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Provider Beliefs and Practices Relating to Tobacco Use in Patients Living with HIV/AIDS: A National Survey

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Abstract

The entire online HIV Medical Association US registry was invited to complete a questionnaire regarding beliefs and practices related to smoking in persons living with HIV/AIDS (PLWHAs). 363/486 returned completed questionnaires. Respondents from 43 states reported caring for 76,570 PLWHAs. Only 22.9% had ever received formal tobacco treatment training. Respondents generally agreed that smoking is an important issue in PLWHAs, but reported low levels of cessation-promoting activities. Providers with larger patient panels, “primarily HIV” practices, and formal cessation training had higher questionnaire scores, indicating stronger beliefs in the harms of smoking, benefits of quitting, and effectiveness of cessation strategies.

Keywords

HIV; Provider; Tobacco; Smoking; Beliefs

Introduction

Over half of the adult persons living with HIV/AIDS (PLWHAs) in the United States smoke cigarettes [1], a rate that is approximately triple the national average [2]. In the general population, provider attitudes and practices can have a significant impact on smoking rates in their patient populations. Even brief advice about quitting can lead to meaningful increases in cessation rates [3]. Primary care providers are also the usual route of access to effective prescription pharmacotherapies. Seventy percent of adult smokers in the US visit their primary providers at least annually [4]. It is likely that PLWHA smokers visit their providers at an even higher frequency given their need for immunologic monitoring and, for most, antiretroviral therapy. These visits represent opportunities either taken or missed to address this important health behavior.

Little is known about the attitudes and behaviors of HIV care providers as they relate to their patients' tobacco use. A recent survey revealed that fewer than half of HIV care providers in New York reported assessing their patients' tobacco use, status, history, dependency, or interest in quitting at every visit [5]. Moreover, providers of care to PLWHAs are less likely to be aware of smoking in their patient populations than providers caring for non-PLWHAs [6]. In order to better understand the provider role in the PLWHA tobacco use epidemic, we conducted a national survey of HIV care providers to determine their beliefs and practices pertaining to tobacco use and cessation in their patient populations.

Methods

In 2008 the investigators developed a questionnaire that addressed various aspects of providers' beliefs and practices related to tobacco use and smoking cessation in PLWHAs. The questionnaire was guided by reports in the published literature of similar studies conducted on providers of care to other patient populations [7–9]. Additional items of particular relevance to the HIV-infected population were developed by consensus. The draft questionnaires were piloted on a group that included HIV care providers, behavioral psychologists, smoking cessation specialists, and public health officials. The feedback of the pilot group was used to revise the questionnaire into its final 36-item form. The 36-items were presented in the form of statements with level of agreement indicated on a five point Likert scale: 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, and 5 = Strongly agree. For analytic purposes a variety of questions were appended to the beginning and end of the questionnaire that collected non-identifying information about providers' backgrounds, work environments, patient populations, and interest level in formal smoking cessation training.

In July 2008, the investigators compiled the entire list of names and addresses of the HIV Medicine Association's (HIVMA) online US provider directory from the organization's website. HIVMA is an organization founded by the Infectious Diseases Society of America "of medical professionals who practice HIV medicine." It has more than 3,600 members from 49 of the United States and from 36 other countries. Anonymous questionnaires were mailed to all US providers in the directory along with a letter explaining the study, a self-addressed stamped envelope, and a five dollar cash honorarium. A second wave of the same questionnaire, without an honorarium, was mailed 2 months later with instructions to complete and return it only if the questionnaire was not completed and returned in response to the first mailing.

