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## Intention to quit smoking among human immunodeficiency virus infected adults in Johannesburg, South Africa

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### SUMMARY

Although smoking is common in human immunodeficiency virus (HIV) infected individuals, in resource constrained, high HIV prevalence settings, information on smoking cessation intent and acceptability is limited. Of 150 self-reported current smokers surveyed in two South African HIV clinics, 62 (42%) reported intent to quit smoking in the next year, while 86 (58%) were not interested in quitting or had no plan to quit; 132 (82%) had attempted to quit at least once in the past. Respondents' preferred cessation strategies were counseling and nicotine replacement. A high proportion of HIVinfected smokers want to quit, and interventions should be provided as part of HIV care.

### Abstract

Le tabagisme est courant chez les individus infectés par le virus de l'immunodéficience humaine (VIH). Toutefois, dans les pays à ressources limitées et à prévalence élevée du VIH, les informations sont limitées au sujet des intentions et l'acceptabilité d'arrêt du tabagisme. On a fait une enquête auprès de 150 fumeurs actuels autosignalés dans deux polycliniques VIH d'Afrique du Sud. L'intention d'arrêter le tabagisme au cours de l'année suivante a été signalée par 62 sujets (42%), alors que 86 (58%) n'avaient pas l'intention d'arrêter ou n'avaient aucun plan d'arrêt; 132 (82%) avaient fait au moins une tentative d'arrêt dans le passé. Les stratégies d'arrêt préférées par les répondants ont été l'accompagnement et le remplacement nicotinique. Une proportion élevée de fumeurs infectés par le VIH souhaitent arrêter, et des interventions d'aide à l'arrêt devraient faire partie des soins du VIH.

### Abstract

El tabaquismo es frecuente en las personas infectadas por el virus de la inmunodeficiencia humana (VIH). Sin embargo, es escasa la información que existe sobre el propósito de abandono del tabaquismo y su aceptabilidad en entornos con escasos recursos y alta prevalencia de infección por el VIH. De 150 fumadores actuales autodeclarados entrevistados en dos consultorios de atención del VIH en Sudáfrica, 62 (42%) afirmaron que intentarían abandonar el tabaquismo en el próximo año y 86 (58%) no estaban interesadas ni planeaban hacerlo; 132 (82%) habían intentado

abandonar el hábito por lo menos una vez en el pasado. Las estrategias de abandono preferidas por los entrevistados habían sido el asesoramiento y el reemplazo nicotínico. Una alta proporción de fumadores infectados por el VIH desean abandonar el tabaquismo; por lo tanto las intervenciones encaminadas al abandono del hábito de fumar deberían formar parte de los servicios prestados en la atención de la infección por el VIH.

## Keywords

smoking cessation; HIV; tuberculosis; South Africa

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THE EPIDEMICS of tobacco use, tuberculosis (TB) and the human immunodeficiency virus (HIV) are responsible for enormous morbidity and mortality worldwide.<sup>1</sup> In HIV-infected individuals, smoking is associated with increased risk of bacterial pneumonia, cryptococcosis, chronic obstructive pulmonary disease and mortality.<sup>2,3</sup> TB causes 23% of HIV-related deaths,<sup>4</sup> and there is an increased risk of TB disease risk and mortality among smokers.<sup>1</sup>

Smoking cessation in HIV-infected adults is likely to reduce morbidity and mortality. However, despite a growing burden of tobacco-related illness in low- and middle-income countries,<sup>5</sup> where HIV prevalence is far higher, most research on smoking cessation in HIV-infected populations is from industrialized countries.

A greater understanding of smoking behaviors in HIV settings in resource-limited countries is needed to develop appropriate, cost-effective smoking cessation interventions. We assessed intent to quit smoking and intervention preference in a cohort of HIV-infected smokers.

