Identifying factors associated with quit intentions among smokers from two nationally representative samples in Africa: Findings from the ITC Kenya and Zambia Surveys

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ABSTRACT

It is well established that intentions to quit smoking is the strongest predictor of future quit attempts. However, most studies on quit intentions have been conducted in high-income countries with very few in low- and middle-income countries particularly in Africa. This is the first population-based study to compare factors associated with quit intentions among smokers in two African countries. Data were from the International Tobacco Control (ITC) Kenya and Zambia Surveys (2012), face-to-face surveys of nationally representative samples of 2291 adult smokers (Kenya = 1103; Zambia = 1188). Multivariate logistic regression analyses were conducted to identify predictors of quit intentions. Most Kenyan (65.1%) and Zambian (69.1%) smokers had quit intentions of which 54.8% planned to quit within the next 6 months. Five factors were significantly associated with quit intentions in both countries: being younger, having tried to quit previously, perceiving that quitting is beneficial to health, worrying about future health consequences of smoking, and being low in nicotine dependence. The predictive strength of these factors did not differ in the two countries. Four additional factors were significant predictors in Zambia only: having a quit attempt lasting six months or more, lower smoking enjoyment, having a negative opinion about smoking, and concern about cigarette expenses. The factors predicting quit intentions were similar to those in other ITC countries including Canada, US, UK, China and Mauritius. These findings highlight the need for stronger tobacco control policies in Kenya and Zambia including increased taxation, greater access to cessation services, and anti-smoking campaigns denormalizing tobacco use.

1. Introduction

Globally, tobacco use is the leading cause of preventable disease, disability, and death. There are more than one billion smokers in the world, and tobacco use kills up to half of all lifetime users, totalling about 7 million tobacco-related deaths annually (Blecher and Ross, 2013; WHO, 2018). Six percent of the world's adult smokers live in Africa (Blecher and Ross, 2013). However, if current trends persist, 26% of the world's smokers (about 413 million people) will live in Africa by 2100 (Blecher and Ross, 2013).

Tobacco use is declining in high-income countries (HIC) but increasing in low-and middle-income countries (LMICs) where the tobacco industry is actively marketing its products and executing lobbying strategies to undermine national anti-smoking measures (CTFK, 2017). By 2030, tobacco–attributable deaths are projected to double in LMICs (WHO AFRO, 2017). In some African countries, smoking prevalence is above 48% for males and 20% for females (WHO AFRO, 2013).Thus, smoking cessation and prevention continues to be a

priority. However, quitting tobacco use is challenging and normally entails multiple quit attempts (Chaiton et al., 2016; DiClemente et al., 1991). Consistent with behavioural theories, like the Theory of Planned Behaviour (Ajzen, 1991) and Transtheoretical Model of Change (Prochaska and Velicer, 1997), studies have shown that having an intention to quit smoking is a strong predictor of future quit attempts, as well as quit success (Hyland et al., 2006). As such, it is important to identify and understand the factors that are associated with and predict quit intentions (Hyland et al., 2006; Rise et al., 2008).

Studies in HIC (United States of America, Canada, the United Kingdom, Australia, Korea, and Hong Kong), upper-middle-income countries (Mauritius and China) and two lower-middle income country (Bangladesh and India) have shown that factors that are associated with quit intentions include being male (Abdullah and Yam, 2005), single (Aryanpur et al., 2016), older (Kim et al., 2017), high income (Siahpush, 2006), higher education (Abdullah and Yam, 2005; Siahpush, 2006), having a past quit attempt (Driezen et al., 2016; Feng et al., 2010; Yu et al., 2004), having longer duration of quit attempts (Feng et al., 2010; Kaai et al., 2016), having lower nicotine dependence (Driezen et al., 2016; Feng et al., 2010; Kim et al., 2017), having fewer smoking friends (Hitchman et al., 2014), seeing a health care provider (Driezen et al., 2016; Gould et al., 2015), higher knowledge of the health risks of smoking (Choi et al., 2018; Sansone et al., 2012), worrying about future health (Driezen et al., 2016; Feng et al., 2010; Kaai et al., 2016), perceiving benefit of quitting (Driezen et al., 2016; Feng et al., 2010; Kaai et al., 2016; Wang et al., 2005; Yu et al., 2004), having higher levels of self-efficacy (Gould et al., 2015; Wang et al., 2005), not enjoying smoking (Abdullah and Yam, 2005; Driezen et al., 2016; Kaai et al., 2016), and having a negative opinion about smoking (Feng et al., 2010). A few studies found that demographic characteristics (Feng et al., 2010; Kaai et al., 2016) and nicotine dependence (Kaai et al., 2016) were not associated with quit intentions.