Data from returned, completed questionnaires were entered into a secure database. The final, cleaned database was imported into SPSS V14.0 (SPSS, Chicago, IL) for statistical analysis. Most questionnaire items probed for beliefs and practices indicative of the importance of

limiting tobacco use in PLWHAs, e.g. “An HIV-infected smoker who quits is likely to experience important immediate health benefits” and “I prescribe nicotine replacement therapy frequently,” but some statements expressed a lack of belief in the importance of this issue and/or therapeutic nihilism, e.g. “The time that I spend discussing cigarette smoking with my HIV-infected patients could be better spent on other health concerns” and “Discussions about smoking and smoking cessation with HIV-infected patients are usually a waste of time.” In calculating each respondent’s composite score as well as the overall Cronbach’s alpha, the latter items were reverse scored. For each respondent, a mean score was calculated for the 36-item questionnaire as a whole, and for the various subscales that are listed in Table S1 (Online Resource 1). Missing data items were excluded from both the numerator and denominator in these calculations, and the few questionnaires with more than three missing answers ($N = 5$) were excluded from these analyses. The mean overall score and subscale scores were used as the dependent variables in a series of multiple linear regression analyses. In order to compare multivariable representations, we used an “all subsets” approach, and performed an exhaustive search of the model space. The best single predictor models, two-variable models, and so on, were compared using the corresponding R^2 statistic for each model. A final representative model was selected by balancing model information (maximum R^2 value), interpretability, and model complexity (number of predictors added).

The final question on the data collection sheet asked participants, “Would you be interested in attending a brief training session to learn how to conduct smoking cessation counseling with your patients? (Yes, Maybe, No).” Results were dichotomized to Yes/Maybe (i.e. possible or definite interest) and No (i.e. no interest). We performed a logistic regression analysis using this dichotomized response as the outcome variable in order to determine factors having an independent association with interest in participating in a training session. As in the multiple linear regression analyses, all possible models were examined and the final model was selected on the basis of model fit and parsimony.

The introductory letter enclosed with the survey emphasized both the voluntary and anonymous nature of the study. The project was reviewed by the Montefiore Medical Center Institutional Review Board (IRB) and was exempted from IRB oversight.

Results

In July 2008 the HIVMA online provider directory included 486 names and addresses within the US, and questionnaires were mailed to all of them. Completed questionnaires were returned by 363 (74.7%), 326 in response to the first mailing, and an additional 37 in response to the second mailing. Providers from 43 states and the District of Columbia returned completed questionnaires. The cumulative total number of patients cared for by the respondent set was 76,570. Rates of valid responses exceeded 98% for virtually all items with the exception of, “When I discuss smoking with my HIV-infected patients, I use the ‘5 A’s’ as a guide.” Only 95.6% entered valid responses to this item, and several indicated by the use of question marks or text that they were not familiar with the “5 A’s” (Ask about tobacco use, Advise to quit, Assess willingness to make a quit attempt, Assist in quit attempt, Arrange follow-up) [3]. The characteristics of the study respondents are summarized in Table 1.

Almost three fourths of providers were male, and almost half were in the >50 years age stratum. All but three were attending physicians, 54.8% characterized their practice type as primarily adult HIV care and 37.5% characterized it as adult HIV care and infectious diseases. Half of respondents worked in teaching hospital clinics, 30.6% worked in private offices, and the remainder worked in other settings. Most (63.8%) of the respondents had

been providing HIV care for more than 15 years. Only 2.8% reported being current cigarette smokers, and 17.9% had ever smoked cigarettes. The providers reported a wide range of patient panel sizes from 5 to 2000, with a mean of 222.6 ± 232.4 and a median of 150. Less than one fourth (22.9%) reported ever having received formal training or clinical education on tobacco treatment and counseling methods. The majority of respondents (58.4%) indicated either possible or definite interest in attending a brief smoking cessation counseling session.

The overall reliability of the 36-item questionnaire was high, with a Cronbach's alpha of 0.84. The Cronbach's alpha values for the subscales were more variable, with values in the provider role, difficulty, ineffectiveness, counterproductivity, beliefs, and action subscales (as explained in Table S1) of 0.18, 0.39, 0.73, 0.65, 0.74, and 0.74, respectively.

Response distributions to a number of key questionnaire items are presented in Table 2. The data reflect high levels of belief in the importance of smoking in the PLWHA community and the health benefits of quitting, moderate levels of agreement that time pressures are an obstacle to optimal cessation intervention and that provider efforts to promote cessation are unlikely to succeed, and relatively low levels of cessation promoting actions, including extremely low levels of adherence to published guidelines for counseling according to the "5 A's" [3].

