents, siblings, children, and/or roommates living with them, they were asked a follow-up question about whether the person smoked (yes/no).*

Table 2. Kenya Sample Medical Demographic Information

	N (%)/M (SD) (Total N=50)	Min-Max (range of scores)
Years since HIV Diagnosis	6.48 (4.42)	0 – 17
Method of HIV Transmission		
Injection Drug Use	20 (40.0%)	
Heterosexual contact with an infected partner	16 (32.0%)	
Same-sex contact with an infected partner	0 (0.0%	
Transfusion	0 (0.0%)	
Unknown	11 (22.0%)	
Other (use of needles unrelated to drug use)	4 (8.0%)	
Antiretroviral medication use – ever	50 (100%)	
Antiretroviral medication use – current	50 (100%)	
Duration of antiretroviral medication use (years)	4.93 (3.58)	0.25 – 17.00
Hospitalized in the last 5 years[1]	9 (18.0%)	
Hospitalized in the last 1 year[1]	1 (2.0%)	
Diagnosis and treatment of other illness[2]		
Bacterial pneumonia		
Never	35 (70.0%)	
Past	15 (30.0%)	
Current (under treatment)	0 (0.0%)	
Current (not treated)	0 (0.0%)	
Tuberculosis		
Never	32 (64.0%)	
Past	18 (36.0%)	
Current (under treatment)	0 (0.0%)	
Current (not treated)	0 (0.0%)	
Cryptococcal meningitis		
Never	49 (98.0%)	
Past	0 (0.0%)	
Current (under treatment)	0 (0.0%)	
Current (not treated)	0 (0.0%)	
Not reported	1 (2.0%)	
High blood pressure		
Never	47 (94.0%)	
Past	1 (2.0%)	
Current (under treatment)	1 (2.0%)	
Current (not treated)	1 (2.0%)	
High cholesterol		

Never	50 (100.0%)
Past	0 (0.0%)
Current (under treatment)	0 (0.0%)
Current (not treated)	0 (0.0%)
Diabetes	
Never	50 (100.0%)
Past	0 (0.0%)
Current (under treatment)	0 (0.0%)
Current (not treated)	0 (0.0%)
Heart disease	
Never	50 (100.0%)
Past	0 (0.0%)
Current (under treatment)	0 (0.0%)
Current (not treated)	0 (0.0%)
Asthma	
Never	48 (96.0%)
Past	0 (0.0%)
Current (under treatment)	2 (4.0%)
Current (not treated)	0 (0.0%)
Other lung disorders (e.g. COPD)	
Never	48 (96.0%)
Past	2 (4.0%)
Current (under treatment)	0 (0.0%)
Current (not treated)	0 (0.0%)
Cancer	
Never	50 (100.0%)
Past	0 (0.0%)
Current (under treatment)	0 (0.0%)
Current (not treated)	0 (0.0%)
Depression	
Never	40 (80.0%)
Past	6 (12.0%)
Current (under treatment)	2 (4.0%)
Current (not treated)	2 (4.0%)
Anxiety/Panic	
Never	41 (82.0%)
Past	7 (14.0%)
Current (under treatment)	1 (2.0%)
Current (not treated)	1 (2.0%)

[1] *Participants reported if they had been hospitalized for any reason within the specified time frame*
[2] *Participants reported if they had been diagnosed and/or treated for the specified conditions*

Table 3. Medication Use, Substance Use, and Substance Use Treatment in the Kenya Sample

	N (%) (Total N=50)
Medication and Substance Use	
Anti-depressant medication	
Yes	29 (58.0%)
Prescribed by a doctor	3 (10.3%)
Not prescribed by a doctor	26 (89.7%)
Used within the last 30 days	5 (17.2%)
Not used within the last 30 days	24 (82.8%)
No	21 (42.0%)
Anti-anxiety medication	
Yes	36 (72.0%)
Prescribed by a doctor	3 (8.3%)
Not prescribed by a doctor	33 (91.7%)
Used within the last 30 days	6 (16.7%)
Not used within the last 30 days	30 (83.3%)
No	14 (28.0%)
Anti-psychotic medication	
Yes	28 (56.0%)
Prescribed by a doctor	0 (0.0%)
Not prescribed by a doctor	28 (100.0%)
Used within the last 30 days	3 (10.7%)
Not used within the last 30 days	25 (89.3%)
No	22 (44.0%)
Amphetamines	
Yes	1 (2.0%)
Prescribed by a doctor	0 (0.0%)
Not prescribed by a doctor	1 (100.0%)
Used within the last 30 days	0 (0.0%)
Not used within the last 30 days	1 (100.0%)
No	49 (98.0%)
Sedatives	
Yes	30 (60.0%)
Prescribed by a doctor	2 (6.7%)
Not prescribed by a doctor	28 (93.3%)
Used within the last 30 days	3 (10.0%)
Not used within the last 30 days	27 (90.0%)
No	20 (40.0%)
Painkillers	
Yes	40 (80.0%)
Prescribed by a doctor	13 (32.5%)
Not prescribed by a doctor	27 (67.5%)
Used within the last 30 days	14 (35.0%)
Not used within the last 30 days	26 (65.0%)

No   10 (20.0%)

Marijuana

 Yes   36 (72.0%)

  Prescribed by a doctor   0 (0.0%)

  Not prescribed by a doctor 36 (100.0%)

  Used within the last 30 days 22 (61.1%)

  Not used within the last 30 days 14 (38.9%)

 No   14 (28.0%)

Hashish

 Yes   10 (20.0%)

  Used within the last 30 days 0 (0.0%)

  Not used within the last 30 days 40 (100.0%)

 No   40 (80.0%)

Cocaine

 Yes   17 (34.0%)

  Used within the last 30 days 0 (0.0%)

  Not used within the last 30 days 17 (100.0%)

 No   33 (66.0%)

Hallucinogens

 Yes   0 (0.0%)

  Used within the last 30 days 0 (0.0%)

  Not used within the last 30 days 0 (0.0%)

 No   50 (100.0%)

Heroin

 Yes   37 (74.0%)

  Used within the last 30 days 4 (10.8%)

  Not used within the last 30 days 33 (89.2%)

 No   13 (26.0%)

Caffeine

 Yes   19 (38.0%)

  Used within the last 30 days 9 (52.6%)

  Not used within the last 30 days 10 (47.4%)

 No   31 (62.0%)

Alcohol

 Yes   40 (80.0%)

  Used within the last 30 days 17 (42.5%)

  Not used within the last 30 days 23 (57.5%)

 No   10 (20.0%)

Methadone

 Yes   37 (74.0%)

  Prescribed by a doctor   37 (100.0%)

  Not prescribed by a doctor 0 (0.0%)

  Used within the last 30 days 36 (97.3%)

  Not used within the last 30 days 1 (2.7%)

 No   13 (26.0%)

Miraa/Khat

Yes	32 (64.0%)
Used within the last 30 days	15 (46.9%)
Not used within the last 30 days	17 (53.1%)
No	18 (36.0%)
PCP/Jet fuel	
Yes	13 (26.0%)
Used within the last 30 days	0 (0.0%)
Not used within the last 30 days	13 (100.0%)
No	37 (74.0%)

Treatment Program Attendance

Methadone Program

No Current or Past Treatment	13 (26.0%)
Current, Attend Occasionally	0 (0.0%)
Current, Attend Regularly	36 (72.0%)
Past, Completed	1 (2.0%)

Alcohol Treatment Program

No Current or Past Treatment	48 (96.0%)
Current, Attend Occasionally	0 (0.0%)
Current, Attend Regularly	0 (0.0%)
Past, Completed	2 (4.0%)

Mental Health Treatment Program

No Current or Past Treatment	49 (98.0%)
Current, Attend Occasionally	0 (0.0%)
Current, Attend Regularly	1 (2.0%)
Past, Completed	0 (0.0%)

Other Drug Rehabilitation Program

No Current or Past Treatment	43 (86.0%)
Current, Attend Occasionally	3 (6.0%)
Current, Attend Regularly	0 (0.0%)
Past, Completed	4 (8.0%)

Notes. Participants were asked whether they had ever used the listed substances (yes/no). Participants who reported using the substance (yes) were asked two follow-up questions: whether they had used the substance in the past 30 days (yes/no), and if applicable, if the substance had been prescribed by a doctor (yes/no).

