



Published in final edited form as:

AIDS Care. 2014 ; 26(9): 1201–1207. doi:10.1080/09540121.2014.892565.

Healthcare provider intervention on smoking and quit attempts among HIV-positive versus HIV-negative MSM smokers in Chengdu, China

Carla J. Berg^{a,b}, Eric J. Nehl^a, Xiaodong Wang^c, Yingying Ding^d, Na He^{a,d,*}, Brent A. Johnson^e, and Frank Y. Wong^{a,b}

^aDepartment of Behavioral Sciences & Health Education, Rollins School of Public Health, Emory University, Atlanta, GA, USA

^bHubert Department of Global Health, Rollins School of Public Health, Emory University, Atlanta, GA, USA

^cChengdu Tongle Health Service and Counseling Center, Chengdu, PR China

^dDepartment of Epidemiology, School of Public Health, Fudan University, Shanghai, China

^eDepartment of Biostatistics and Bioinformatics, Rollins School of Public Health, Emory University, Atlanta, GA, USA

Abstract

Given the implications for smoking among HIV-positive individuals and high smoking and HIV rates among men who have sex with men (MSM) in China, we examined sociodemographic, smoking-related, psychosocial, and substance use factors in relation to HIV status; receiving some sort of healthcare provider intervention regarding smoking; and having made a quit attempt in the past year in a sample of MSM smokers in Chengdu. We conducted a cross-sectional survey of 381 MSM smokers recruited by a nongovernmental organization in Chengdu in 2012–2013. Of these, 350 disclosed their HIV status and 344 (188 HIV-positive and 156 HIV-negative) provided completed data. Half (50.0%) reported at least one quit attempt in their lifetime; 30.5% reported a quit attempt in the past year. The majority (59.4%) reported that a healthcare provider had intervened in some way (assessed smoking, advised quitting, provided assistance), most commonly by assessing smoking status (50.0%). HIV-positive individuals were more likely to report a healthcare provider intervening on their smoking ($p < .001$). Those who received provider intervention were more likely to have attempted to quit ever ($p = .009$) and in the past year ($p < .001$). Those HIV-positive were more likely to have attempted to quit since diagnosis if a provider had intervened ($p = .001$). Multivariate regression documented that being HIV-positive ($p < .001$), greater cigarette consumption ($p = .02$), less frequent drinking ($p = .03$), and greater depressive symptoms ($p = .003$) were significant correlates of healthcare provider intervention. Multivariate regression also found that healthcare provider intervention ($p = .003$), older age ($p = .01$), and higher autonomous motivation ($p = .007$) were significant correlates of attempting to quit in the past year. Given the impact of healthcare provider intervention regarding smoking on quit

attempts among MSM, greater training and support is needed to promote consistent intervention on smoking in the clinical setting among HIV-positive and HIV-negative MSM smokers.

Keywords

HIV; men who have sex with men; smoking; smoking cessation; healthcare provider

Introduction

Smoking rates in China are high (Yang, 2008); roughly 56% of men and 6% of women are current smokers (Lee et al., 2009). Men who have sex with men (MSM) are at high risk for smoking (Greenwood et al., 2005; Lampinen, Bonner, Rusch, & Hogg, 2006; McKirnan, Tolou-Shams, Turner, Dyslin, & Hope, 2006; Tang et al., 2004), but limited research has examined smoking among MSM in developing countries. One study of MSM in Shanghai, China documented a 66% smoking prevalence (Berg et al., 2011). Reasons for these elevated risks might include higher stress or depression, discrimination, and lack of social support (Choi et al., 2003; Liu & Choi, 2006; Pilcher, 2003). In addition, behaviors associated with smoking, such as alcohol use (Shiffman & Wills, 1985), may be higher among MSM (Greenwood et al., 2001; Stall, Greenwood, Acree, Paul, & Coates, 1999; Wong et al., 2008).

