



Cigarette smoking and misperceived norms among adults in rural Uganda: a population-based study

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Abstract

Background: Little is known about perceived norms about cigarette smoking in Uganda or the extent to which perceptions drive personal cigarette smoking behavior.

Methods: We conducted a cross-sectional study in 2016–2018 that targeted all adults who resided within 8 villages in Rwampara District, southwestern Uganda. Personal cigarette smoking frequency was elicited by self-report. We also asked participants what they believed to be the

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cigarette smoking frequency of most other adult men and women in their villages (i.e., perceived norms). Frequent cigarette smoking was defined as 4+ times/week. We compared perceived norms to cigarette smoking frequency reports aggregated at the village level. We used multivariable Poisson regression to estimate the association between perceived norms and personal cigarette smoking behavior.

Results: Among 1626 participants (91% response rate), 92 of 719 men (13%) and 6 of 907 women (0.7%) reported frequent smoking. However, 1030 (63%) incorrectly believed most men in their villages smoked cigarettes frequently. Additionally, 116 (7%) incorrectly believed that most women in their villages smoked cigarettes frequently. These misperceptions were pervasive across social strata. Men who misperceived frequent cigarette smoking as the norm among other men in their villages were more likely to smoke frequently themselves (adjusted relative risk=1.49; 95% CI, 1.13 to 1.97).

Conclusions: Most adults overestimated cigarette smoking frequency among village peers. Men who incorrectly believed that frequent smoking was the norm were more likely to engage in frequent smoking themselves. Applying a 'social norms approach' intervention by promoting existing healthy norms may prevent smoking initiation or motivate reductions in smoking among men in rural Uganda.

Keywords

social norms; social networks; descriptive norms; substance use; tobacco

INTRODUCTION

In 2016, 9.7% of men and 0.8% of women aged 15–49 years in rural Uganda smoked cigarettes.[1] Treatment and support for smoking cessation in sub-Saharan Africa are limited.[2] Novel interventions to reduce cigarette smoking and prevent smoking initiation, especially among men, are needed.

Emerging literature from sub-Saharan Africa suggests that people often overestimate the extent to which health risk behaviors are normative.[3–9] These studies find that misperceptions of social norms may affect personal health and health risk behaviors. In high-income countries, studies in educational contexts have found that misperceived norms among abstainers are associated with substance use initiation and intention to initiate.[10–12] Misperceived norms also contribute to greater substance use frequency and quantity among current users.[13–17]

While sex, age, education, peers, and place are correlates of smoking,[18, 19] the extent to which misperceived norms about cigarette smoking drive personal smoking behavior has not been studied within general population samples in sub-Saharan Africa. For this study, we assessed personal frequency of cigarette smoking among adults in rural Uganda and their misperceptions of cigarette smoking norms among men and women in their villages.

METHODS

Study design

We conducted a cross-sectional study targeting all adults aged 18+ years who resided across eight contiguous villages in rural, southwestern Uganda in 2016–2018. This context represents an agricultural and small-scale trading/enterprise economy, has substantial household food and water insecurity, and has little access to electricity and piped water, all of which are common across rural Uganda.[1, 20–22] After participants provided informed consent, research assistants administered a survey to collect health-related data. The survey also entailed asking participants to name residents within the parish with whom they interacted for different purposes.[23, 24] Nominated residents were also eligible study participants,[25] thus permitting data linkage between participants and their direct contacts (i.e., their personal network).

This study was approved by the Partners Human Research Committee at Massachusetts General Hospital; the Research Ethics Committee at Mbarara University of Science and Technology; and the Vanderbilt Human Research Protections Program. We also received clearance from the Uganda National Council of Science and Technology and the Research Secretariat in the Office of the President of the Republic of Uganda.

Measures

One item elicited the last time a participant had smoked cigarettes. Response options included never, more than 5 years ago, 1–5 years ago, and sometime within the past 12 months. If a participant had smoked in the past 12 months, then a follow-up item elicited the participant's current frequency of smoking. Response options included once a month, 2–4 times per month, 2–3 times per week, and 4 times per week. We defined occasional smoking as smoking at least once a month, but < 4 times per week and frequent smoking as 4 times per week.

The explanatory variables of interest, perceived norms about cigarette smoking, were assessed using two items: “According to your perception, which of the following answers best describes how often during the past 12 months most other men aged 18 years or older who stay in your village smoked cigarettes?” Response options included never in their lives, never in the past 12 months, once a month, 2–4 times per month, 2–3 times per week, and 4 times per week. A similarly worded question was used to elicit perception about cigarette smoking among women, but with reference to most other adult women in the village. Survey pretesting suggested “most other adult men/women in your village,” was an easily understood social reference group.[26] To assess the extent of misperceived norms, we compared participants' perceptions to what > 50% of men in their village self-reported as their cigarette smoking frequency and what > 50% of women in their village self-reported as their cigarette smoking frequency.[3, 7, 15, 27, 28]