Table 4. Kanya Sample Tobacco Use

	N (%)/M (SD)/Mdn [IQR] (Total N=50)	Min-Max (range of scores)
Type of Tobacco Used		
Cigarettes		
Yes	50 (100.0%)	
No	0 (0.0%)	
Chewing Tobacco		
Yes	2 (4.0%)	
No	48 (96.0%)	
Nasal Snuff		
Yes	2 (4.0%)	
No	48 (96.0%)	
Oral Snuff		
Yes	0 (0.0%)	
No	50 (100.0%)	
Bidis		
Yes	0 (0.0%)	
No	50 (100.0%)	
Hookah		
Yes	0 (0.0%)	
No	50 (100.0%)	
Pipe		
Yes	0 (0.0%)	
No	50 (100.0%)	
Cigar		
Yes	0 (0.0%)	
No	50 (100.0%)	
Average Number of Cigarettes Smoked Per Day	14.88 (12.43)	1 – 60
Current Frequency of Cigarette Smoking		
Every day	41 (82.0%)	
Some days	9 (18.0%)	
Not at all	0 (0.0%)	
Type of cigarette smoked most often in thE last 30 days		
Regular	46 (92.0%)	
Menthol	1 (2.0%)	
Sweet menthol	2 (4.0%)	
Not reported	1 (2.0%)	
Smoked light/mild/low tar most often in the last 30 days		
Yes	10 (20.0%)	
No	12 (24.0%)	
Not reported	28 (56.0%)	

Method of purchase

    Single or few sticks at a time   50 (100.0%)

    Whole pack   0 (0.0%)

Others who smoke in the home

    Yes   20 (40.0%)

    No   30 (60.0%)

Method of purchase		
Single or few sticks at a time	50 (100.0%)	
Whole pack	0 (0.0%)	
Others who smoke in the home		
Yes	20 (40.0%)	
No	30 (60.0%)	
Age participant began smoking	17.53 (4.83)	9 –30
Duration of smoking	22.14 (9.34)	1 – 44
Number of quit attempts		
None	15 (30.0%)	
1-5	22 (44.0%)	
6-10	1 (2.0%)	
11 or more	11 (22.0%)	
Not reported	1 (2.0%)	
Longest quit attempt (months)	0.25 [0.05, 2.50]	0.0175 – 48
Type of quit attempt[1]		
Unassisted		
Yes	31 (62.0%)	
No	8 (16.0%)	
Not reported	11 (22.0%)	
Nicotine replacement (patch, gum, spray)		
Yes	4 (8.0%)	
No	35 (70.0%)	
Not reported	11 (22.0%)	
Zyban or other antidepressant		
Yes	0 (0.0%)	
No	39 (78.0%)	
Not reported	11 (22.0%)	
Varenicline or Chantix		
Yes	0 (0.0%)	
No	39 (78.0%)	
Not reported	11 (22.0%)	
Group intervention		
Yes	0 (0.0%)	
No	39 (78.0%)	
Not reported	11 (22.0%)	
Individual counseling		
Yes	1 (2.0%)	
No	37 (74.0%)	
Not reported	12 (24.0%)	
Hypnosis		
Yes	0 (0.0%)	
No	39 (78.0%)	
Not reported	11 (22.0%)	
FTND Total Score[2]	5.37 (2.14)	0 – 9

[1]Participants were asked whether they had ever tried to quit smoking using this method, regardless of whether it was the participant's longest successful quit attempt.
[2]The Fagerström Test of Nicotine Dependence (FTND) is a standard measure to assess physical dependence on nicotine. Scores range from 0-10, with higher scores indicating greater physical dependence on nicotine.

Table 5. Self-Efficacy Numbered Items

Number	Item
1	At a bar or cocktail lounge having a drink
2	When I am desiring a cigarette
3	When things are just not going the way I want and I am frustrated
4	With my spouse or close friend who is smoking
5	When there are arguments and conflicts with my family
6	When I am happy and celebrating
7	When I am very angry about something or someone
8	When I would experience an emotional crisis, such as an accident or death in the family
9	When I see someone smoking and enjoying it
10	Over coffee or tea while talking and relaxing
11	When I realize that quitting smoking is an extremely difficult task for me
12	When I am craving a cigarette
13	When I first get up in the morning
14	When I first need a lift
15	When I begin to let down on my concern about my health and am less physically active
16	With friends at a party
17	When I wake up in the morning and face a tough day
18	When I am extremely depressed
19	When I am extremely anxious and stressed
20	When I realize I haven't smoked for a while

Source: Velicer WF, DiClemente CC, Rossi JS, Prochaska JO. Relapse situations and self efficacy: an integrative model. Addict Behav. 1990;15:271-283.

Table 6. Self-Efficacy Scale Inter-Item Correlations

	1	2	3	4	5	6	7	8	9	10
1										
2	0.059									
3	0.270	0.208								
4	0.234	0.051	0.446**							
5	0.131	0.354*	0.587**	0.224						
6	0.259	0.123	0.117	-0.113	-0.016					
7	0.022	0.093	0.543**	0.269	0.583	-0.019				
8	-0.181	0.130	0.435**	0.073	0.380**	0.107	0.541**			
9	0.387**	0.260	0.587**	0.431**	0.297*	0.204	0.256	0.217		
10	0.261	0.096	0.174	0.131	0.110	0.263	-0.011	0.323*	0.463**	
11	-0.068	0.089	0.364**	-0.013	0.006	0.122	0.171	0.367**	0.194	0.230
12	0.022	0.184	0.191	0.077	0.150	-0.020	0.324*	0.084	0.187	0.122
13	0.055	0.313*	0.250	0.058	0.334*	-0.036	0.286*	0.033	0.042	-0.047
14	-0.014	0.086	0.331*	0.183	0.431**	-0.104	0.454**	0.145	0.204	-0.036
15	-0.129	0.112	0.246	0.095	0.290*	-0.162	0.294*	0.084	0.020	-0.045
16	0.198	0.020	0.262	0.358*	0.142	0.333*	0.134	0.105	0.355*	0.340*
17	0.153	0.058	0.419**	0.219	0.297*	0.301*	0.466**	0.283*	0.401**	0.217
18	-0.161	0.125	0.269	0.042	0.392**	-0.001	0.588**	0.483**	0.309*	0.145
19	-0.187	0.231	0.349*	0.079	0.491**	0.042	0.717**	0.449**	0.282*	0.099
20	0.264	0.380**	0.413**	0.255	0.347*	0.281	0.290*	0.326*	0.605**	0.351*

*Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level

	11	12	13	14	15	16	17	18	19	20
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12	0.299									
13	0.098	0.327*								
14	0.106	0.384**	0.363**							
15	0.322*	0.221	0.315*	0.470**						
16	0.075	0.065	0.080	0.002	0.085					
17	0.381**	0.420**	0.288*	0.339*	0.259	0.233				
18	0.072	0.163	0.261	0.345*	0.227	-0.133	0.371**			
19	0.143	0.283*	0.282*	0.509**	0.233	-0.027	0.387**	0.785**		
20	0.316*	0.113	0.182	0.304*	0.158	0.222	0.351*	0.294*	0.318*	

Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level

Table 7. Self-Efficacy Actual and Horn's Parallel Analysis Eigenvalues

Factor Number	Actual Eigenvalue	Horn's PA 95% Eigenvalue
1	5.81	2.58
2	2.34	2.22
3	1.58	1.96
4	1.33	1.77
5	1.30	1.60
6	1.06	1.44

Note: PA is the abbreviation for Parallel Analysis

Table 8. Rotated Pattern Matrix for Self-Efficacy Measure – 2 Factor Solution (Varimax Rotation)

	Factor 1: Negative/Affect/ Addiction	Factor 2: Positive/Social/Habit/ Boredom
When I am desiring a cigarette	0.247	0.149
When things are just not going the way I want and I am frustrated	**0.605**	*0.479*
With my spouse or close friend who is smoking	0.316	0.284
When there are arguments and conflicts with my family	**0.684**	0.173
When I am happy and celebrating	-0.229	**0.630**
When I am very angry about something or someone	**0.792**	0.175
When I would experience an emotional crisis, such as an accident or death in the family	**0.429**	*0.398*
When I see someone smoking and enjoying it	0.264	**0.736**
Over coffee or tea while talking and relaxing	-0.077	**0.676**
When I realize that quitting smoking is an extremely difficult task for me	0.271	**0.449**
When I am craving a cigarette	**0.426**	0.006
When I first get up in the morning	**0.501**	-0.039
When I first need a lift	**0.763**	-0.015
When I begin to let down on my concern about my health and am less physically active	**0.579**	-0.034
With friends at a party	-0.048	**0.647**
When I wake up in the morning and face a tough day	**0.551**	*0.514*
When I am extremely depressed	**0.681**	0.138
When I am extremely anxious and stressed	**0.801**	0.135
When I realize I haven't smoked for a while	0.281	**0.653**