MSM are at increased risk for HIV/AIDS (Centers for Disease Control and Prevention [CDC], 2009). Smoking rates are high among HIV-positive individuals (Mamary, Bahrs, & Martinez, 2002; Niaura, Shadel, Morrow, Flanigan, & Abrams, 1999). Unfortunately, smoking is associated with reduced health-related quality of life in HIV-positive individuals and increased incidence of AIDS-defining illnesses, malignancies, and mortality (Crothers et al., 2005; Kirk et al., 2007; Kohli, Lo, & Homel, 2006; Miguez-Burbano, Ashkin, & Rodriguez, 2005), and disease progression (Abbud, Finegan, Guay, & Rich, 1995; Nieman, Fleming, Coker, Harris, & Mitchell, 1993). Unfortunately, HIV-positive smokers may be less likely to quit and less motivated to quit (Gritz, Vidrine, Lazev, Amick, & Arduino, 2004; Niaura et al., 1999). Thus, targeting smoking cessation among MSM, particularly those already infected with HIV, is critical. Physician-assisted smoking intervention is effective (Coleman, 2004; Schroeder, 2005; Stead, Bergson, & Lancaster, 2008a, 2008b; The Tobacco Use and Dependence Clinical Guideline Panel and Consortium Representatives, 2000); however, Chinese doctors infrequently offer cessation services and lack cessation resources (Jiang, Elton-Marshall, Fong, & Li, 2010; Li, Fish, & Zhou, 1999; Smith & Leggat, 2007).

The current study is the first to examine sociodemographic, smoking-related, psychosocial, and substance use factors in relation to HIV status; receipt of healthcare provider intervention regarding smoking; and having made a recent (past 12 months) quit attempt in a sample of MSM current (past 30 days) smokers in Chengdu, Sichuan Province, China.

Methods

Procedures

Using a cross-sectional design, we recruited a convenience sample of MSM through a nongovernmental organization in Chengdu that serves MSM to participate in a 15-minute self-administered paper-and-pencil survey between November 2012 and March 2013. Eligibility criteria included 18 years old, able to give consent (in Mandarin Chinese), ever had sex with men (oral, anal, or both), smoked 100 cigarettes in his lifetime, and smoked 1 cigarette in the past 30 days. The sample was comprised of 381 MSM, of whom 350 disclosed their HIV status, and 344 (188 HIV-positive, 156 HIV-negative) provided complete data. This study was approved by the Institutional Review Board at Fudan University.

Measures

All measures were translated and back-translated using previously published procedures yielding valid measures (He et al., 2007; Wong et al., 2008). Participants reported sociodemographics; smoking-related factors (number of days of smoking in the past 30 days, average cigarettes smoked per day [cpd; CDC, 2012]); social factors (living with a smoker, number of five closest friends that smoke [Maibach, Maxfield, Ladin, & Slater, 1996]); days of alcohol consumption in the past 30 (CDC, 2012); depressive symptomatology per the Center for Epidemiologic Studies Depression Scale-Short Form (CES-D) (Poulin, Hand, & Boudreau, 2005; Cronbach's alpha = .94); and the Treatment Self-Regulation Questionnaire (TSRQ; Ryan & Connell, 1989; Williams et al., 2006) assessing autonomous motivation (e.g., "...I want to take responsibility for my own health"), controlled motivation (e.g., "I would feel guilty or ashamed of myself if I smoked"), and amotivation (i.e., "I really don't think about it") (Cronbach's alphas = .84, .80, and .57, respectively).

Participants reported if they had ever been tested for HIV and, if they were, the result of the test. Participants were asked if any healthcare provider had ever assessed their smoking status; advised to quit; or provided assistance or resources for cessation. We created one factor indicating at least one versus none of these interventions. Finally, participants reported number of quit attempts in their lifetime, in the past 12 months (Fava, Velicer, & Prochaska, 1995), and among HIV-positive individuals, since HIV diagnosis.