## METHODS

A cross-sectional survey was conducted among self-reported current smokers aged 18 years. Eligible patients, defined based on **World Health Organization** guidelines as smoking 1 cigarette in the previous week, were recruited twice weekly (on average) from an out-patient HIV program of over 2700 adults based at a tertiary hospital serving a low-income population in Soweto, South Africa. One recruitment session was held at an affiliated clinic.

A structured questionnaire was administered verbally at the clinics. Respondents classified intent to quit as: 1) seriously considering stopping in <30 days; 2) seriously considering stopping in <12 months; 3) wants to stop but has no plan; or 4) does not want to quit. Intent to quit was defined as high (response 1 or 2) or low (3 or 4). Clinical data were abstracted from medical records.

The project was approved by the ethics committees at the University of the Witwatersrand and Johns Hopkins University. Written informed consent was obtained from all respondents. Data were analyzed using Stata 9.0 (StataCorp LP, College Station, TX, USA). Means were

compared using Student's *t*-test, and frequencies compared using  $\chi^2$  or Fisher's exact tests. Logistic regression was used to determine predictors of readiness to quit.

## RESULTS

Between July 2008 and February 2009, 150 adult current smokers were interviewed; 34% were female. The median CD4 count was 350 cells/ $\mu$ l (interquartile range [IQR] 254–528), and 34 (24%) respondents were receiving antiretroviral therapy (ART; Table 1). Respondents reported smoking a median of 5.5 cigarettes/day (IQR 4–10); men smoked more than women (7.5 vs. 4.9 cigarettes/day,  $P < 0.001$ ). Nearly half of respondents reported planning to quit within one month (25%) or one year (17%) of the interview, 55% wanted to quit but had no plan to stop, three (2%) did not want to quit, and two (1%) did not reply. No significant demographic differences were found in low- versus high-intent respondents (Table 1). The most frequently identified barriers to quitting were anxiety/stress (65%), cravings (56%), and social pressure to smoke (29%).

The majority (82%) of respondents reported at least one past quit attempt; most used 'eating sweets' (59%) or 'nothing/willpower' (26%) to aid their attempt. Half (53%) had attempted to quit smoking over the past year, stopping for a median of 17 days (IQR 3–91 days). After adjusting for potential confounders, a recent quit attempt and younger age at smoking initiation were significantly associated with high quit intent (adjusted odds ratio [a R] 3.38,  $P = 0.001$ , and a R = 0.90,  $P = 0.015$ , respectively).

Respondents selected acceptable options and ranked their first choice from a list of cessation aids (Table 2). Using nicotine replacement therapy (NRT) provided free of charge was the most popular, ranked as first choice by 36%; if told they must pay, only 28% remained interested. Support groups were acceptable to 91% and individual counseling from a doctor or nurse to 83%. Clinician-led counseling and free pharmaceutical interventions were most commonly ranked first. Support groups (both HIV-specific and general) were the first choice for 17% of respondents.

## DISCUSSION

In this study of HIV-infected current smokers, the first of its kind in South Africa, the majority of respondents indicated wanting to quit, 42% reported intent to stop within a year, and 55% reported a desire to stop but no quit plan.

Intent to quit is a necessary but not a sufficient step for smoking cessation, and may not be a good marker of success; this study demonstrates that HIV-infected smokers in these clinics want to quit but require assistance. In this sample, people who started smoking at younger ages had a higher intent to quit. This may result from greater lifetime economic cost or negative health effects in those who began smoking early.

Respondents expressed interest in cessation supports in future quit attempts, specifically preferring free NRT (36%), clinician-led counseling (17%), and support groups (17%). Studies in the United States have demonstrated success in reducing smoking and sustaining abstinence in HIV-infected adults using a single clinician-led counseling session and

provision of NRT.<sup>6</sup> Reported barriers to quitting can be addressed with brief counseling interventions.<sup>7</sup>

HIV-infected individuals are at high risk for TB, and TB incidence and mortality is increased by 40% in smokers compared to non-smokers in this clinic population.<sup>8</sup> Smoking, the third largest contributor to mortality in South Africa,<sup>9</sup> is 30% more prevalent among men attending HIV clinics in Johannesburg than in the general population, consistent with other countries.<sup>8,10</sup> The risks for TB, other infections, and the long-term consequences of smoking make HIV-infected smokers a group that would especially benefit from quitting, particularly those who will survive for many years while receiving ART.