Nearly all of the existing studies on the factors that are associated with quit intentions have been conducted in HIC and upper-middle-income countries, and only two of these studies (Hyland et al., 2006; Siahpush, 2006) have conducted cross-country comparisons of these factors. Moreover, very few studies on predictors of quit intentions have been conducted in LMICs, notably in Africa (Agaku et al., 2012; Girma et al., 2010; Kaai et al., 2016; Shapiro et al., 2011), and only one (Kaai et al., 2016) used nationally representative data. A teen study by Agaku et al. (2012) found that parents' use of tobacco, peers' use of smokeless tobacco, perception of harm from tobacco use, and perception that tobacco use made one comfortable in social events were associated with quit intentions. While, a community study by Girma et al. (2010) showed that low nicotine dependence and high self-efficacy were associated with quit intentions.

The present study is the first population-based study to compare the factors associated with quit intentions among smokers in two African countries. The study was conducted in Kenya and Zambia using data from the International Tobacco Control Policy Evaluation Project (ITC Project) surveys. Tobacco use in the African region is currently relatively low compared to other regions in the world, but is growing (Blecher and Ross, 2013; Oluwafemi, 2003; WHO, 2015). Each year more than 8100 Kenyans and 7900 Zambians die of tobacco-related disease (Drope et al., 2018). Kenya and Zambia ratified the WHO Framework Convention on Tobacco Control (FCTC) on June 2004 and August 2008 respectively. However, both countries differ in the implementation and enforcement of these policies.

Overall, Kenya has implemented more and stronger tobacco control policies with better enforcement compared to Zambia (WHO, 2017b, 2018). For example, while Kenya has 14 Pictorial Health Warnings (PHWs), Zambia has only one English text warning that covers < 30% of the pack. Kenya has a comprehensive ban on tobacco advertising, promotion and sponsorship, but Zambia still permits the advertising of tobacco products to the general public. Misleading descriptors like "light" and "low tar" brands are banned in Kenya, but still allowed in

Zambia (ITC Project, 2015c). There is also a heavy presence of the tobacco industry "Corporate Social Responsibility" activities in Zambia (Drope, 2011).

Article 14 of the FCTC obligates Parties to take effective measures to promote smoking cessation and provide treatment for tobacco dependence (WHO FCTC, 2005). Despite the importance given to cessation programs, there are no comprehensive cessation services offered in most public care facilities in Kenya and Zambia (WHO, 2017a, 2017b) and health care providers in Kenya do not routinely provide cessation interventions to their patients (Gichuki et al., 2016). In both countries, some cessation support is available through private health facilities and from some health professionals which comes at a fee that most smokers cannot afford (Ngaruiya et al., 2018; WHO, 2017b, 2017a). In 2017, the Kenyan Ministry of Health developed national guidelines (MOH, 2017) to train health workers to offer cessation counselling and support.

Nicotine replacement therapies (NRT), as well as buproprion and varenicline (currently not available in Kenya), are available from private pharmacies with a prescription, but they are not covered by the national health insurance and thus many smokers cannot afford them. Zambia does not have a national toll-free quitline (ITC Project, 2015a, 2015c) and Kenya has one 24-hour drug helpline established in 2012 (NACADA, 2012). With such limited resources, existing cessation programs need to prioritize smokers (preferably those that have a quit intention) who are more likely to benefit from these scarce services. Results from this study can help inform smoking cessation practitioners to design quit programs that will target smokers who will benefit most from the limited cessation resources.

2. Methods

2.1. Study design and participants

The ITC Kenya and Zambia Surveys are part of the larger global ITC Project, which has conducted longitudinal cohort surveys in 29 countries. Evaluating FCTC policies is a key objective of the ITC Project. The ITC Kenya and Zambia Surveys were conducted among nationally representative samples of adult tobacco users and non-users aged 18 years and older. Samples were selected using a multi-stage clustered sampling design. A detailed description of the study design is available (ITC Project, 2015d, 2015b).