Data analyses

Descriptive analyses were conducted; z-score transformations were done to address skewed continuous variables (in this case, days of alcohol consumption) for inclusion in regression models. Bivariate analyses examined correlates of HIV status; receipt of healthcare provider intervention; and recent quit attempt. We then conducted two binary logistic regression models. The first examined factors associated with having received provider intervention, with HIV status being the primary predictor of interest. The second examined factors associated with recent quit attempt; HIV status and provider intervention were the primary predictors of interest. In each model, important sociodemographics, cigarette consumption (days smoked multiplied by cpd), and the primary predictors of interest were forced into the

model; we performed backward deletion on all other factors and retained those significant at the nominal level. Prevalence ratios were computed using a Poisson likelihood and log link function, but statistical inference was drawn using the robust, empirical covariance matrix (Zou, 2004). SPSS 21.0 and SAS 9.3 were used for all data analyses. Statistical significance was set at $\alpha = .05$.

Results

Our sample smoked an average of 21.88 (SD = 10.35) days of the past 30 and an average of 11.97 (SD = 9.73) cpd (Table 1). The median number of days of alcohol consumption was 2.00 days (interquartile range: 0.00, 5.00). The majority (59.4%) reported that a healthcare provider had intervened; the most common intervention was assessment of smoking status (50.0%). Half (50.0%) reported at least one quit attempt in their lifetime; 30.5% reported a recent quit attempt.

HIV-positive individuals were of greater educational attainment ($p < .001$), had higher incomes ($p = .004$), drank less frequently ($p = .03$), were less likely to live with another smoker ($p = .01$), had fewer friends that smoke ($p < .001$), were more likely to receive healthcare provider intervention ($p < .001$), and were more likely to have ever attempted to quit ($p = .01$).

Receiving healthcare provider intervention was associated with greater educational attainment ($p = .009$), higher incomes ($p = .002$), more frequent smoking and higher cpd ($p = .03$), less frequent drinking ($p = .03$), less likelihood of living with another smoker ($p = .005$), greater depressive symptoms ($p = .02$), and greater likelihood of trying to quit ever ($p = .009$), in the past year ($p < .001$), and among HIV-positive individuals, since HIV diagnosis ($p = .001$). Regression documented that being HIV-positive ($p < .001$), greater cigarette consumption ($p = .02$), less frequent drinking ($p = .03$), and greater depressive symptoms ($p = .003$) were correlated with healthcare provider intervention (Table 2).

Having made a recent quit attempt was associated with being older ($p = .01$), educational attainment ($p = .04$), income level ($p = .004$), greater likelihood of being married or living with a partner ($p = .02$), greater likelihood of living with other smokers ($p = .004$), higher depressive symptoms ($p = .01$), and greater controlled ($p = .01$) and autonomous motivation ($p < .001$). Regression documented that receiving provider intervention ($p = .003$), older age ($p = .01$), and higher autonomous motivation ($p = .007$) was associated with recent quit attempts (Table 3).

Discussion

We documented low rates of lifetime or recent quit attempts (50% and 30%, respectively) and low rates of providers ever intervening on smoking (60%) in this sample. HIV-positive individuals were more likely to have ever attempted to quit or to have had a provider intervene regarding smoking. Given the health benefits of cessation (Chaisson, 1994), particularly among HIV-positive MSM (Abbud et al., 1995; Nieman et al., 1993), these findings highlight the need for consistent provider cessation intervention among MSM in China.

Moreover, there were few differences in the smoking or psychosocial profiles of HIV-positive and HIV-negative MSM smokers in this sample. HIV-positive individuals were of greater socioeconomic status, drank less frequently, were less likely to live with another smoker, and had fewer friends who smoke, potentially indicating better odds of successful cessation, given that alcohol consumption and greater pro-smoking social factors decrease the odds of successful cessation (Baker et al., 2006; Chen, White, & Pandina, 2001; Gilman, Abrams, & Buka, 2003). Predictors of receiving healthcare provider intervention included being HIV-positive, less frequent drinking, and greater depressive symptoms. Predictors of having made a recent quit attempt included having received some healthcare provider intervention, further highlighting the critical need for healthcare providers to have the appropriate training and support to intervene. Other significant predictors included higher autonomous motivation, which coincides with existing literature (Cupertino et al., 2012; Williams et al., 2006, 2002).

Limitations of this study include a lack of generalizability, given that this was a convenience sample recruited through a nonprofit organization in Chengdu and were overrepresented by HIV-positive MSM. The cross-sectional nature of the data does not allow us to detect directionality of the relationships documented.