Higher mean scores for the questionnaire and its sub-scales were indicative of stronger beliefs in the harms of smoking and the importance of quitting. The results of a multiple linear regression analysis evaluating a variety of factors for independent association with higher mean score on the questionnaire are presented in Table 3 Model A. Provider age, gender, practice setting, years of HIV-care experience, and smoking status (i.e. never, current, or ex-) were not significantly associated with overall mean score. Factors found to be independently associated with higher mean scores were larger PLWHA patient panels, "primarily HIV" practice type, longer time spent counseling PLWHA smokers to quit, and receipt of formal training in smoking cessation.

The action subscale, which assessed smoking cessation promoting activities, i.e. formal cessation counseling, referral to quitlines, use of brochures, and prescription of pharmacotherapy, was analyzed in a separate multivariate model (Table 3 Model B). Provider age, gender, practice setting, years of HIV-care experience, and smoking status (i.e. never, current, or ex-) were not significantly associated with the mean score on this subscale. Factors that were independently associated with higher scores on the sub-scale included larger PLWHA patient panels, formal training in smoking cessation, higher score on the beliefs subscale and lower score on the ineffectiveness subscale.

In the multivariate analysis of factors independently associated with definite or possible interest in attending a training session for smoking cessation counseling, larger patient panels and fewer years in practice were both significant predictors of definite or possible interest. In comparison to those with the smallest PLWHA patient panels (<75 patients), those with 151–300 were more likely to express interest in a training session with an OR_{adj} (adjusted odds ratio) 3.08 (95% CI 1.50–6.10, $P = 0.001$) as were those with the largest patient panels (>300 patients), who had an OR_{adj} 3.39 (95% CI 1.60–7.30, $P = 0.002$; P -value for linear trend across all categories <0.001). Of the various strata of total years providing care to PLWHAs, those in practice for ≤ 10 years (with > 20 years in practice as the reference group) exhibited the highest interest in attending a training session, OR_{adj} 4.56 (95% CI 2.16–9.60, $P < 0.0001$; P -value for linear trend across all categories <0.001).

Discussion

Treatment of tobacco use is universally recommended as a component of the primary care of PLWHAs. The fact that most PLWHAs in the US are current smokers is testimony to the daunting challenge faced by the medical community in controlling this harmful behavior. We conducted a national survey of HIV care providers regarding their beliefs, attitudes, and practices relating to tobacco use in PLWHA patients. The results described reflect a geographically diverse sample from 43 states and the District of Columbia. The rate of survey completion was high (74.7%), and compares favorably with response rates to similar surveys in other provider populations [8]. In the aggregate, the respondent set reported caring for 76,570 PLWHAs.

Primary care providers play a key role in the smoking behaviors of their patients. They can express interest in tobacco use as an important medical topic, they can provide advice to quit, they can refer patients to formal interventions of varying types, they can offer ancillary materials (such as brochures), and they can prescribe effective pharmacotherapies. Whereas the literature suggests “the more the better” with these various approaches, even minimalistic interventions may be effective [3]. We found that providers who described their practices as “primarily HIV” in contrast to “HIV and infectious diseases” scored higher on the 36-item questionnaire. Although we are not aware of any studies that have evaluated health maintenance and preventive care quality indicators in the infectious diseases subspecialty versus HIV-primary care environments, there are ample data to suggest that subspecialists perform worse than their primary care counterparts in delivering health maintenance and preventive care interventions to their patients [10]. In discussing the results of a large study of Medicare beneficiaries in Washington, Rosenblatt et al. commented that “Specialists tend to focus on the interrelated diagnoses that define their specialties [and] probably only rarely provide substantial amounts of care beyond the boundaries of their specialty [10].” Moreover, the time demands of providing comprehensive medical care to patients with chronic medical conditions may also be an impediment to addressing other medical issues. Over 69% of our respondents agreed with the statement: “Cigarette smoking is just one item on the long list of health concerns that every HIV-infected patient has,” and 35.5% agreed with the statement: “I do not have enough time to adequately address cigarette smoking with my HIV-infected patients.” The view that smoking cessation counseling is too time consuming is also commonly held by general and family practitioners caring for non-PLWHAs [8].