Italics denote values that are high enough to be considered for the factor loading but were rejected because the test item had a higher value in another factor.
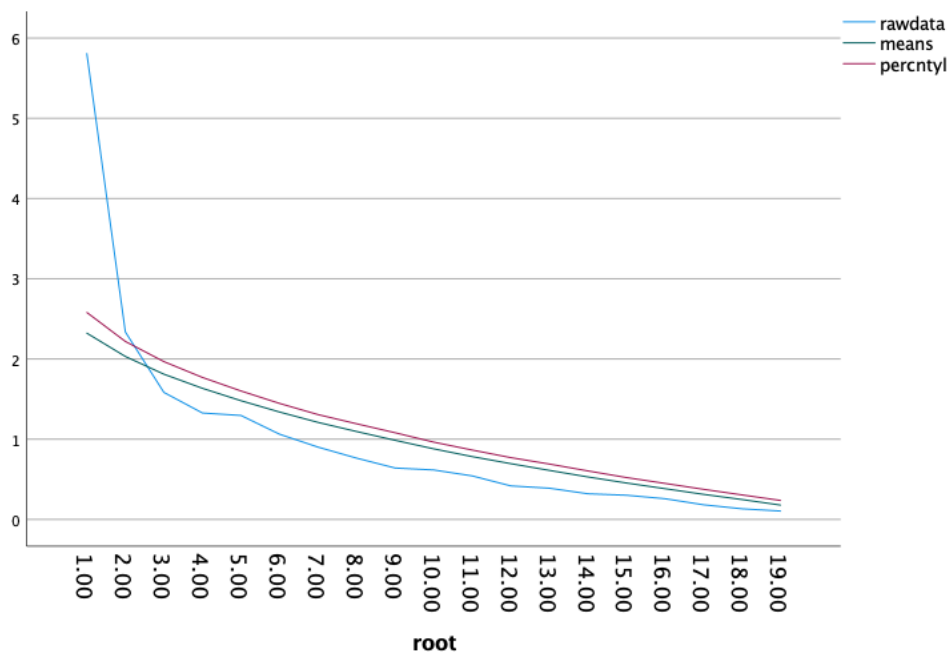
Table 9. Rotated Pattern Matrix for Self-Efficacy Measure – 3 Factor Solution (Oblique Rotation)

	Factor 1: Negative/Affect	Factor 2: Positive/Social	Factor 3: Habit/Addictive
When I am desiring a cigarette	-0.103	0.167	**0.449**
When things are just not going the way I want and I am frustrated	**0.459**	0.356	0.266
With my spouse or close friend who is smoking	0.169	0.236	0.218
When there are arguments and conflicts with my family	**0.567**	0.017	0.268
When I am happy and celebrating	-0.055	**0.658**	-0.290
When I am very angry about something or someone	**0.864**	-0.054	0.070
When I would experience an emotional crisis, such as an accident or death in the family	**0.743**	0.211	-0.302
When I see someone smoking and enjoying it	0.167	**0.696**	0.121
Over coffee or tea while talking and relaxing	-0.010	**0.689**	-0.137
When I realize that quitting smoking is an extremely difficult task for me	0.073	**0.428**	0.258
When I am craving a cigarette	0.025	-0.014	**0.555**
When I first get up in the morning	-0.007	-0.054	**0.698**
When I first need a lift	0.386	-0.132	**0.599**
When I begin to let down on my concern about my health and am less physically active	0.047	-0.065	**0.743**
With friends at a party	-0.146	**0.691**	0.063
When I wake up in the morning and face a tough day	**0.462**	*0.392*	0.186
When I am extremely depressed	**0.862**	-0.088	-0.078
When I am extremely anxious and stressed	**0.872**	-0.098	0.074
When I realize I haven't smoked for a while	0.159	**0.614**	0.160

Italics denote values that are high enough to be considered for the factor loading but were rejected because the test item had a higher value in another factor.

Table 10. Smoking Self-Concept Inter-Item Correlations

	Smoking is part of my self-image.	Smoking is part of who I am.	Smoking is part of my personality.	Smoking is a large part of my daily life.	Others view smoking as part of my personality.
Smoking is part of my self-image.					
Smoking is part of who I am.	0.757**				
Smoking is part of my personality.	0.540**	0.638**			
Smoking is a large part of my daily life.	0.442**	0.530**	0.526**		
Others view smoking as part of my personality.	0.118	0.078	0.143	0.320*	

Source: Shadel, W. G.. & Mermelstein, R. (1996). Individual differences in self-concept among smokers attempting to quit: Validation and predictive utility of measures of the smoker self-concept and abstainer selfconcept. Annals of Behavioral Medicine.
Notes:
*Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level

Table 11. Abstainer Self-Concept Inter-Item Correlations

	I am able to see myself as a non-smoker.	It is easy to imagine myself as a non-smoker.	Not smoking is like me.	I am comfortable with the idea of being a non-smoker.
I am able to see myself as a non-smoker.				
It is easy to imagine myself as a non-smoker.	0.483**			
Not smoking is like me.	0.241	0.254		
I am comfortable with the idea of being a non-smoker.	0.400**	0.237	0.414**	

Source: Shadel, W. G.. & Mermelstein, R. (1996). Individual differences in self-concept among smokers attempting to quit: Validation and predictive utility of measures of the smoker self-concept and abstainer selfconcept. Annals of Behavioral Medicine.
*Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level

Table 12. Self-Concept Actual and Horn's Parallel Analysis Eigenvalues

Factor Number	Actual Eigenvalue	Horn's PA 95% Eigenvalue
1	3.48	1.94
2	1.38	1.60
3	1.04	1.39

Note: PA is the abbreviation for Parallel Analysis
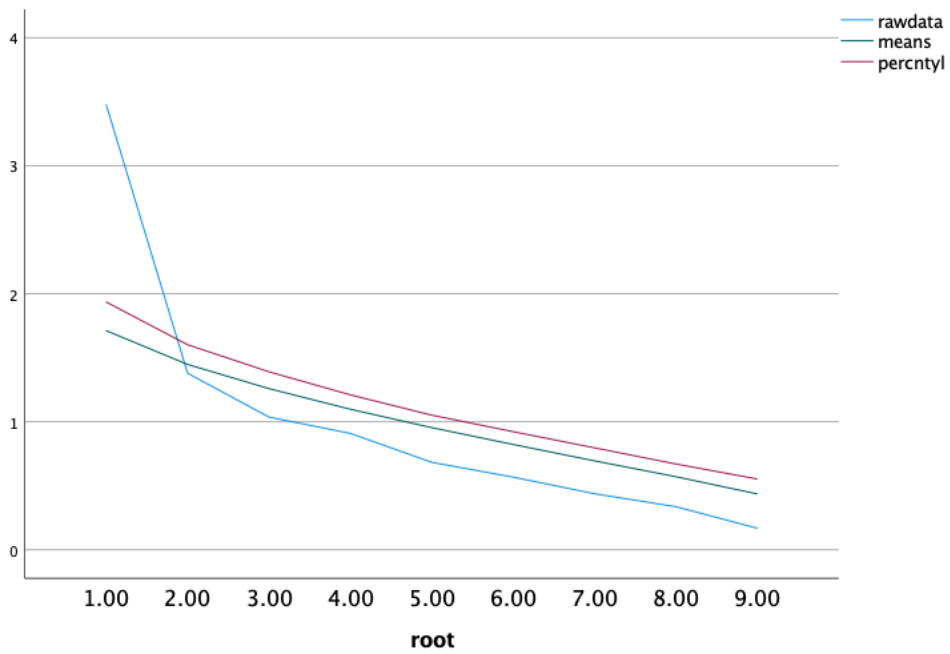
Table 13. Rotated Pattern Matrix for Self-Concept Measure, Model 1 – 3 Factor Solution (Oblique Rotation)

	Factor 1	Factor 2	Factor 3
Smoking is part of my self-image.	**0.846**	-0.256	0.115
Smoking is part of who I am.	**0.837**	-0.259	0.275
Smoking is part of my personality.	**0.767**	-0.245	0.277
Smoking is a large part of my daily life.	**0.772**	-0.135	0.076
Others view smoking as part of my personality.	*0.446*	**0.486**	-0.093
I am able to see myself as a non-smoker.	*-0.439*	**0.670**	-0.112
It is easy to imagine myself as a non-smoker.	-0.308	**0.803**	-0.242
Not smoking is like me.	-0.069	0.009	**-0.885**
I am comfortable with the idea of being a non-smoker.	-0.305	*0.411*	**-0.732**

Note: Italics denote values that are high enough to be considered for the factor loading but were rejected because the test item had a higher value in another factor.