In summary, HIV-positive individuals were more likely to have a doctor intervene on smoking, which was related to having made a recent quit attempt. This highlights the important role of healthcare providers in promoting cessation in this population.

Acknowledgments

The study was approved by Fudan University's Institutional Review Board. We would also like to thank our community partner, Chengdu Tongle Health Service and Counseling Center, for their efforts and support in conducting this research.

Funding: This study was supported by a grant from the Emory Center for AIDS Research [grant number P30 AI050409] to Drs Berg, Nehl and Wong and the Georgia Cancer Coalition (PI: Berg). All opinions expressed are those of the authors.

References

- Abbud RA, Finegan CK, Guay LA, Rich EA. Enhanced production of human immunodeficiency virus type 1 by in vitro-infected alveolar macrophages from otherwise healthy cigarette smokers. *Journal of Infectious Diseases*. 1995; 172:859–863.10.1093/infdis/172.3.859 [PubMed: 7658083]
- Baker A, Ivers RG, Bowman J, Butler T, Kay-Lambkin FJ, Wye P, Wodak A. Where there's smoke, there's fire: High prevalence of smoking among some subpopulations and recommendations for intervention. *Drug and Alcohol Review*. 2006; 25(1):85–96.10.1080/09595230500459552 [PubMed: 16492581]
- Berg CJ, Nehl EJ, Wong FY, He N, Huang ZJ, Ahluwalia JS, Zheng T. Prevalence and correlates of tobacco use among a sample of MSM in Shanghai, China. *Nicotine and Tobacco Research*. 2011; 13(1):22–8.10.1093/ntr/ntq193 [PubMed: 21059821]
- Centers for Disease Control and Prevention. HIV and AIDS among gay and bisexual men, CDC Fact Sheet. Atlanta, GA: Author; 2009.
- Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System, 2011. Atlanta, GA: Author; 2012.
- Chaisson RE. Smoking cessation in patients with HIV. *Journal of the American Medical Association*. 1994; 272:564. [PubMed: 8046815]