The respondents for this study were adult smokers aged 18 years and older. Smokers were defined as those who had smoked at least 100 cigarettes in their lifetime and smoked at least once in the past 30 days. The sample sizes for smokers in each country were as follows: Kenya, $n = 1103$ and Zambia, $n = 1188$. The data were collected between September and December 2012. Face-to-face interviews were conducted in English and local languages. The overall individual response rates in Kenya and Zambia were 82.3% and 93.4% respectively. Research ethics approval was obtained from the University of Waterloo Human Research Ethics Committee, the University of Zambia Biomedical Research Ethics Committee and the Kenyatta National Hospital/University of Nairobi Ethics Review Committee.

2.2. Measures

2.2.1. Dependent variable

Intentions to quit were based on responses to the question: "Do you plan to quit smoking?" Respondents who selected "in the next month", "in the next 6 months", or "sometime in the future after 6 months" were defined as having an intention to quit = 1, and those who responded "not at all" were defined as having no intention to quit = 0.

2.2.2. Independent variables

The socio-demographic variables used in this study were: (1) gender (male, female), (2) location (Kenya, Zambia), (3) age at the time of the survey (18–24, 25–39, 40–54, 55 years and older), (4) income (defined

as a measure of the respondent's combined average household income for 1 year) was recoded into three categories (low, moderate, and high), and (5) education (defined as the respondent's highest level of education achieved) was recoded into three categories, i.e., low (respondents with no education or lower than primary education), moderate (respondents with some primary education or those who completed primary education), and high (respondents with secondary education or higher).

Quitting history variables assessed were: tried to quit smoking within the last year (yes, no), and longest time off smoking (never tried to quit, < 1 month, between 1 to < 6 months, 6 months or more). Nicotine dependence was measured using the Heaviness of Smoking Index (HSI; 7 levels, 0 = least addicted to 6 = most addicted), which was based on the sum of two categorical variables: number of cigarettes smoked per day (CPD), (0 = 0–10, 1 = 11–20, 2 = 21–30, 3 = 31 and over), and time to first CPD (0 = more than 60 min, 1 = 31–60 min, 2 = 6–30 min, 3 = 5 min or less).

Motivational variables assessed were: (1) perceived benefit of quitting, i.e., "If you were to quit smoking cigarettes permanently in the next 6 months, how much do you think it would improve your health?" (recoded into three categories: "not at all/slightly", "moderately", and "very much/extremely"), and (2) worries about health in the future ("not at all", "a little/moderately", and "very much").

Favourable attitude about smoking was measured by asking for rating of agreement with the statement: "You enjoy smoking too much to give it up." This variable was recoded into three categories: "disagree/strongly disagree", "agree/strongly agree", and "neutral (neither disagree nor agree)." Overall opinion about smoking was measured by asking: "What is your overall opinion of smoking?" This variable was recoded into three categories: good (very good/good), bad (bad/very bad) and neutral (neither good nor bad).

Concern about the expense of cigarettes was assessed by asking for rating of agreement with the statement: "You spend too much money on cigarettes" (recoded into three categories i.e., "disagree/strongly disagree", "agree/strongly agree", and "neutral (neither disagree nor agree)"). An injunctive norm of smoking: "Society disapproves of smoking", was also assessed and recoded into three categories: "disagree/strongly disagree", "agree/strongly agree", and "neutral (neither disagree nor agree)".

2.3. Statistical analyses

Data from the two countries were pooled together into one dataset. Data was analysed using SAS 9.3. Multivariate survey logistic regression models were conducted by incorporating complex survey sample designs, including stratification, clustering, and weighting for statistical inferences to minimize potential systematic errors caused by unequal selection probabilities and biases. This procedure was important to ensure that results were nationally representative. Using the pooled dataset, each independent variable was first tested in separate models by controlling for country, gender, age, and education to assess the association between each predictor (independent variable) and quit intentions (dependent variable). A multivariate model (Model 1) was then constructed using the same pooled dataset to include all predictors that had significant associations with quit intentions, controlling for country, gender, age, income and education. This model showed the overall impact of each predictor on quit intention, independent of all the other variables included in the model. Finally, a regression model that added country x predictor product terms from Model 1 was also constructed to test whether the differences in the magnitude of the associations between the two countries were significant.