Table 14. Rotated Pattern Matrix for Self-Concept Measure, Model 2 – 3 Factor Solution (Oblique Rotation)

	Factor 1	Factor 2	Factor 3
Smoking is part of my self-image.	**0.866**	-0.094	-0.385
Smoking is part of who I am.	**0.901**	-0.248	-0.321
Smoking is part of my personality.	**0.818**	-0.257	-0.315
Smoking is a large part of my daily life.	**0.739**	-0.055	-0.361
I am able to see myself as a non-smoker.	-0.386	0.106	**0.864**
It is easy to imagine myself as a non-smoker.	-0.334	0.237	**0.823**
Not smoking is like me.	-0.100	**0.886**	-0.052
I am comfortable with the idea of being a non-smoker.	-0.343	**0.731**	*0.458*

Note: Italics denote values that are high enough to be considered for the factor loading but were rejected because the test item had a higher value in another factor.

Table 15. Locus of Control Numbered Items

Number	Item
1	People smoke because circumstances force them to.
2	Most people do not realize that smoking problems are influenced by accidental happenings.
3	I feel so helpless in some situations that I need a cigarette.
4	Trouble at work or home drives me to smoke.
5	Without the right breaks one cannot stop smoking.
6	Many times there are circumstances that force you to smoke.
7	I get so upset over small arguments that they cause me to smoke.
8	Staying off cigarettes depends mainly on things going right for you.
9	When I see a pack of cigarettes, I cannot resist lighting one up.
10	Oftentimes, other people drive me to smoke.
11	It is impossible for me to resist cigarettes if I am at a party where others are smoking.
12	Those who are successful in quitting smoking are the ones who are just plain lucky.
13	I feel powerless to prevent myself from smoking when I am anxious or unhappy.
14	I cannot feel good unless I am smoking.
15	As far as smoking is concerned, most of us are victims of forces we can neither understand nor control
16	I feel completely helpless when it comes to resisting a cigarette.
17	It is impossible for some people to ever stop smoking.
18	It is difficult for smokers to have much control over smoking.
19	If someone offers me a cigarette, I cannot refuse him/her.
20	Sometimes I cannot understand how people can control their smoking.
21	Once I start to smoke I cannot stop.
22	I just cannot handle my problems unless I smoke first.
23	Most of the time I can't understand why I continue to smoke.
24	I have no willpower when it comes to smoking.
25	Smoking is my favorite form of entertainment.

Adapted from: Donovan, D. M., & O'Leary, M. R. The Drinking-related Locus of Control Scale: reliability, factor structure, and validity. Journal of Studies on Alcohol, 1978, 39, 759.784.

Table 16. Locus of Control Scale Inter-Item Correlations

	1	2	3	4	5	6	7	8	9
1									
2	0.152								
3	0.275	-0.019							
4	0.330*	-0.087	0.399**						
5	0.358*	0.492**	0.199	0.081					
6	0.619**	-0.002	0.326*	0.410**	0.247				
7	0.135	0.288*	0.231	0.088	0.074	0.132			
8	0.164	0.047	0.227	0.337*	0.064	0.134	0.107		
9	0.003	0.059	0.243	0.350*	0.004	0.231	0.184	0.134	
10	-0.020	-0.090	0.393**	0.298*	-0.131	0.128	0.134	0.268	0.439**
11	0.091	-0.039	0.267	0.227	0.257	0.129	-0.081	0.220	0.308*
12	0.457**	0.065	0.156	0.103	-0.103	0.255	0.225	0.288*	0.100
13	0.366**	0.082	0.402**	0.377**	0.016	0.416**	0.117	0.154	0.149
14	0.280*	0.193	0.342*	0.091	0.263	0.240	0.349*	0.142	0.208
15	0.448**	0.099	0.199	0.097	0.376**	0.285*	0.104	0.189	0.135
16	0.344*	0.082	0.627**	0.222	0.118	0.329*	0.201	0.134	0.292*
17	0.142	0.042	0.023	-0.194	0.000	0.059	0.108	0.011	0.008
18	0.314*	0.063	0.199	0.178	0.026	0.155	0.215	0.065	0.376**
19	0.106	0.104	-0.020	0.328*	-0.052	0.106	0.017	0.023	0.183
20	0.214	0.114	0.145	0.311*	0.053	0.246	0.028	-0.076	0.291*
21	0.339*	0.076	0.131	0.317*	0.258	0.295*	-0.026	0.140	0.292*
22	0.399**	0.035	0.369**	0.325*	0.290*	0.441**	0.314*	-0.041	0.223
23	0.154	0.183	0.054	0.204	0.282*	0.025	0.004	0.038	0.096
24	0.209	0.099	-0.155	0.063	0.237	0.008	-0.083	-0.021	-0.127
25	0.226	-0.003	0.047	0.280*	0.174	0.173	-0.111	0.274	0.196

*Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level

	10	11	12	13	14	15	16	17	18
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11	0.311*								
12	0.244	0.235							
13	0.178	0.061	0.344*						
14	0.194	0.153	0.329*	0.360*					
15	0.157	0.283*	0.424**	0.184	0.458**				
16	0.359*	0.204	0.372**	0.384**	0.316*	0.321*			
17	0.095	0.085	0.406**	0.031	0.317*	0.253	0.226		
18	0.262	0.283*	0.374**	0.171	0.408**	0.304*	0.332	0.182	
19	-0.055	0.094	0.210	0.294*	0.028	0.145	0.002	-0.240	0.105
20	0.052	0.178	0.387**	0.303*	0.103	0.347*	0.236	0.027	0.267
21	0.181	0.410**	0.341*	0.112	0.177	0.585**	0.237	0.210	0.413**
22	0.090	0.189	0.216	0.242	0.616**	0.424**	0.201	0.116	0.524**
23	0.114	0.062	0.275	0.030	0.099	0.365**	0.231	0.376**	0.194
24	-0.217	0.002	0.151	-0.025	0.037	0.198	-0.123	0.371**	0.047
25	0.173	0.240	0.262	0.124	0.197	0.284*	0.233	0.202	0.239

*Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level

	19	20	21	22	23	24	25
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20	0.356*						
21	0.354*	0.320*					
22	0.178	0.226	0.409**				
23	-0.038	0.453**	0.403**	0.062			
24	0.018	0.220	0.219	0.235	0.341*		
25	0.100	0.055	0.390**	0.109	0.168	0.235	

*Correlation is significant at the 0.05 level
**Correlation is significant at the 0.01 level

Table 17. Locus of Control Actual and Horn's Parallel Analysis Eigenvalues

Factor Number	Actual Eigenvalue	Horn's PA 95% Eigenvalue
1	5.90	2.88
2	2.21	2.48
3	2.06	2.24
4	1.73	2.03
5	1.64	1.86
6	1.49	1.69
7	1.27	1.56
8	1.14	1.44
9	0.95	1.31

Note: PA is the abbreviation for Parallel Analysis
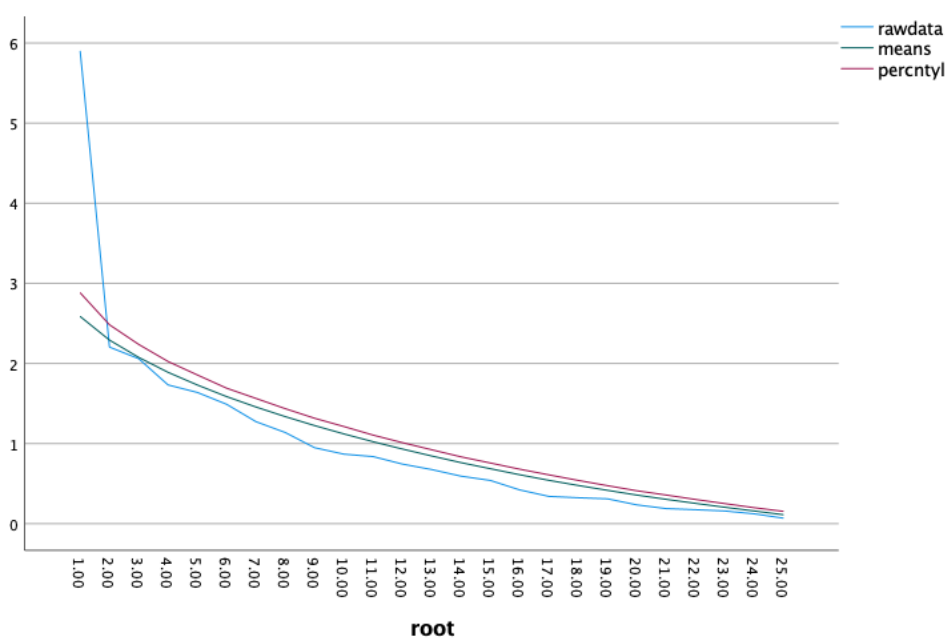
Table 18. Locus of Control Minimum Average Partial Analysis (MAP)