- Chen PH, White HR, Pandina RJ. Predictors of smoking cessation from adolescence into young adulthood. *Addictive Behaviors*. 2001; 26(00):517–529. 00142–8.10.1016/S0306-4603 [PubMed: 11456075]
- Choi KH, Liu H, Guo Y, Han L, Mandel JS, Rutherford GW. Emerging HIV-1 epidemic in China in men who have sex with men. *The Lancet*. 2003; 361:2125–2126.10.1016/S0140-6736(03)13690-2
- Coleman T. ABC of smoking cessation: Use of simple advice and behavioural support. *British Medical Journal*. 2004; 328:397–399.10.1136/bmj.328.7436.397 [PubMed: 14962878]
- Crothers K, Griffith TA, McGinnis KA, Rodriguez-Barradas MC, Leaf DA, Weissman S, Justice AC. The impact of cigarette smoking on mortality, quality of life, and comorbid illness among HIV-positive veterans. *Journal of General Internal Medicine*. 2005; 20:1142–1145.10.1111/j.1525-1497.2005.0255.x [PubMed: 16423106]
- Cupertino AP, Berg C, Gajewski B, Hui SK, Richter K, Catley D, Ellerbeck EF. Change in self-efficacy, autonomous and controlled motivation predicting smoking. *Journal of Health Psychology*. 2012; 17:640–652.10.1177/1359105311422457 [PubMed: 22076554]
- Fava JL, Velicer WF, Prochaska JO. Applying the transtheoretical model to a representative sample of smokers. *Addictive Behaviors*. 1995; 20:189–203.10.1016/0306-4603(94)00062-X [PubMed: 7484313]
- Gilman SE, Abrams DB, Buka SL. Socioeconomic status over the life course and stages of cigarette use: Initiation, regular use, and cessation. *Journal of Epidemiology and Community Health*. 2003; 57:802–808.10.1136/jech.57.10.802 [PubMed: 14573586]
- Greenwood GL, Paul JP, Pollack LM, Binson D, Catania JA, Chang J, Stall R. Tobacco use and cessation among a household-based sample of US urban men who have sex with men. *American Journal of Public Health*. 2005; 95:145–151.10.2105/AJPH.2003.021451 [PubMed: 15623875]
- Greenwood GL, White EW, Page-Shafer K, Bein E, Osmond DH, Paul J, Stall RD. Correlates of heavy substance use among young gay and bisexual men: The San Francisco Young Men's Health Study. *Drug and Alcohol Dependence*. 2001; 61(2):105–112.10.1016/S0376-8716(00)00129-0 [PubMed: 11137274]
- Gritz ER, Vidrine DJ, Lazev AB, Amick BC III, Arduino RC. Smoking behavior in a low-income multiethnic HIV/AIDS population. *Nicotine and Tobacco Research*. 2004; 6(1):71–77.10.1080/14622200310001656885 [PubMed: 14982690]
- He N, Wong FY, Huang ZJ, Ding Y, Fu C, Smith BD, Jiang Q. HIV risks among two types of male migrants in Shanghai, China: money boys vs. general male migrants. *AIDS*. 2007; 21:S73–79.10.1097/01.aids.0000304700.85379.f3 [PubMed: 18172395]
- Jiang Y, Elton-Marshall T, Fong GT, Li Q. Quitting smoking in China: Findings from the ITC China Survey. *Tobacco Control*. 2010; 19:i12–i17.10.1136/tc.2009.031179 [PubMed: 20935194]
- Kirk GD, Merlo C, P OD, Mehta SH, Galai N, Vlahov D, Engels EA. HIV infection is associated with an increased risk for lung cancer, independent of smoking. *Clinical Infectious Diseases*. 2007; 45(1):103–110.10.1086/518606 [PubMed: 17554710]
- Kohli R, Lo Y, Homel P. Bacterial pneumonia, HIV therapy, and disease progression among HIV-infected women in the HIV Epidemiologic Research (HER) Study. *Clinical Infectious Diseases*. 2006; 43:90–98.10.1086/504871 [PubMed: 16758423]
- Lampinen TM, Bonner SJ, Rusch M, Hogg RS. High prevalence of smoking among urban-dwelling Canadian men who have sex with men. *Journal of Urban Health*. 2006; 83:1143–1150.10.1007/s11524-006-9125-7 [PubMed: 17115323]
- Lee S, Guo WJ, Tsang A, Huang YQ, He YL, Kessler RC. Prevalence and correlates of active and ever-smokers in metropolitan China. *Addictive Behaviors*. 2009; 34:969–972.10.1016/j.addbeh.2009.05.005 [PubMed: 19493629]
- Li HZ, Fish D, Zhou X. Increase in cigarette smoking and decline of anti-smoking counselling among Chinese physicians: 1987–1996. *Health Promotion International*. 1999; 14(2):123–131.10.1093/heapro/14.2.123
- Liu JX, Choi K. Experiences of social discrimination among men who have sex with men in Shanghai, China. *AIDS and Behavior*. 2006; 10:S25–33.10.1007/s10461-006-9123-5 [PubMed: 16715344]