To examine the specific predicting power of the predictors in each country, we used separate datasets. We constructed two multivariate Models, i.e., Model 2 and 3, for Kenya and Zambia respectively. The Models included the same variables as Model 1, except for the country variable.

Table 1
Characteristics of the Kenyan and Zambian Smokers (unweighted), Kenya and Zambia, Sept–Dec 2012.

Variable	Overall N = 2291 %	Kenya N = 1103 %	Zambia N = 1188 %	Chi-square p value %
Gender (% males)	93.2	91.5	94.9	0.0013
Age group				0.0014
18–24	12.6	9.9	15.2	
25–39	44.3	45.7	42.9	
40–54	25.8	27.4	24.4	
≥55	17.3	17.0	17.5	
Monthly household income				< 0.0001
Low	48.5	48.4	48.5	
Medium	15.8	19.3	12.5	
High	15.6	5.3	25.3	
Not stated	20.1	27.0	13.7	
Level of education				0.0006
Low (illiterate/below primary school)	9.8	8.1	11.4	
Moderate (some primary/ completed primary)	49.8	47.8	51.7	
High (secondary school or higher)	40.4	44.1	37.0	
Intention to quit				0.0503
Does not plan to quit	32.8	34.9	31.0	
Plans to quit	67.2	65.1	69.1	
Time to intention to quit				0.0243
Not planning to quit	32.8	34.9	31.0	
Within the next month	10.4	8.8	11.9	
Within the 6 months	11.6	10.6	12.4	
Beyond 6 months	45.2	45.8	44.7	
Ever tried to quit smoking within 12 months				0.1385
Yes	29.5	28.0	30.8	
No	70.5	72.0	69.2	
Longest time off smoking				0.4228
Never quit	60.2	60.9	59.6	
Less than 1 month	19.4	18.8	20.0	
1 month to < 6 months	14.5	15.1	14.0	
6 months or more	5.9	5.2	6.5	
Ever heard of stop smoking medications				< 0.0001
Yes	9.0	13.8	4.6	
No	91.0	86.2	95.4	

3. Results

3.1. Characteristics of the sample

Table 1 shows the characteristics of the smoker sample from Kenya and Zambia. Study respondents were mainly male (93.2%). Mean age of sample was 40.05 years (SD 15.26) and less than half (40.4%) of respondents had secondary school level education or higher. There were significant demographic (i.e., gender, age, monthly household income and level of education) differences between Kenyan and Zambian smoker respondents.

More than half (67.2%) of the respondents had intentions to quit smoking with intentions to quit being similar between the two countries (65.1% in Kenya and 69.1% in Zambia). Among Kenyan and Zambian smokers who had quit intentions, 54.8% were planning to quit within 6 months or less. Overall, very few smokers had heard about "stop smoking" medications, especially among Zambian smokers (4.6%) compared with Kenyan smokers (13.8%).

3.2. Bivariate and multivariate associations

Results from the bivariate regression analyses (Table not included) showed that quit intentions was associated with almost all the independent variables that were tested. After adjusting for all other variables in the multivariate model (Table 2), most variables tested

Table 2

Factors associated with intentions to quit smoking, Kenya and Zambia, Sept–Dec 2012.