Factor Number	Average Partial Correlation	Power
1	0.0283	0.0024

Table 19. Rotated Pattern Matrix for Locus of Control Measure – 1 Factor Solution (Oblique Rotation)

	1
People smoke because circumstances force them to.	**0.599**
Most people do not realize that smoking problems are influenced by accidental happenings.	0.219
I feel so helpless in some situations that I need a cigarette.	**0.542**
Trouble at work or home drives me to smoke.	**0.530**
Without the right breaks one cannot stop smoking.	0.313
Many times there are circumstances that force you to smoke.	**0.590**
I get so upset over small arguments that they cause me to smoke.	0.263
Staying off cigarettes depends mainly on things going right for you.	0.290
When I see a pack of cigarettes, I cannot resist lighting one up.	**0.427**
Oftentimes, other people drive me to smoke.	**0.414**
It is impossible for me to resist cigarettes if I am at a party where others are smoking.	**0.421**
Those who are successful in quitting smoking are the ones who are just plain lucky.	**0.628**
I feel powerless to prevent myself from smoking when I am anxious or unhappy.	**0.519**
I cannot feel good unless I am smoking.	**0.595**
As far as smoking is concerned, most of us are victims of forces we can neither understand nor control	**0.598**
I feel completely helpless when it comes to resisting a cigarette.	**0.592**
It is impossible for some people to ever stop smoking.	0.312
It is difficult for smokers to have much control over smoking.	**0.606**
If someone offers me a cigarette, I cannot refuse him/her.	0.345
Sometimes I cannot understand how people can control their smoking.	**0.531**
Once I start to smoke I cannot stop.	**0.657**
I just cannot handle my problems unless I smoke first.	**0.645**
Most of the time I can't understand why I continue to smoke.	**0.431**
I have no willpower when it comes to smoking.	0.152
Smoking is my favorite form of entertainment.	0.370

Table 20. Demographic Information for the Kenya Sample and the Bronx Sample

	Kenya Sample (N=50) N(%)/M(SD) or Mdn [IQR]	Bronx Sample (N = 60) N(%)/M(SD) or Mdn [IQR]	Significance
Age (years)	38.45 (9.361)	44.95 (7.973)	<0.001
Gender			0.083
Male	34 (68%)	31 (51.7%)	
Female	16 (32%)	29 (48.3%)	
Marital Status			<0.001
Single	9 (18%)	33 (55.0%)	
Married/Living with partner	24 (48%)	11 (18.3%)	
Separated	14 (28%)	5 (8.3%)	
Divorced	1 (2%)	4 (6.7%)	
Widowed	2 (4%)	7 (11.7%)	
Race/Ethnicity			<0.001
Black/African (American)	48 (96%)	22 (36.7%)	
Hispanic/Latino	0 (0%)	30 (50.0%)	
White/Caucasian	0 (0%)	2 (3.3%)	
Asian/Pacific Islander	1 (2%)	0 (0%)	
Native American/Alaska Native	0 (0%)	0 (0%)	
Somali	1 (2%)	0 (0%)	
Other	0 (0%)	6 (10.0%)	
Religion			0.002
Protestant (Baptist, Presbyterian, Episcopalian, etc.)	17 (34%)	19 (31.7%)	
Catholic	24 (48%)	24 (40.0%)	
Jewish	0 (0%)	0 (0%)	
Hindu	0 (0%)	0 (0%)	
Muslim	9 (18%)	3 (5.0%)	
Buddhist	0 (0%)	0 (0%)	
No religion	0 (0%)	7 (11.7%)	
Other	0 (0%)	7 (11.7%)	
Education			<0.001
Some/all primary/elementary school	24 (48%)	5 (8.3%)	
Some secondary/high school	11 (22%)	16 (26.7%)	

Secondary education/high school	9 (18%)	19 (31.7%)	
Some college education	1 (2%)	16 (26.7%)	
College education	3 (6%)	4 (6.7%)	
Graduate or professional school	0 (0%)	0 (0%)	
No education	2 (4%)	0 (0%)	
Employment Status			<0.001
Working full-time outside the home	30 (60%)	3 (5.0%)	
Working part-time outside the home	11 (22%)	2 (3.3%)	
Working from home	2 (4%)	1 (1.7%)	
Unable to work/disabled	0 (0%)	35 (58.3%)	
Retired	0 (0%)	3 (5.0%)	
In school	0 (0%)	4 (6.7%)	
Unemployed	7 (14%)	11 (18.3%)	
Housing Situation			0.194
Stable	47 (94%)	51 (85.0%)	
Homeless	0 (0%)	0 (0%)	
Transitional	3 (6%)	6 (10.0%)	
Other	0 (0%)	3 (5.0%)	
Years since HIV diagnosis	6.48 (4.415)	13.02 (5.451)	<0.001
Method of HIV Transmission			
Injection Drug Use	20 (40%)	15 (25.0%)	0.191
Heterosexual contact with an infected partner	16 (32%)	32 (53.3%)	<0.001
Same-sex contact with an infected partner	0 (0%)	15 (25.0%)	<0.001
Transfusion	0 (0%)	0 (0%)	
Unknown/Other (use of needles unrelated to drug use)	15 (30%)	6 (10.0%)	0.899
Antiretroviral Use			0.109
Yes	50 (100%)	57 (95.0%)	
No	0 (0%)	3 (5.0%)	
Age participant began smoking	17.53 (4.83)	15.95 (4.959)	0.076
Number of years participant has smoked	22.14 (9.34)	29.00 (9.756)	0.132

Average number of cigarettes per day	14.88 (12.43)	14.43 (9.571)	0.832
Number of quit attempts			0.021
None	15 (30%)	11 (18.3%)	
1-5	22 (44%)	32 (53.3%)	
6-10	1 (2%)	10 (16.7%)	
11 or more	11 (22%)	7 (11.7%)	
Not reported	1 (2%)	0 (0%)	
Longest quit attempt (months)	0.25 [0.05, 2.50]	3.5 [0.25, 12.0]	0.045
Type of quit attempt			
Unassisted			0.379
Yes	31 (62%)	39 (65.0%)	
No	8 (16%)	6 (10.0%)	
Not reported	11 (22%)	15 (25.0%)	
Nicotine replacement (patch, gum, spray)			<0.001
Yes	4 (8%)	23 (38.3%)	
No	35 (70%)	12 (20.0%)	
Not reported	11 (22%)	25 (41.7%)	
Medication (Smoking cessation or anti-depressant)			0.148
Yes	0 (0%)	1 (1.7%)	
No	39 (78%)	18 (30.0%)	
Not reported	11 (22%)	41 (68.3%)	
Group intervention			0.138
Yes	0 (0%)	1 (1.7%)	
No	39 (78%)	17 (28.3%)	
Not reported	11 (22%)	42 (70.0%)	
Individual counseling			0.582
Yes	1 (2%)	1 (1.7%)	
No	37 (74%)	17 (28.3%)	
Not reported	12 (24%)	42 (70.0%)	
Hypnosis			---
Yes	0 (0%)	0 (0%)	
No	39 (78%)	18 (30.0%)	
Not reported	11 (22%)	42 (70.0%)	
Acupuncture			---
Yes	0 (0%)	3 (5.0%)	
No	0 (0%)	16 (26.7%)	
Not reported	50 (100%)	41 (68.3%)	

Note: For details about the Bronx sample and study procedures, see Shuter, Bernstein, & Moadel, 2012.