- Maibach EW, Maxfield A, Ladin K, Slater M. Translating health psychology into effective health communication. *Journal of Health Psychology*. 1996; 1:261–277.10.1177/135910539600100302 [PubMed: 22011991]
- Mamary EM, Bahrs D, Martinez S. Cigarette smoking and the desire to quit among individuals living with HIV. *AIDS Patient Care STDS*. 2002; 16(1):39–42.10.1089/108729102753429389 [PubMed: 11839217]
- McKirman DJ, Tolou-Shams M, Turner L, Dyslin K, Hope B. Elevated risk for tobacco use among men who have sex with men is mediated by demographic and psychosocial variables. *Substance Use and Misuse*. 2006; 41:1197–1208.10.1080/10826080500514503 [PubMed: 16798685]
- Miguez-Burbano MJ, Ashkin D, Rodriguez A. Increased risk of *Pneumocystis carinii* and community-acquired pneumonia with tobacco use in HIV disease. *International Journal of Infectious Disease*. 2005; 9:208–217.10.1016/j.ijid.2004.07.010
- Niaura R, Britt DM, Borrelli B, Shadel WG, Abrams DB, Goldstein MG. History and symptoms of depression among smokers during a self-initiated quit attempt. *Nicotine & Tobacco Research*. 1999; 1:251–257. [PubMed: 11072422]
- Nieman RB, Fleming J, Coker RJ, Harris JR, Mitchell DM. The effect of cigarette smoking on the development of AIDS in HIV-1-seropositive individuals. *AIDS*. 1993; 7:705–710.10.1097/00002030-199305000-00015 [PubMed: 8318178]
- Pilcher HR. Stigmatization fuelling Chinese HIV. *Nature*. 2003; 10.1038/news030616-19
- Poulin C, Hand D, Boudreau B. Validity of a 12-item version of the CES-D used in the National Longitudinal Study of Children and Youth. *Chronic Diseases in Canada*. 2005; 26(2–3):65–72. [PubMed: 16251012]
- Ryan RM, Connell JP. Perceived locus of causality and internalization: Examining reasons for acting in two domains. *Journal of Personality and Social Psychology*. 1989; 57:749–761.10.1037/0022-3514.57.5.749 [PubMed: 2810024]
- Schroeder SA. What to do with a patient who smokes. *Journal of the American Medical Association*. 2005; 294:482–487.10.1001/jama.294.4.482 [PubMed: 16046655]
- Shiffman, S.; Wills, TA., editors. *Coping and substance use*. Orlando: Academic Press; 1985. p. 267-293.
- Smith DR, Leggat PA. An international review of tobacco smoking in the medical profession: 1974–2004. *BMC Public Health*. 2007; 7:115.10.1186/1471-2458-7-115 [PubMed: 17578582]
- Stall RD, Greenwood GL, Acree M, Paul J, Coates TJ. Cigarette smoking among gay and bisexual men. *American Journal of Public Health*. 1999; 89:1875–1878.10.2105/AJPH.89.12.1875 [PubMed: 10589323]
- Stead LF, Bergson G, Lancaster T. Physician advice for smoking cessation. *Cochrane Database of Systematic Reviews*. 2008a; (2)10.1002/14651858.CD000165.pub3
- Stead LF, Bergson G, Lancaster T. Physician advice for smoking cessation (review). *Cochrane Database Systematic Review*. 2008b; 16(2):CD00165.10.1002/14651858.CD000165.pub3
- Tang H, Greenwood GL, Cowling DW, Lloyd JC, Roeseler AG, Bal DG. Cigarette smoking among lesbians, gays, and bisexuals: How serious a problem? (United States). *Cancer Causes Control*. 2004; 15:797–803.10.1023/B:CACO.0000043430.32410.69 [PubMed: 15456993]
- The Tobacco Use and Dependence Clinical Guideline Panel, S., Consortium Representatives. A clinical practice guideline on treating tobacco use and dependence: A US Public Health Service report. *Journal of the American Medical Association*. 2000; 283:3244–3254.10.1001/jama.283.24.3244 [PubMed: 10866874]
- Williams GC, McGregor HA, Sharp D, Levesque C, Kouides RW, Ryan RM, Deci EL. Testing a self-determination theory intervention for motivating tobacco cessation: Supporting autonomy and competence in a clinical trial. *Health Psychology*. 2006; 25(1):91–101.10.1037/0278-6133.25.1.91 [PubMed: 16448302]
- Williams GC, Minicucci DS, Kouides RW, Levesque CS, Chirkov VI, Ryan RM, Deci EL. Self-determination, smoking, diet and health. *Health Education Research*. 2002; 17:512–521.10.1093/her/17.5.512 [PubMed: 12408196]

- Wong FY, Huang ZJ, He N, Smith BD, Ding Y, Fu C, Young D. HIV risks among gay- and non-gay-identified migrant money boys in Shanghai, China. *AIDS Care*. 2008; 20:170–180.10.1080/09540120701534707 [PubMed: 18293125]
- Yang, GH. Prevalence of smoking in China. In: Hu, TW., editor. *Tobacco control policy analysis in China: Economics and health*. Singapore: World Scientific; 2008. p. 13-31.
- Zou GA. Modified Poisson regression approach to prospective studies with binary data. *American Journal of Epidemiology*. 2004; 159:702–706. [PubMed: 15033648]

Table 1

Participant characteristics and bivariate analyses examining correlates of HIV status, receiving any healthcare provider cessation intervention, and making a quit attempt in the past among HIV-positive and HIV-negative MSM smokers in Chengdu, China.