Predictors	Overall (both countries) (Model 1)					Kenya (Model 2)			Zambia (Model 3)		
	N	Quit intentions (raw %)	Odds ratio	95% CI		Odds ratio	95% CI		Odds ratio	95% CI	
Country											
Zambia	1160	69.1	Ref			–	–	–	–	–	–
Kenya	1038	65.1	0.91	0.57	1.44	–	–	–	–	–	–
Gender											
Female	150	63.3	Ref			Ref			Ref		
Male	2048	67.5	1.21	0.51	2.86	1.08	0.48	2.42	2.18	0.57	8.34
Age group											
18–24 years	280	72.9	3.29	1.78	6.10	8.00	3.06	20.95	1.85	0.69	5.01
25–39 years	981	70.3	1.98	1.29	3.05	2.04	1.19	3.51	2.09	1.07	4.06
40–54 years	564	63.7	1.20	0.81	1.78	1.38	0.79	2.40	1.08	0.60	1.93
≥55	373	60.1	Ref			Ref			Ref		
Level of education											
Low (illiterate/not done primary school)	213	59.2	Ref			Ref			Ref		
Moderate (some/completed primary)	1087	66.9	1.27	0.69	2.36	1.22	0.60	2.48	1.55	0.63	3.84
High (secondary school or higher)	882	69.4	1.28	0.69	2.37	1.47	0.65	3.36	1.24	0.49	3.17
Household income											
Low	1071	63.7	Ref			Ref			Ref		
Medium	349	71.1	1.47	0.82	2.65	1.57	0.70	3.52	1.20	0.51	2.84
High	344	70.4	1.44	0.84	2.46	2.37	0.87	6.47	0.94	0.52	1.70
Not reported	434	70.3	1.07	0.66	1.75	1.62	0.80	3.29	0.65	0.34	1.26
Tried to quit within the past year											
No	1531	57.8	Ref			Ref			Ref		
Yes	653	89	3.63	1.54	8.54	3.77	1.56	9.10	5.90	1.15	30.24
Longest time off smoking											
Never quit	1305	54.3	Ref			Ref			Ref		
Less than 1 month	437	86	1.67	0.83	3.37	1.66	0.63	4.38	0.71	0.30	1.71
1 to < 6 months	325	86.2	1.69	0.89	3.22	1.55	0.67	3.57	1.09	0.36	3.32
6 months or more	131	86.3	3.79	1.51	9.53	2.54	0.95	6.77	9.66	3.39	27.56
Heaviness of Smoking Index (HSI) (HSI is treated as continuous variable)[a]											
0–6[a]			0.74	0.66	0.83	0.74	0.63	0.88	0.75	0.64	0.89
Outcome expectancy (benefits) of quitting											
Not at all/slightly	564	45.2	Ref			Ref			Ref		
Moderately beneficial	278	57.9	2.23	1.42	3.51	2.37	1.32	4.24	2.88	1.38	6.02
Very much/extremely beneficial	1251	81.8	3.72	2.64	5.25	3.38	2.08	5.48	5.95	3.82	9.28
Worried about health in the future											
Not at all	449	39.4	Ref			Ref			Ref		
A little/moderately	874	67.9	3.10	1.91	5.04	3.69	1.81	7.51	3.04	1.51	6.13
Very worried	824	82.2	4.05	2.47	6.63	3.62	1.81	7.24	5.74	2.85	11.56
Favourable attitude about smoking-enjoy smoking too much to give it up											
Strongly agree/agree	628	51.8	Ref			Ref			Ref		
Disagree/strongly disagree	1366	75.4	1.31	0.71	2.39	1.36	0.79	2.36	4.13	2.55	6.71
Neutral	177	62.2	1.96	1.35	2.84	0.70	0.34	1.42	5.01	2.12	11.81
Overall opinion of smoking											
Good: Very good/good	158	30.4	Ref			Ref			Ref		
Bad: Bad/very bad	1833	72.7	1.85	0.53	6.50	1.19	0.23	6.29	5.05	2.14	11.92
Neutral	185	43.2	3.11	1.09	8.86	0.66	0.12	3.63	3.85	0.89	16.60
I spend too much money on cigarettes											
Disagree/strongly disagree/neutral	696	62.6	Ref			Ref			Ref		
Strongly agree/agree	1313	70.2	1.34	0.93	1.92	1.27	0.74	2.17	1.60	1.02	2.52
Society disapproves of smoking											
Disagree/strongly disagree/neutral	637	64.8	Ref			Ref			Ref		
Strongly agree/agree	1285	70.5	1.05	0.66	1.64	0.91	0.53	1.58	1.08	0.56	2.08

The dependent variable is intention to quit smoking and it is defined as 1 = having an intention to quit smoking, 0 = having no intention to quit.

Ref: reference value.

The bolded numbers indicate that the difference is significant (tested at 95% significance level).

Analyses: To obtain correct statistical inference, the surveylogistic models were incorporated with design information, including strata (province), primary sampling units (districts), and the rescaled cross-sectional weights. This procedure ensured that the unequal selection probabilities and potential biases created by the multi-stage clustering sampling design of this study were adjusted so that the results were nationally representative. We also tested whether the set of explanatory variables created a multicollinearity problem. We found that the explanatory variables in our final model were weakly correlated, and thus multicollinearity was not an issue of concern.