Table 21. Self-Efficacy/Temptation Scale Item Comparisons Between Kenya and Bronx Samples

Item	Kenya Sample (N = 50) M (SD)	Bronx Sample (N = 60) M (SD)	Significance
How tempted might you be to smoke in this situation?			
1. At a bar or cocktail lounge having a drink	4.36 (1.80)	3.25 (1.48)	<0.001
2. When I'm desiring a cigarette	4.60 (0.70)	3.72 (1.15)	<0.001
3. When things are just not going the way I want and I am frustrated	3.96 (1.31)	3.78 (1.35)	0.491
4. With my spouse or close friend who is smoking	4.04 (1.31)	3.18 (1.43)	0.002
5. When there are arguments and conflicts with my family	3.90 (1.58)	3.72 (1.42)	0.523
6. When I am happy and celebrating	3.38 (1.69)	3.05 (1.43)	0.277
7. When I am very angry about something or someone	4.30 (1.37)	4.15 (1.12)	0.529
8. When I would experience an emotional crisis, such as an accident or death in the family	3.40 (1.83)	3.87 (1.42)	0.145
9. When I see someone smoking and enjoying it	3.76 (1.59)	3.12 (1.52)	0.032
10. Over coffee or tea while talking and relaxing	3.00 (1.78)	3.38 (1.57)	0.236
11. When I realize that quitting smoking is an extremely difficult task for me	2.60 (1.50)	3.08 (1.49)	0.094
12. When I am craving a cigarette	4.50 (1.00)	3.57 (1.41)	<0.001
13. When I first get up in the morning	3.96 (1.55)	3.63 (1.54)	0.272
14. When I first need a lift	3.42 (1.57)	2.97 (1.59)	0.137
15. When I begin to get down on my concern about my health and am less physically active	2.84 (1.62)	3.02 (1.44)	0.547
16. With friends at a party	4.27 (1.32)	3.17 (1.40)	<0.001
17. When I wake up in the morning and face a tough day	3.62 (1.58)	3.70 (1.52)	0.788
18. When I am extremely depressed	3.94 (1.58)	3.80 (1.48)	0.633
19. When I am extremely anxious and stressed	4.08 (1.54)	4.02 (1.32)	0.817
20. When I realize I haven't smoked for a while	3.48 (1.62)	3.05 (1.44)	0.149
TOTAL SCORE	75.13 (15.27)	69.22 (18.24)	0.075

Source: Velicer WF, DiClemente CC, Rossi JS, Prochaska JO. Relapse situations and self efficacy: an integrative model. Addict Behav. 1990;15:271-283.

Note: For details about the Bronx sample and study procedures, see Shuter, Bernstein, & Moadel, 2012.

Table 22. Self-Concept Item Comparisons Between Kenya and Bronx Samples

Item	Kenya Sample (N = 50) M (SD)	Bronx Sample (N = 60) M (SD)	Significance
1. Smoking is part of my self-image.	3.64 (3.06)	3.82 (3.86)	0.755
2. Smoking is a part of who I am.	3.34 (2.95)	3.42 (3.04)	0.894
3. Smoking is part of my personality.	4.56 (3.63)	3.45 (2.91)	0.084
4. Smoking is a large part of my daily life.	4.70 (3.72)	5.15 (3.41)	0.510
5. Others view smoking as part of my personality.	5.50 (3.68)	4.28 (3.41)	0.075
6. I am able to see myself as a nonsmoker.	7.82 (2.79)	6.33 (3.88)	0.022
7. It is easy to imagine myself as a nonsmoker.	6.78 (3.15)	6.87 (3.63)	0.895
8. Not smoking is like me.	8.12 (2.48)	5.08 (3.79)	<0.001
9. I am comfortable with the idea of being a nonsmoker.	9.32 (1.52)	7.65 (3.40)	0.001

Notes:

Source: Shadel, W. G.. & Mermelstein, R. (1996). Individual differences in self-concept among smokers attempting to quit: Validation and predictive utility of measures of the smoker self-concept and abstainer selfconcept. Annals of Behavioral Medicine.

Items 3, 6, 8, and 9 have p-values where equal variances are not assumed. Items 1, 2, 4, 5, and 7 have p-values where equal variances are assumed.

For details about the Bronx sample and study procedures, see Shuter, Bernstein, & Moadel, 2012.

Table 23. Locus of Control Item Comparisons Between Kenya and Bronx Samples

Item	Kenya Sample (N = 50) M (SD)	Bronx Sample (N = 60) M (SD)	Significance
1. People smoke because circumstances force them to.	4.16 (2.21)	3.57 (2.09)	0.154
2. Most people do not realize that smoking is influenced by accidental happenings.	4.42 (2.10)	3.30 (2.04)	0.006
3. I feel so helpless in some situations that I need a cigarette.	4.06 (2.17)	4.08 (2.10)	0.955
4. Trouble at work or home drives me to smoke.	3.88 (2.33)	4.03 (2.07)	0.718
5. Without the right breaks one cannot stop smoking.	4.44 (2.06)	3.43 (2.08)	0.013
6. Many times there are circumstances that force you to smoke.	4.60 (1.92)	4.33 (1.75)	0.448
7. I get so upset over small arguments that they cause me to smoke.	4.46 (1.99)	3.92 (2.18)	0.179
8. Staying off cigarettes depends mainly on things going right for you.	3.76 (2.38)	4.17 (1.99)	0.339
9. When I see a pack of cigarettes, I cannot resist lighting one up.	4.38 (2.14)	3.75 (2.07)	0.120
10. Often times, other people drive me to smoke.	5.00 (1.81)	4.02 (1.96)	0.008
11. It is impossible for me to resist cigarettes if I am at a party where others are smoking.	5.30 (1.58)	4.28 (2.12)	0.005
12. Those who are successful in quitting smoking are the ones who are just plain lucky.	4.04 (2.19)	3.47 (2.24)	0.180
13. I feel powerless to prevent myself from smoking when I am anxious or unhappy.	4.86 (1.65)	3.72 (2.03)	0.001
14. I cannot feel good unless I am smoking.	3.88 (2.20)	2.58 (1.98)	0.002
15. As far as smoking is concerned, most of us are victims of forces we can neither understand nor control.	4.98 (1.73)	3.15 (1.99)	<0.001
16. I feel completely helpless when it comes to resisting a cigarette.	4.58 (1.85)	3.32 (2.03)	0.001
17. It is impossible for some people to ever stop smoking.	3.40 (2.20)	3.20 (2.22)	0.637
18. It is difficult for smokers to have much control over smoking.	4.06 (2.07)	3.28 (2.01)	0.049
19. If someone offers me a cigarette, I cannot refuse him/her.	4.72 (1.81)	2.98 (2.00)	<0.001
20. Sometimes I cannot understand how people control their smoking.	4.48 (1.80)	3.90 (1.96)	0.112

21. Once I start to smoke I cannot stop.	3.40 (2.10)	3.15 (2.07)	0.532
22. I just cannot handle my problems unless I smoke first.	2.82 (2.20)	2.55 (1.83)	0.483
23. Most of the time I can't understand why I continue to smoke.	4.88 (1.71)	4.48 (1.87)	0.253
24. I have no willpower when it comes to smoking.	3.56 (2.14)	3.50 (1.91)	0.877
25. Smoking is my favorite form of entertainment.	3.12 (2.16)	2.65 (1.98)	0.237
TOTAL SCORE	105.24 (23.61)	88.82 (27.72)	0.001

Notes:

Adapted from: Donovan, D. M., & O'Leary, M. R. The Drinking-related Locus of Control Scale: reliability, factor structure, and validity. Journal of Studies on Alcohol, 1978, 39, 759.784.
Items 4, 8, 11, 13-15, and 22 have p-values where equal variances are not assumed. Items 1-3, 5-8, 10-12, 16-21, 23-25, and total score have p-values where equal variances are assumed.
For details about the Bronx sample and study procedures, see Shuter, Bernstein, & Moadel, 2012.