While the study population of 150 was a small convenience sample from a clinic population, which may limit the generalizability of the conclusions, these data represent a preliminary investigation into an under-addressed public health problem in South Africa and should be used to generate further hypotheses and interventions.

HIV clinical settings represent a missed opportunity for smoking cessation intervention; 32% of respondents in this study denied that a health professional had ever encouraged them to stop smoking (Table 1). Counseling interventions developed for resource-poor TB care settings could be adapted for use in HIV clinics.<sup>7</sup> Most HIV-infected smokers in this study were aware of the health risks of smoking and wanted to stop; as in other settings, cessation support is required and should be introduced to reduce morbidity and mortality. This study identified several acceptable interventions, which should be evaluated further in this population.

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## References

1. World Health Organization, International Union Against Tuberculosis and Lung Disease. A WH/The Union monograph on TB and tobacco control: joining efforts to control two related global epidemics. WH/HTM/TB/2007.390. Geneva, Switzerland: WH, 2007.
2. Crothers K, Griffith TA, McGinnis KA, et al. The impact of cigarette smoking on mortality, quality of life, and comorbid illness among HIV-positive veterans. *J Gen Intern Med* 2005; 20: 1142–1145. [PubMed: 16423106]
3. Hajjeh RA, Conn LA, Stephens DS, et al. Cryptococcosis: population-based multistate active surveillance and risk factors in human immunodeficiency virus-infected persons: cryptococcal active surveillance group. *J Infect Dis* 1999; 179: 449–454. [PubMed: 9878030]
4. World Health Organization. WH report 2009. Global tuberculosis control: epidemiology, strategy, financing. WH/HTM/TB/2009.411. Geneva, Switzerland: WH, 2009.
5. Ezzati M, Lopez AD. Estimates of global mortality attributable to smoking in 2000. *Lancet* 2003; 362: 847–852. [PubMed: 13678970]
6. Ingersoll KS, Cropsey KL, Heckman CJ. A test of motivational plus nicotine replacement interventions for HIV positive smokers. *AIDS Behav* 2007; 13: 545–554. [PubMed: 18066659]

7. Slama K, Chiang CY, Enarson DA. Helping patients to stop smoking. *Int J Tuberc Lung Dis* 2007; 11: 733–738. [PubMed: 17609047]
8. Martinson NA, Golub JE, Chaisson R, et al. TB risk and smoking in HIV-infected adults: a prospective cohort. Boston, MA, USA: 15th Conference on Retroviruses and Opportunistic Infections 2008, Paper #998 <http://www.retroconference.org/2008/PDFs/998.pdf> Accessed October 2010.
9. Groenewald P, Vos T, Norman R, et al. Estimating the burden of disease attributable to smoking in South Africa in 2000. *S Afr Med J* 2007; 97: 674–681. [PubMed: 17952224]
10. Vidrine DJ, Arduino RC, Lazev AB, Gritz ER. A randomized trial of a proactive cellular telephone intervention for smokers living with HIV/AIDS. *AIDS* 2006; 20: 253–260. [PubMed: 16511419]