Other variables assessed were age, sex, religion, marital status, primary school completion, household asset wealth quintile,[29] direct contacts' self-reported cigarette smoking behavior, HIV status, and positive symptom screen for depression (measured using a locally adapted version of the Hopkins Symptom Checklist [30]). We included HIV status and

depression in this study given prior findings showing that cigarette smoking behavior is more prevalent among people with depression and HIV in different settings.[31–33]

Statistical analysis

We tabulated perceived norms across subgroups and fitted multivariable Poisson regression models with cluster-correlated robust estimates of variance to adjust for clustering at the village level. Frequent cigarette smoking was specified as the outcome variable. This model yields estimated incidence rate ratios that can be interpreted straightforwardly as relative risk ratios.[34] The primary explanatory variable was whether or not the participant misperceived frequent cigarette smoking as normative. The model also adjusted for the other variables described above. We also conducted an e-value sensitivity analysis to estimate the minimum strength of association, on the risk ratio scale, that an unobserved confounder would need to have with both norm misperception and individual behavior to explain away the estimated association.[35, 36]

RESULTS

Across the eight villages ranging in size from 130 to 248 adults, 1626 of all 1795 adult residents were interviewed (91% response rate; <1% of responses were missing). Mean age was 40 years (s.d.=17). Average number of direct network contacts was 5.2 (s.d.=2.7). Most participants (975 [60%]) had completed primary school or more; 993 [61%] were married/cohabiting; and most identified as Protestant (1130 [70%]) or Catholic (385 [24%]).

Among 719 men, 481 (67%) had never smoked cigarettes and 131 (18%) had smoked more than a year ago. Among 907 women, 841 (93%) had never smoked cigarettes and 56 (6%) had smoked more than a year ago. In the past 12 months, 15 (2%) men and 2 (0.2%) women had smoked occasionally and 92 (15%) men and 6 (<0.7%) women had smoked frequently. These 115 smokers represented 111 households.

In every village, more than 50% of adults reported never smoking. Similarly, most participants (1445 [89%]) had a personal network where >50% of participants' direct network contacts reported never smoking. Moreover, 1250 [77%] participants had no current smokers in their personal network.

Despite non-smoking behavior being the norm, 1030 participants (63%) incorrectly believed that most men in their villages smoked cigarettes frequently and 138 (8%) incorrectly believed that most men smoked occasionally. An additional 131 (8%) thought most men had smoked in their lifetime but had done so more than a year ago. Across subgroups, most participants misperceived frequent cigarette smoking as the norm among men (Table 1). While most participants (1080 [66%]) thought most women had never smoked cigarettes, 116 (7%) incorrectly believed that most women smoked frequently, 112 (7%) incorrectly believed most smoked occasionally, and 224 (14%) incorrectly thought most women had smoked in their lifetime but had done so more than a year ago.

As smoking among women was exceedingly rare, we fitted the multivariable Poisson regression model using data from men only (n=702). Men who misperceived that frequent

cigarette smoking was the norm among men in their villages were more likely to smoke cigarettes frequently themselves (unadjusted relative risk = 1.54; 95% confidence interval (CI), 1.23–1.94, $P < 0.001$ and adjusted relative risk = 1.49; 95% CI, 1.13–1.97, $P = 0.005$). The *e*-value corresponding to the adjusted estimate was 2.34. An unobserved confounder would need to have an association with norm misperception and with cigarette smoking of 2.34, on the risk ratio scale, when adjusting for the same factors to explain away the association observed in our study. Other factors associated with frequent smoking among men included older age, being married, being in the poorest household wealth quintile (compared to the least poor), and having a direct network contact who reported frequent smoking (online Supplemental Table 1).

DISCUSSION

In this population-based network study of adults in rural Uganda, most men and women did not smoke cigarettes. However, most participants incorrectly believed frequent cigarette smoking was the norm among men. While relatively fewer adults incorrectly believed cigarette smoking was the norm among women, overestimating the extent to which most women smoked cigarettes was still present. Misperceiving the norm about cigarette smoking was strongly correlated with individual cigarette smoking behavior among men adjusting for sociodemographic, health, and network exposure factors. This estimated association was statistically significant, large in magnitude, and robust to potential confounding by unobserved variables.

Our findings are consistent with prior work showing that adolescents and young adults in high-income countries tend to misperceive norms about substance use.[28, 37, 38] We extend this research by demonstrating the pervasiveness and potential influence of misperceived norms about cigarette smoking in a general population sample of adults from Uganda. Results highlight an opportunity to correct norm misperceptions and perhaps prevent or reduce cigarette smoking using the “social norms approach”.[39] This class of intervention emphasizes dissemination of messages that highlight existing positive norms among recognizable social reference groups. For example, “Most single men/women in your village have never smoked cigarettes”, “85% of men in your parish have not smoked in the past year” and “Most men in your personal social networks in this parish do not smoke cigarettes”. Studies from high-income settings have shown that correcting misperceived norms has led to reductions in substance use and prevented risk behavior initiation.[37, 40–43] Emphasizing actual non-smoking norms may help build support for Uganda’s national smoke-free law.[44]

Personal cigarette smoking frequency may be under-reported. However, past-year smoking would need to be under-reported by a factor of about 3–5 for underreporting to result in misclassifying the norm about cigarette smoking. Lesser degrees of under-reporting would not have affected our estimates. Further research is needed to assess the extent to which misperceived norms about smoking behavior among relevant peer groups affect personal cigarette smoking behavior over time within this context.