Table 24. Number of References Per Subtheme from Focus Group Transcripts from a Sample of PLWHA Who Smoke in Kenya

Theme/Subtheme	Total (N = 24)	Transcript for Focus Group 1	Transcript for Focus Group 2	Transcript for Focus Group 3
HIV				
Diagnosis	0	0	0	0
Symptoms	0	0	0	0
Treatment Adherence	6	0	4	2
Achieving Remission	0	0	0	0
Psychological Impact of HIV	0	0	0	0
Social Support	0	0	0	0
Healthcare Provider	1	0	1	0
Comorbid Health Problems	31	3	20	8
General Tobacco Use				
Reasons for Smoking	75	29	35	11
Psychological Impact of Smoking	9	1	5	3
Talking to Providers about Smoking	32	13	15	4
Quitting				
Motivation to Quit	55	19	22	14
Barriers/Inducement to Continue	39	10	23	6
Priority of Quitting	4	2	1	1
Frequency of Quit Attempts	6	4	1	1
Duration of Quit Attempts	23	9	13	1
Attempt Types	43	8	24	11
E-Cigarette Use	3	0	2	1
Tobacco Use and HIV				
No relationship between tobacco use and HIV	10	5	5	0
Relationship between tobacco use and HIV	12	6	2	4
HIV and use of another substance in addition to tobacco use	13	2	4	7
Healthcare Provider	7	1	5	1
Addiction				
Craving	51	13	28	10
Preventing Symptoms	13	6	6	1
Routine	27	9	16	2
Environmental Triggers	33	12	19	2
Use of other substances in addition to tobacco use	22	13	5	4
Mental Health				
Psychological disorder (both diagnosed and undiagnosed)	1	1	0	0

Psychotherapeutic treatment (psychotherapy and/or psychopharmacology	0	0	0	0
Stress and Coping	18	6	7	5
Social/Interpersonal Problems				
Smoking as a social norm	35	10	16	9
Stigma when not smoking	13	3	5	5
Stigma when smoking	10	5	4	1
Culture/religion	3	2	0	1
Education	15	2	9	4
Financial	15	2	7	6
Healthcare-related stress	0	0	0	0

Note: Because the focus groups were tape-recorded and then transcribed by an outside transcription service, the transcripts do not consistently provide participant numbers in the transcripts, which means that for the majority of the transcripts, it is not clear which participant said what. Therefore, it was not possible to count how many participants mentioned each theme, as was done in previous qualitative examples.

Table 25. Theme One Illustrative Quotes: HIV

Theme 1: HIV	Illustrative Quotes
Diagnosis	N/A
Symptoms	N/A
Treatment Adherence	"For me when I take my HIV medication well, I have good appetite for food and I take alcohol, I usually do not have any health problems, not even a cough, I only go back to the facility after eight months for my medication refill. But when I have projects to do so I may not drink, I rarely finish two months before having headaches, joint aches along other illness. During the time I'm not stressed up and I take alcohol my body is always okay." Participant, Focus Group 2
Achieving Remission	N/A
Psychological Impact of HIV	N/A
Social Support	N/A
Healthcare Provider	"I have been told by the doctor many times, to quit smoking since it does not give the medication a chance to work effectively." Participant, Focus Group 2
Comorbid Health Problems	"For me, I can say, though, the problem is just smoking, because smoking has really affected me, it has made me sick, it made me suffer from TB, I suffered from TB and was treated and got cured but I still came back to the same cigarette. When I had TB, I wanted to quit smoking, and when I got well I was shocked that I went back to smoking cigarettes." Participant, Focus Group 3

N/A denotes subthemes that had zero coding events.

Table 26. Theme Two Illustrative Quotes: General Tobacco Use

Theme 2: General Tobacco Use	Illustrative Quotes
Reasons for Smoking	"Maybe when you get to adolescence stage you feel like you are now an adult, during this age a person feels like it is right to smoke cigarettes. You always see yourself as an adult and you can smoke, that also contributes. You always see like you are from childhood to adulthood so there is nothing that you can be stopped from doing, you say you are having fun by smoking cigarettes, later you see it is something bad but getting out of it becomes difficult." Participant, Focus Group 1
Psychological Impact of Smoking	"The mind becomes sober, but before you smoke you can even stay the whole day without taking tea or lunch and you don't feel hungry, but you have a craving for cigarettes. Once you smoke a cigarette you won't feel hungry, you are very much okay." Participant, Focus Group 3
Talking to providers about smoking	"That is normal, your doctor will always tell you to stop smoking. If you go, there [to the clinic] the doctor will ask you 'why are you still smoking?'. It is a must." Participant, Focus Group 2
Quitting *Motivation to Quit*	"If I can stop smoking, I will be very happy because even my health will improve and also my other friends will notice that cigarette smoking is not good… so I will also be influencing him to stop smoking." Participant, Focus Group 1
Barriers/Inducement to Continue	"What will not help you to quit is something like having the cravings, if you can eliminate cravings from your mind, then you develop the willpower of quitting smoking, I mean you don't have the cravings and you don't feel like it, when you eliminate the craving." Participant, Focus Group 1
Priority of Quitting	"Let's just say I do not see the importance because I just find myself smoking cigarettes, I have not seen any side effect of smoking, so I tell myself I should just smoke. People tell me I have been smoking for the last thirty years and I'm still alive, that is why I do not find it hard to smoke. That is why I'm saying I do not see any side effects of smoking." Participant, Focus Group 2

Frequency of Quit Attempts	"I have never tried. Nothing has stopped me, it's because I have never thought about quitting but for now I think I want to quit." Participant, Focus Group 2
Duration of Quit Attempts	"For me, I quit cigarette…out of my own volition I quit cigarettes for six months, at that time it was two years since I had started smoking cigarettes. It was in 1999 from that time I have never quit again even for a single day." Participant, Focus Group 1
Attempt Types	"For me, I used to use tropical sweets [menthol flavored sweets]. I was also on TB medication but when I got the urge to smoke I would use tropical sweets." Participant, Focus Group 2
E-Cigarette Use	Sonko [the name of the Nairobi County Governor] stopped smoking cigarettes, there is a cigarette he used to put it here [referring to the mouth], it was plastic, he even shared the story and he did quit smoking completely. What I don't know is whether the plastic had a drug in it…I do not know… and he stopped, and he had said he started smoking when he was still a young boy… so it means there are several ways to quit smoking. Participant, Focus Group 3

Table 27. Theme Three Illustrative Quotes: Tobacco Use and HIV

Theme 3: Tobacco Use and HIV	Illustrative Quotes
No relationship between tobacco use and HIV	"Because when you use this medication that we normally use, the ARVs and then you smoke cigarettes, I don't think there are any side effects, because that smoke doesn't always interfere with the strength [effectiveness of ARV] of medication in the body, and we are normally told that HIV is not a disease, HIV is a sickness that is in…. it's a bacterial disease [misinformation that HIV is a bacterial disease] … so on my side I don't think there are any effects." Participant, Focus Group 1
Relationship between tobacco use and HIV	"I have to say that cigarettes make these medications, these ARVS that I use...not to work effectively. Smoking every now and then… and I'm taking medication daily…it has effects. I think if I quit …at least I will see the effectiveness of these drugs." Participant, Focus Group 3
HIV and use of another substance in addition to tobacco use	"I tried [to quit] when I started medication (HIV medication) I was using bhang and alcohol and I quit. During that time, I tried to quit cigarettes too, I would stay the whole day without smoking but by evening I would no longer contain the urge and I would smoke. I was able to quit everything else but for cigarettes I have tried but it has become really difficult." Participant, Focus Group 2
Healthcare Provider	"The first time he asked me if I smoke and I told him I smoke, he went ahead to tell me I need to stop smoking but did not give me a reason why I need to stop smoking, I ignored. It is until recently that he told me he would connect me to some people who would advise me on how to quit smoking, I think it was you the researchers. I wondered how he knew I was still smoking because my CD4 had not changed. Though he had told me to quit smoking." Participant, Focus Group 2

Table 28. Theme Four Illustrative Quotes: Addiction

Theme 4: Addiction	Illustrative Quotes
Craving	"This urge has to subside, but it may not be possible to stop for a person who is a heavy smoker. If the cigarette hasn't gotten into someone so much… there are people who are not so addicted to cigarettes, you find that someone is able to stay from morning to midday without smoking – that is not a heavy smoker. For an addict, the moment you stay for a few minutes you realize the body is missing something. If there is medication to help reduce nicotine in the body's system, then quitting cigarette may not be that difficult but without medication it might be hard." Participant, Focus Group 2
Preventing Symptoms	"I'm saying, when I have cigarette urge and I fail to get a cigarette it really bothers me, I always feel like I have a headache from this vein [points at the side of his forehead] it makes me run around to find a person who has cigarettes so that they can lend it to me." Participant, Focus Group 1
Routine	"Like for me, I'm so used to it that if I don't smoke one cigarette while I'm in bed I may not be able to sleep." Participant, Focus Group 2
Environmental Triggers	"One thing I think will not help us is that when you see smokers smoking cigarette you will have that desire which will be too much, so it can weigh us down so if you put mind [setting your mind] where whether someone smoke cigarettes or not you are not interested then you will succeed." Participant, Focus Group 1
Use of other substances in addition to tobacco use	"I started injecting heroin in 2007, but before that I used to smoke though I was smoking bhang, when I started using heroin I stopped having the urge to smoke bhang, so after injecting heroin I would get the urge to smoke and I would now smoke cigarettes [after injecting heroin he smokes cigarettes to feel even more high] so that is when I started smoking, which was in 2008." Participant, Focus Group 1

Table 29. Theme Five Illustrative Quotes: Mental Health

Theme 5: Mental Health	Illustrative Quotes
Psychological Disorder (both diagnosed and undiagnosed)	"I wanted to say for some people it is depression that causes them to start smoking cigarettes… when they are at work they have peace but when they come home every time there are issues, you find before they get to the house they hide somewhere and smoke a cigarette…. for others its depression that causes them to smoke." Participant 5, Focus Group 1
Psychotherapeutic treatment (psychotherapy and/or psychopharmacology)	N/A
Stress and Coping	"For me my smoking depends with the mood I'm in, I may be having stress, when you are stressed you may end up smoking too much. Secondly it depends with the situation I'm in, say I have a job that is stressing me that will cause me to smoke a lot. For me when I say on average you may find I smoke between 10-20 sticks a day." Participant 4, Focus Group 2

N/A denotes subthemes that had zero coding events.