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Table 1

Patient demographics, smoking behavior, and attitude profile

Respondent demographics	Total n (%) <sup>*</sup>	Intent to quit smoking		P value
		Low n (%)	High n (%)	
Total	150	86 (57)	62 (41)	
Male	99 (66)	58 (67)	40 (65)	0.71 <sup>‡</sup>
Female	51 (34)	28 (33)	22 (35)	
Race				
Black	146 (97)	85 (99)	59 (95)	
Other	4 (3)	1 (1)	3 (5)	0.31 <sup>‡</sup> (exact)
Age, median [IQR]	37.0 [31.7–42.6]	37.9 [33.8–44.0]	35.7 [30.2–40.4]	0.16 <sup>‡</sup>
Taking ART	34 (24)	18 (23)	16 (27)	0.6 <sup>‡</sup>
Most recent CD4, cells/ $\mu$ l (n = 131), median [IQR]	350 [254–528]	350 [247–532]	350 [248–528]	0.93 <sup>‡</sup>
TB history	37 (25)	20 (24)	17 (27)	0.7 <sup>‡</sup>
Socio-economic status				
Hot water available in home	49 (33)	24 (28)	25 (41)	0.10 <sup>‡</sup>
Owens cell phone	126 (85)	69 (80)	55 (90)	0.10 <sup>‡</sup>
Years education completed, median [IQR]	11.0 [9.0–12.0]	11.0 [8.5–11]	11.0 [9.8–12]	0.74 <sup>‡</sup>
Monthly income in ZAR, median [IQR] <sup>§</sup>	940 [0–1688]	940 [0–1350]	920 [3–2035]	0.20 <sup>‡</sup>
Smoking history				
Age first started smoking, median [IQR]	17 [15–21]	18 [16–21]	16.5 [15–19.25]	0.06 <sup>‡</sup>
Cigarettes per day, median [IQR]	5.5 [4–10]	6 [4–8.25]	5 [4–10]	0.91 <sup>‡</sup>
Time to first daily cigarette, min				
<5	35 (23)	22 (26)	12 (19)	
6–30	13 (9)	7 (8)	6 (10)	
31–60	35 (23)	18 (21)	16 (25)	
>60	67 (45)	39 (45)	28 (45)	0.72 <sup>‡</sup> (exact)

Respondent demographics	Intent to quit smoking			P value
	Total n (%) <sup>*</sup>	Low n (%)	High n (%)	
Weekly expenditure on cigarettes, ZAR, median [IQR]	42 [23.5–70]	42 [25–70]	42 [21–75]	0.75 <sup>‡</sup>
Perceives current health risk	109 (74)	61 (72)	48 (77)	0.44 <sup>‡</sup>
Perceives future health risk	132 (88)	79 (93)	53 (85)	0.14 <sup>‡</sup>
Doctor/nurse advised to quit	102 (68)	59 (68)	42 (68)	0.91 <sup>‡</sup>

\* Unless otherwise indicated.

<sup>‡</sup>  $\chi^2$  test or Fisher's exact test of equality of proportions.

<sup>‡</sup> Student's *t*-test for equality of means. Two non-responses for readiness to quit.

<sup>§</sup> IZAR = US\$0.13.

IQR = interquartile range; ART = antiretroviral therapy; TB = tuberculosis; ZAR=South African rand.

**Table 2**

Frequency of smoking cessation intervention options considered acceptable and ranked first amongst respondent choices

Smoking cessation intervention	Would consider using intervention <i>n</i> (%)	Ranked as first choice <i>n</i> (%)
NRT, free	137(91)	53 (36)
Talking with a doctor or nurse	124(83)	25(17)
Support group for smoking cessation	127(85)	14(10)
Prescription drug, free	136(91)	13(9)
Support group for smoking cessation restricted to HIV-infected participants	131 (87)	11 (7)
NRT, pay	40 (28)	7(5)
Talking with a counselor	112(75)	6(4)
Text message-based support	97 (65)	3(2)
Telephone quit line	92(61)	2(1)
Prescription drug, pay	38 (26)	1 (1)

NRT = nicotine replacement therapy; free = would be provided free of charge; HIV = human immunodeficiency virus; pay = requires purchase by respondent. **All options were explained to respondents.**