CONCLUSION

In this population-based study of cigarette smoking across eight villages in rural Uganda, we found that most adults incorrectly believed frequent cigarette smoking was the norm among men and that this misperception was strongly associated with personal cigarette use among men. Social norms interventions communicating accurate local norms (i.e., most men in this village do not smoke) may help prevent initiation among non-smokers and reduce frequency of use among current smokers in rural Uganda. Correcting misperceptions about cigarette smoking norms could be a novel addition to tobacco control interventions and would support national efforts in Uganda to prohibit smoking in the workplace and other public spaces. People may be more likely to support and adhere to non-smoking policies and encourage others to do so if provided with the information that most people in their communities do not (contrary to their perception) smoke. Additionally, information about local norms of abstinence could be routinely included as part of tobacco use screening interventions and in substance use education programs for youth and young adults.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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What this paper adds

- Youth and young adults in educational settings often overestimate the extent of cigarette smoking among peers.
- Perceptions about others' substance use behaviors can influence personal substance use behaviors.
- No research has assessed the extent to which general population adults in Uganda misperceive norms about cigarette smoking among local peers.
- No studies have estimated the extent to which perceived norms about cigarette smoking drive personal cigarette smoking behavior among adults in sub-Saharan Africa.
- Men and women in rural Uganda misperceived frequent cigarette smoking to be the behavioral norm among men and women in their villages.
- Misperceiving frequent cigarette smoking as the norm among men was associated with personally smoking cigarettes frequently among men in rural Uganda.

Table 1.

Cigarette smoking behavior and misperceiving the norm about most others' smoking behavior among all men and all women across eight villages in Rwampara district, Southwest Uganda (N=1,626).

	Study Population		Reported smoking cigarettes 4 times per week		Misperceived cigarette smoking 4 times per week as the norm among men in own village		Misperceived cigarette smoking 4 times per week as the norm among women in own village	
	N	(%)	n	(%)	n	(%)	n	(%)
Sex								
Male	719	(44%)	92	(13%)	448	(62%)	34	(5%)
Female	907	(56%)	6	(1%)	582	(64%)	82	(9%)
Age								
18–29 years	533	(33%)	8	(2%)	349	(65%)	35	(7%)
30–39 years	364	(23%)	27	(7%)	239	(66%)	33	(9%)
40–49 years	292	(18%)	20	(7%)	183	(63%)	26	(9%)
50+ years	413	(26%)	39	(9%)	243	(59%)	22	(5%)
Marital status								
Not married or cohabiting	632	(39%)	38	(6%)	407	(64%)	46	(7%)
Married or cohabiting as if married	993	(61%)	60	(6%)	623	(63%)	70	(7%)
Cigarette smoking behavior of direct network contacts								
No direct contacts smoked in the past 12 months	1250	(77%)	43	(3%)	771	(62%)	88	(7%)
1+ direct contact(s) smoked occasionally or frequently in the past 12 months	376	(23%)	55	(15%)	259	(69%)	28	(7%)
Education								
None / some primary	651	(40%)	55	(8%)	439	(67%)	52	(8%)
Completed primary education or more	975	(60%)	43	(4%)	591	(61%)	64	(7%)
Household asset wealth								
1st quintile (poorest)	326	(20%)	46	(14%)	226	(69%)	37	(11%)
2nd quintile	324	(20%)	22	(7%)	210	(65%)	25	(8%)
3rd quintile	324	(20%)	7	(2%)	209	(65%)	15	(5%)
4th quintile	326	(20%)	11	(3%)	203	(62%)	22	(7%)
5th quintile (least poor)	326	(20%)	12	(4%)	182	(56%)	17	(5%)
Religion								
Protestant	1130	(69%)	67	(6%)	709	(63%)	69	(6%)

	Study Population		Reported smoking cigarettes 4 times per week		Misperceived cigarette smoking 4 times per week as the norm among men in own village		Misperceived cigarette smoking 4 times per week as the norm among women in own village	
	N	(%)	n	(%)	n	(%)	n	(%)
Catholic	385	(24%)	30	(8%)	248	(64%)	38	(10%)
Muslim	19	(1%)	1	(5%)	13	(68%)	2	(11%)
Born again Pentecostal	86	(5%)	0	(0%)	58	(67%)	7	(8%)
Other	6	(0%)	0	(0%)	2	(33%)	0	(0%)
Depression screening								
No indicators of depression	1295	(80%)	82	(6%)	795	(61%)	73	(6%)
Probable depression	331	(20%)	16	(5%)	235	(71%)	43	(13%)
Self-reported HIV serostatus								
HIV negative or unknown HIV status	1459	(90%)	85	(6%)	919	(63%)	97	(7%)
HIV positive	167	(10%)	13	(8%)	111	(66%)	19	(11%)