Variable	HIV status			Any healthcare provider interaction			Past year quit attempt			
	Total N = 344	Negative N = 156 (45.3%)	Positive N = 188 (54.7%)	No N = 129 (40.6%)	Yes N = 189 (59.4%)	p	No N = 239 (69.5%)	Yes N = 105 (30.5%)	p	
<i>Sociodemographics</i>										
Age (SD)	30.86 (8.41)	31.38 (9.85)	30.27 (6.95)	.22	29.82 (8.30)	30.34 (7.18)	.54	30.13 (8.08)	32.53 (8.93)	.01
Education (%)				<.001			.009			.04
<HS	22 (6.5)	18 (11.5)	4 (2.2)		13 (9.2)	11 (5.4)		19 (7.3)	10 (8.8)	
HS or equivalent	101 (29.6)	56 (35.9)	45 (24.3)		52 (36.9)	50 (242.5)		71 (27.2)	45 (39.5)	
>HS	218 (63.9)	82 (52.6)	136 (73.5)		76 (53.9)	143 (70.1)		171 (65.5)	59 (5.8)	
Income (%)				.004			.002			.004
<Y1000	18 (5.2)	10 (6.4)	8 (4.3)		7 (4.9)	10 (14.9)		13 (4.9)	6 (5.2)	
Y1000 to Y2999	120 (34.9)	67 (42.9)	53 (28.2)		61 (42.7)	61 (29.6)		92 (34.8)	44 (38.3)	
Y3000 to Y4999	136 (39.5)	58 (37.2)	78 (41.5)		58 (40.6)	76 (36.9)		111 (42.0)	35 (30.4)	
Y5000	70 (20.3)	21 (13.5)	49 (26.1)		17 (11.9)	59 (28.6)		48 (18.2)	30 (26.1)	
Marital status (%)				.32			.63			.02
Never married	255 (76.3)	115 (74.2)	140 (78.2)		111 (79.3)	151 (75.9)		205 (79.5)	74 (67.3)	
Married/living with partner	44 (13.2)	25 (16.1)	19 (10.6)		16 (11.4)	30 (15.1)		29 (11.2)	24 (21.8)	
Divorced	35 (10.5)	15 (9.7)	20 (11.2)		13 (9.3)	11 (5.4)		24 (9.3)	12 (10.9)	
<i>Smoking characteristics</i>										
Days smoked, past 30 (SD)	21.88 (10.35)	21.58 (10.41)	21.31 (10.44)	.81	19.84 (11.16)	22.30 (9.83)	.03	21.95 (10.48)	20.71 (10.02)	.28
Average cpd (SD)	11.97 (9.73)	12.52 (10.36)	10.85 (8.82)	.11	10.11 (8.92)	12.33 (9.78)	.03	11.74 (9.91)	12.51 (9.80)	.48
<i>Other related factors</i>										
Days alcohol use (SD)	4.00 (6.50)	4.64 (7.83)	3.20 (4.44)	.03	4.99 (8.52)	3.43 (4.82)	.03	4.19 (6.98)	3.56 (5.22)	.38
Live with another smoker (%)				.01			.005			.004
No	148 (43.0)	56 (35.9)	92 (48.9)		49 (34.3)	100 (48.5)		100 (37.9)	61 (53.0)	
Yes	196 (57.0)	100 (64.1)	96 (51.1)		94 (65.7)	106 (51.5)		164 (62.1)	54 (47.0)	
No. of five friends that smoke (SD)	3.08 (1.47)	3.41 (1.38)	2.72 (1.45)	<.001	3.09 (1.48)	3.01 (1.49)	.62	3.05 (1.46)	3.15 (1.57)	.57
CESD-12 score (SD)	12.89 (8.53)	12.81 (9.39)	13.28 (7.69)	.62	12.12 (8.87)	14.25 (7.89)	.02	12.16 (8.39)	14.57 (8.65)	.01