[a] HSI (nicotine dependence) is not an AOR it is a linear regression coefficient. It shows the mean change in quit intention for one unit of change in nicotine dependence.

showed that they were independently associated with quit intentions. There were five factors that were significantly associated with quit intentions in both countries: being younger (AOR 3.29 [18–24 years]; AOR 1.98 [25–39 years]), having tried to quit previously (AOR 3.63), perceiving that quitting smoking is beneficial to health (AOR 2.23 [moderately beneficial]; AOR 3.72 [very/extremely beneficial]), worrying about future health consequences of smoking (AOR 3.10 [little/ moderately worried]; AOR 4.05 [very worried]), and being low in nicotine dependence (AOR 0.74). Four additional factors were significantly associated with quit intentions in Zambia, but not in Kenya: having a quit attempt lasting six months or more (AOR 9.66), reporting lower smoking enjoyment (AOR 4.13 [Disagree/strongly disagree]; AOR 5.01 [Neutral]), having a negative opinion about smoking (AOR 5.05), and being concerned about cigarette expenses (AOR 1.60). Gender, household income and education were not significantly associated with quit intentions in the multivariate model.

In the third regression analyses the 13 country x independent variable product terms were added to explicitly test whether the strength of predictability of that factor differed by country. Only two of the interaction terms were statistically significant at $p = 0.05$, namely "country*longest time off smoking" ($p = 0.002$), and "country*I enjoy smoking too much to give it up" ($p = 0.0009$). This means that having a past quit attempt lasting 6 months or more was more predictive ($p = 0.002$) of having a quit intention in Zambia (AOR 9.66) than it was in Kenya (AOR 2.54). Smoking enjoyment was much more predictive ($p = 0.0009$) of NOT having a quit intention in Zambia (AOR 4.13) than it was in Kenya (AOR 1.36).

4. Discussion

The study demonstrates that most Kenyan and Zambian smokers are interested in quitting smoking (65.1% and 69.1% respectively). These quit intention rates are higher than those of high- and middle-income ITC countries: Germany (60%), United Kingdom (62%), Mexico (55%), Mauritius (54%), Thailand (37%), and India (16%) but comparable with Uruguay (66%) and France (65%) (ITC Project, 2015a). Five factors (i.e., being younger, having tried to quit previously, perceiving that quitting is beneficial to health, worrying about future health consequences of smoking, and being low in nicotine dependence) were significantly associated with quit intentions in both countries. Four additional factors (i.e., having a quit attempt lasting six months or more, lower smoking enjoyment, having a negative opinion about smoking, and concern about cigarette expenses) were significantly associated with quit intentions in Zambia but not in Kenya.

Consistent with smokers from Mauritius (Kaai et al., 2016), China (Feng et al., 2010) and Western countries (i.e., Australia, Canada, UK, and the USA) (Hyland et al., 2006), smokers who reported having a past quit attempt, preferably lasting more than one month, were more likely to have a quit intention. Previous research has demonstrated that smokers typically require many quit attempts before they are successful (Chaiton et al., 2016) and it is important for those who relapse to continue to make cessation attempts. This study suggests the need to provide Kenyan and Zambian smokers with cessation support (e.g., subsidized nicotine replacement therapies) since they are not covered under any national health insurance. Additionally, the study suggests provision of a national toll-free quitline to support cessation efforts including providing information on the harms of tobacco use and benefits of quitting.

Our findings regarding motivational indicators, such as perceiving that quitting is beneficial to health, and worrying about the health effects of smoking, and attitudinal indicators such as having a negative overall opinion about smoking, and smoking enjoyment were consistent with studies from other countries (Feng et al., 2010; Hyland et al., 2006; Kaai et al., 2016; Wang et al., 2005; Yu et al., 2004). Regular media campaigns addressing the harmful effects of smoking and denormalizing tobacco use are needed to shift social norms in both

countries, especially in Zambia where tobacco advertising is still permitted.

Consistent with studies from the West (i.e., Australia, Canada, UK, and the USA) (Siahpush, 2006) and China (Feng et al., 2010), our study found that the higher the level of nicotine dependence (HSI) the less likely that a smoker would intend to quit. Results support tailored cessation programs that encourages less nicotine dependent smokers to quit smoking, while those highly addicted to smoking will be first motivated to reduce consumption to increase their chances of succeeding in making quit intentions and attempts and finally quitting the habit (West, 2000).