Higher volume of PLWHAs in providers’ patient panels was associated with higher questionnaire scores in both multiple regression models. Numerous studies have examined the “volume-quality” relationship in various realms of medical care, and they have generally found improved outcomes with higher patient volumes [11]. Hellinger recently reported that, in a large sample of PLWHAs in five states, physician PLWHA patient volume was a better predictor of HIV-related outcomes than hospital PLWHA volume, suggesting that it is individual provider volume rather than overall organizational volume that drives clinical outcomes [12]. In the current study we found, similarly, that larger patient volumes were associated with higher overall scores on the questionnaire and with greater reported use of smoking cessation materials and strategies.

The fact that providers who had received formal training in smoking cessation had higher overall scores and reported greater use of smoking cessation promoting materials and strategies is not a surprise. It suggests that formal training results in stronger beliefs and attitudes about the harm of smoking and the benefits of quitting, and that these beliefs translate into cessation-promoting actions. A cross-sectional study of this type cannot, however, prove this assertion. It is also possible that providers with stronger beliefs in the

importance of tobacco use as a medical issue were more motivated to attend training sessions, or that providers who work in care settings that offer such training may have developed attitudes and practices associated with higher questionnaire scores. It is similarly not surprising that those providers with stronger beliefs in the health benefits of quitting and less negative beliefs in the value of cessation efforts, scored higher on the smoking action subscale. This constellation of findings suggests that educational programs for HIV-care providers may be an effective means of increasing cessation-promoting activities, and that such programs should emphasize the effectiveness of cessation interventions and the importance of cigarette smoking as a health issue in PLWHAs. The low level of adherence to published recommendations for counseling according to the “5 A’s” schema [3] further suggests that training programs should review and reinforce the optimal approaches to cessation counseling.

Providers with largest PLWHA patient panels and those who had been providing care to PLWHAs for fewer years were more likely to express interest in attending a smoking cessation training session. The finding of greater interest among those with larger patient panels is consistent with our other observations of higher questionnaire scores in those with larger panels. It is not clear why number of years in practice was predictive of interest level in formal smoking cessation training, although investigators have reported a similar “time in practice—interest in training gradient” for other important primary care topics [13].

Our study has certain limitations deserving of mention. Approximately one fourth of the national online provider registry did not return their questionnaires. While the rate of subject participation in this study compares favorably with that of other mail surveys, there may have been qualitative differences between responders and non-responders that limit the generalizability of our findings. Providers who choose to be members of the HIV Medical Association are a select subset of all HIV-care providers in the US and may not be representative of the entire group. The multiple linear regression models found significant, independent associations between several covariates and the outcome variables of interest. However, the R^2 statistics for the two models were 0.21 and 0.30. The fact that the data that we collected left 70–79% of the variability of the dataset unexplained suggests that there were other important factors influencing provider beliefs and practices about smoking and cessation that were not measured in our survey. Finally, we had no mechanism to objectively assess the honesty of the participants’ answers to the survey questions. Social acceptability bias could have swayed providers to inflate the rating of their beliefs and practices pertaining to the harms of smoking and the benefits of quitting. The lack of direct contact with study staff and absence of identifying data on the questionnaire sheets would tend to minimize such bias.

In summary, we conducted a survey of a national sample of HIV care providers regarding their beliefs and practices relating to tobacco use and smoking cessation in their patient populations. Most providers recognized the importance of tobacco use as a medical issue in PLWHAs and the potential benefits of quitting. Many noted the low likelihood of success of cessation promoting activities and lack of time to address tobacco use with their patients, and these factors may represent important barriers to full engagement in these activities. Commonly available and effective cessation strategies were underutilized. The multivariate analyses suggest that the most favorable beliefs and practices relating to tobacco use and smoking cessation in PLWHA patients are exhibited by providers with larger PLWHA patient panels, primarily HIV-related practices, stronger belief levels in the benefits of quitting, and less negative outlooks on the likelihood of successful cessation promotion. The great majority of providers had never received formal training in smoking cessation, and most, particularly those in practice for ten or fewer years, expressed interest in attending a brief training session. The HIV-care community should actively promote provider training

and should craft its message to emphasize the importance of this medical issue and the availability and proper usage of effective cessation strategies.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Characteristics of study participants