Table 30. Theme Six Illustrative Quotes: Social/Interpersonal Problems

Theme 6: Social/Interpersonal Problems	Illustrative Quotes
Smoking as a Social Norm	"For me it is friends, it is friends who caused… yes… when I would walk with them when they light up the cigarette after smoking, when it is halfway they pass it to you. When you try to tell them you have quit they still insist so you end up smoking…yes. So when you smoke a few puffs after few days you find that you have relapsed." Participant 2, Focus Group 1
Stigma when not smoking	"For me it is my friends who caused me to start smoking cigarette. When we were walking they would tell me…. they were older than me and they would tell me if I don't come with a cigarette yet we have a shop I should not follow them, and for me because I wanted their friendship I would go to our shop take a packet of roaster [name of a local cigarette brand] and I give to them. They would smoke and tell me to also try, I continued with the trend and that is how I ended up smoking and I have never stopped." Participant, Focus Group 1
Stigma when smoking	"Let's say we are in a meeting like this, or in a public transport vehicle or any other meeting, you know even when you come with a cigarette there, you will hear 'you guy, get out of here with that cigarette.' If you are in a group of people you will not light up a cigarette, so if you have to smoke you have to get away from people which makes it appear like a bad disease (to mean it is something really bad)." Participant, Focus Group 2
Culture/religion	"I have faith just like it was said there would be drug, I have faith that the drug will help us, it will be our cure, and I have very big faith before God that it will be our cure!" Participant, Focus Group 3
Education	"I would say the way [Participant 2] has said, nobody was forced to come to this session. It was voluntary and we came because we wanted to know how we can be able to quit cigarette smoking. So it is for you (the researchers) to find a way that can help us quit the cigarette. Talks alone may not be sufficient since we have received information from the radio, television, churches, chiefs but it did not yield. The solution is for you to get us medication." Participant 4, Focus Group 2

Financial	"Another thing, it's very expensive. You find that when you are in the house and having vegetables, that money that you would have used to buy tomatoes, you will use it to buy cigarettes. Since the cheapest cigarette now is ten shillings, and you find smoking almost fifteen cigarettes in a day, that is one hundred and fifty shillings. It increases poverty, it doesn't help you with anything after smoking, instead you develop sickness in your body." Participant, Focus Group 3
Healthcare-related stress	N/A

N/A denotes subthemes that had zero coding events.

Appendix A: Focus Group Interview Questions

Introduction
10 minutes
	<u>Introduction</u>
	    Thank you so much for your willingness to take part in this group discussion. My name is **[Name]** from University of Maryland. We are doing a research study on Optimizing Smoking Cessation Interventions for People Living With HIV in Kenya. The purpose of this group discussion is to help us better understand your experience as smokers in our goal to develop a quit smoking program that meets the needs of smokers like yourself.
	
	    This is very informal; you can talk about anything you think is important for us to know. I also want to remind you that everything we will discuss today will be confidential. No one will hear this recording except for people working on the project. Whenever we write a report, we will use numbers or fake names so no one can identify you. If there are any questions you'd rather not answer, just let me know - that's fine. Remember, your answers to our questions will not be considered "right" or "wrong", because we want to know about what you think. They are merely information you will provide based on your experiences, observations, or feelings. Everyone's views are equally important. It's fine to disagree with other people's views, but if you do, it's important to disagree in a respectful and polite manner. It's important for you to talk in turns, because if you all speak at once, we will not have a clear recording. If you disagree with something anyone says, you can say 'I disagree' and then wait for them to finish before you speak. We will take about 60 minutes.
	
	    Explain the role of note-takers and tape-recorder **Give a few minutes for answering any questions regarding the FGD** Probes

(Moderator: Begin with an ice breaker)
 	
Reasons for Smoking
10 minutes
	How old were you when you started smoking?
	What influenced you to smoking?
	How often do you smoke?
	What makes you smoke?
	List A:
	    Pleasurable.
	    Alleviates boredom.
	    Helps with stress / it's relaxing
	    Manages depression **(Probe: how does smoking manage depression?)**
	    Manages anxiety **(Probe: how does smoking manage anxiety?)**
	    Manages anger **(Probe: how does smoking manage anger?)**

	Avoidance of withdrawal symptoms. Helps pain meds work better **(Probe how?)** Helps HIV medication work better **(Probe: In what ways?)** Helps remove the bad taste from medications **(Probe how)** Smoking helps me deal with my HIV infection **(Probe how?)** No motivation to quit **(Would you like to have motivation for quitting? What kind of motivation would you like?)** It's a social activity; Influence from many friends or family members smoke Keeps my weight down Addicted to it. It keeps me from doing harder drugs/alcohol It gives me energy **(Probe: Gives you energy to do what kind of activities)** Helps me concentrate better Too hard to quit **(Probe: What makes it hard to quit)** Never received medical advice to quit. Not worried about my health *(**If items from list A above are missing, ask** "No one has mentioned X, Y, or Z; Has anyone found these to be related to why you smoke?")*
Barriers to Quitting 10 minutes	"When we look at this list, which reasons are the ones that make it most difficult to quit?" **Moderator: get them to describe how these reasons makes it most difficult to quit and find out what they think can be done to help them quit smoking)** *Add follow-up question:* "How does having HIV affect your desire and efforts to quit?"
Facilitators to Quitting 10 minutes	**Do you think quitting smoking can help improve your health in any way?** **What are the benefits of quitting smoking?** **Have you ever tried to quit smoking in the past?** **If YES, add follow-up question**: When you've tried quitting in the past, what helped you the most? **(Moderator: get them to explain what helped most to quit smoking)** **If NO, what prevented you from trying to quit smoking?** What other things do you think would have been helpful when you tried quitting? What do you think was <u>not</u> helpful?"
10 minutes	How do you think HIV-infection affects your smoking?

	How do you think smoking affects your HIV infection? *Add follow-up questions:* "How does the provider/doctor who manages your HIV treat your cigarette smoking?" "Do you think receiving medical advice about quitting would have been helpful? **If YES**, what makes you think so? **If NO**, what makes you think so?
10 minutes	"What do you think is <u>not</u> helpful?"
Summary 5 minutes	Summarize discussion about why one smokes and what would be helpful in assisting smokers to quit. Appreciate the participants and thank them for their time as you end the discussion.

Appendix B. Focus Group Codebook

1) HIV
   a) Diagnosis
   b) Symptoms
   c) Treatment Adherence
   d) Achieving remission (impact life and other health behaviors)
   e) Psychological impact of HIV
   f) Social support
   g) Healthcare provider
   h) Comorbid health problems
2) Tobacco Use General
   a) Reasons for smoking
   b) Psychological impact of smoking
   c) Talking to providers about smoking
   d) Quitting
      i) Motivation to quit
      ii) Barriers/Inducement to continue
      iii) Priority of quitting
      iv) Frequency of quit attempts
      v) Duration of quit attempts
      vi) Attempt types
   e) E-cigarette use
3) Tobacco Use and HIV
   a) No relationship between tobacco use and HIV
   b) Relationship between tobacco use and HIV
   c) HIV and use of another substance in addition to tobacco use
   d) Healthcare provider
4) Addiction
   a) Craving
   b) Preventing Symptoms
   c) Routine
   d) Environmental Triggers
   e) Use of other substances in addition to tobacco use
5) Mental health
   a) Psychological disorder (both diagnosed and undiagnosed)
   b) Psychotherapeutic treatment (psychotherapy and/or pharmacology)
   c) Stress and coping
6) Social/interpersonal problems
   a) Smoking as a social norm
   b) Stigma when not smoking
   c) Stigma when smoking
   d) Culture/religion
   e) Education
   f) Financial
   g) Healthcare-related stress