Variable	HIV status			Any healthcare provider interaction			Past year quit attempt		
	Total N = 344	Negative N = 156 (45.3%)	Positive N = 188 (54.7%)	No N = 129 (40.6%)	Yes N = 189 (59.4%)	p	No N = 239 (69.5%)	Yes N = 105 (30.5%)	p
TSRQ scores (SD)									
Controlled motivation	21.11 (7.78)	20.64 (8.47)	21.66 (7.27)	.24	20.37 (8.24)	21.75 (7.48)	20.42 (7.68)	22.73 (7.81)	.01
Autonomous motivation	26.81 (8.10)	27.80 (8.74)	26.46 (7.75)	.14	26.56 (8.32)	26.90 (8.06)	25.82 (7.90)	29.13 (8.12)	<.001
Amotivation	11.09 (3.91)	10.95 (4.32)	11.09 (3.50)	.73	11.02 (3.99)	11.27 (3.81)	11.16 (3.86)	12.51 (10.02)	.64
Outcomes									
HIV status (%)									
Negative									.17
Positive									
Healthcare provider intervention (%)									<.001
No	129 (40.6)	79 (57.2)	50 (27.8)		79 (61.2)	59 (31.2)	113 (47.3)	43 (41.0)	
Yes	189 (59.4)	59 (42.8)	130 (72.2)		50 (38.8)	130 (68.8)	126 (52.7)	62 (59.0)	
Ever tried to quit smoking (%)									
No	172 (50.0)	89 (57.1)	83 (44.1)	.01	92 (64.3)	84 (40.8)			
Yes	172 (50.0)	67 (42.9)	43 (55.9)		51 (35.7)	122 (59.2)			
Past year quit attempts (%)									
No	239 (69.5)	113 (72.4)	126 (67.0)	.17	115 (80.4)	127 (61.7)			
Yes	105 (30.5)	43 (27.6)	62 (33.0)		28 (19.6)	79 (38.3)			
Quit attempt since HIV diagnosis (%)									
No									.001
Yes									
No					31 (43.7)	31 (21.8)			
Yes					40 (56.3)	111 (70.2)			

Table 2

Multivariate model identifying correlates of any healthcare provider intervention with HIV status as the primary correlate of interest (controlling for sociodemographics, smoking level, and psychosocial factors).

Variable	PR	95% CI	<i>p</i> Value
HIV status			
Negative	Ref	–	–
Positive	3.18	1.87, 5.41	<.001
Age	1.00	0.97, 1.04	.76
Education			
<HS	Ref	–	–
HS or equivalent	0.75	0.23, 2.39	.62
>HS	1.91	0.62, 5.92	.26
Cigarette consumption	1.01	1.00, 1.02	.02
Days alcohol use ^a	0.73	0.55, 0.97	.03
CESD-12 score	1.05	1.02, 1.09	.003

Notes: PR, prevalence ratio.

Nagelkerke $R^2 = .214$.

^aZ-score transformed values.

Table 3

Multivariate model identifying correlates of attempting to quit in the past year with healthcare provider intervention and HIV status as the primary correlates of interest (controlling for sociodemographics, smoking level, and psychosocial factors).

Variable	PR	95% CI	p Value
HIV status			
Negative	Ref	–	–
Positive	0.86	0.48, 1.55	.62
Any healthcare provider intervention			
No	Ref	–	–
Yes	2.62	1.39, 4.94	.003
Age	1.05	1.01, 1.09	.01
Education			
<HS	Ref	–	–
HS or equivalent	1.30	0.40, 4.27	.66
>HS	0.57	0.18, 1.81	.34
Cigarette consumption	1.00	1.00, 1.00	.94
TSRQ autonomous motivation	1.05	1.01, 1.08	.007

Note: Nagelkerke $R^2 = .174$.