Our study found that Zambian smokers who thought that they spend too much money on cigarettes were more likely to intend to quit. More detailed ITC analyses on affordability and price effects in Kenya and Zambia showed that tobacco products were affordable and price was the least mentioned reason of smokers thinking about quitting (ITC Project, 2015c, 2015a). Therefore, tax increases on cigarettes (including reduction of between-product price differences to discourage switching to cheaper tobacco alternatives like roll-your-own tobacco especially in Zambia) in accordance with Article 6 of the FCTC would be an important measure for both countries to encourage cessation (Stoklosa et al., 2018; WHO FCTC, 2005). Funds from taxation, such as the SIN Tax in Philippines (Bellew et al., 2013; Kaiser et al., 2016; Prabhat et al., 2012) and Thailand (Buasai et al., 2007) could be dedicated to increase access to cessation interventions, e.g., training health providers to offer brief cognitive-behavioural counselling and drug therapy.

Smoking cessation needs to be included in the educational curriculum of medical and other healthcare providers because a meta-analysis of 10 studies (Carson et al., 2012) showed that providers who have received smoking cessation training are significantly more likely to intervene with patients who use tobacco than those not trained. Creating a planned approach to stop smoking campaigns, and highlighting cessation on World No Tobacco Days are also important. Strengthening community participation would be beneficial as was done in countries like Fiji, India and South Africa, where community volunteers were trained to deliver effective smoking cessation programmes and simple advice in their villages (Abdullah and Husten, 2004). Other strategies include integrating smoking cessation services with other primary care services similar to interventions for other chronic diseases like HIV (Abdullah and Husten, 2004).

Four additional factors were significant predictors in Zambia but not Kenya. Further studies need to be done to tease out the reason for the country difference. Two plausible explanations for the difference could be: (1) differences in tobacco product use or preferences between the two countries, e.g., 42% of Zambian smokers use roll-your-own (RYO) cigarettes, while 87% of Kenyan smokers mainly smoke factory-made cigarettes (only 12% use RYO cigarettes), and (2) differences in the number of FCTC policies that have been implemented and level of enforcement in both countries as described in the introduction section. This latter explanation highlights the need for stronger tobacco control measures to encourage cessation.

Strengths of this study include the use of population-based data and inclusion of known standardised measures associated with quit intentions, which have been used in 29 countries participating in the ITC Project. Additionally, this is the first study to explicitly test whether predictors of quit intentions differed across countries in Africa. The limitations of this study include the use of cross-sectional analyses, which limits the ability to determine causality and the survey relied on self-reports, which can result in recall bias.

5. Conclusion

This is the first population-based study to compare the factors associated with quit intentions among smokers in two African countries. Five factors were significantly associated with quit intentions in both

countries: being younger, having tried to quit previously, perceiving that quitting is beneficial to health, worrying about future health consequences of smoking, and being low in nicotine dependence. Four additional factors were significant predictors in Zambia only: having a quit attempt lasting six months or more, lower smoking enjoyment, having a negative opinion about smoking, and concern about cigarette expenses. The factors predicting quit intentions were similar to those in other ITC countries. The results of this study highlight the need for cessation services to support the high proportion of smokers who are intending to quit smoking in Kenya and Zambia in the context of other broader tobacco control policies (e.g., smoke-free) and prevention services like anti-smoking media campaigns. Given the lack of research and the heterogeneity in tobacco control policies across Africa, there is a need for further research from other African countries to provide guidance on what policies and programs may be most likely to promote quitting among smokers in this region of the world where tobacco epidemic is growing (CTFK, 2017).

Declaration of Competing Interest

Contributor statement

GTF, FG, LI, and JRO were involved in the design of the study. SCK and GM were responsible for the data analyses reported in this paper. SCK, TEM, and GM wrote the paper with contribution from GTF, FG, JRO, and LI. All authors approved the final manuscript.

Ethical clearance

The study protocol and all procedures for the ITC Zambia and Kenya Surveys were reviewed and cleared for ethics by the Human Research Ethics Committee at the University of Waterloo (Canada), the University of Zambia Research Ethics Committee (Zambia), and the Kenyatta National Hospital/University of Nairobi Ethics Review Committee (Kenya). All participants provided consent to participate.

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