Characteristic	Number (%) ^a
Gender	
Male	269 (74.1)
Female	89 (24.5)
Age category	
< 36	12 (3.3)
36–40	46 (12.7)
41–45	62 (17.1)
46–50	71 (19.6)
> 50	171 (47.1)
Provider category	
Attending physician	360 (99.2)
Nurse practitioner	2 (0.6)
PharmD	1 (0.3)
Type of practice	
Primarily adult HIV	199 (54.8)
Adult HIV and infectious diseases	136 (37.5)
Pediatric HIV ± infectious diseases	8 (2.2)
Other or unspecified ^b	20 (5.5)
Care setting	
Private office	111 (30.6)
Teaching hospital clinic	182 (50.1)
Other clinic setting	61 (16.8)
Public health or correctional facility	5 (1.4)
Other or unspecified ^c	4 (1.1)
Number of years caring for persons with HIV	
< 6	21 (5.8)
6–10	67 (18.5)
11–15	45 (12.4)
16–20	69 (19.0)
> 20	159 (43.8)
Ever received formal training or clinical education on tobacco treatment and counseling methods	
Yes	83 (22.9)
No	266 (73.3)
Don't know/not sure	12 (3.3)
Ever smoked cigarettes ^d	
Yes	65 (17.9)
No	292 (80.4)
Don't know/not sure	2 (0.6)
Current smoker	

Characteristic	Number (%) ^a
Yes	10 (2.8)
No	349 (96.1)
Interested in attending a brief smoking cessation training session	
Yes	106 (29.2)
No	146 (40.2)
Maybe	106 (29.2)

^aResponses do not necessarily total to 363 (100%) because of missing data items

^bIncludes dermatology (1), inpatient care only (2), obstetrics/gynecology (1), internal medicine/family practice (3), travel medicine (1), and unspecified (12)

^cInpatient care (2), unspecified (2)

^dMore than 100 cigarettes in subject's lifetime

Table 2

Frequency distribution of responses to selected questionnaire items

Questionnaire item	Strongly disagree (%)	Somewhat disagree (%)	Neither agree nor disagree (%)	Somewhat agree (%)	Strongly agree (%)
Cigarette smoking is one of the major health issues facing the HIV-infected population of this country.	0.3	5.0	15.9	41.6	37.2
I believe that smoking cessation is important for the health of my HIV-infected patients who smoke.	1.1	0.8	1.1	21.4	75.6
I do not have enough time to adequately address cigarette smoking with my HIV-infected patients.	18.3	28.1	17.8	30.3	5.6
My efforts to get HIV-infected smokers to quit are unlikely to succeed.	15.2	38.5	21.3	22.7	2.2
When I discuss smoking with my HIV-infected patients, I use the "5 A's" as a guide.	42.2	17.3	32.4	5.8	2.3
I frequently give smoking cessation brochures to my HIV-infected patients who smoke.	24.6	27.1	17.9	22.9	7.5
I frequently advise HIV-infected smokers to call a quitline.	19.4	16.3	21.6	21.1	21.6
I prescribe nicotine replacement therapy frequently.	7.3	18.5	28.3	30.3	15.7
I prescribe Zyban (Wellbutrin, bupropion) frequently for smoking cessation purposes.	13.6	25.1	24.0	30.4	7.0
I prescribe Chantix (varenicline) frequently.	18.1	17.5	22.6	28.1	13.6

Table 3

Multiple linear regression models

Covariates	<i>B</i>	<i>S.E.</i>	<i>P</i> value
Model A: outcome variable = mean score on 36-item questionnaire			
# of HIV-infected patients in practice			
< 75 (reference)	–	–	–
75–150	0.080	0.060	0.18
150–300	0.153	0.058	0.009
> 300	0.261	0.064	< 0.0001
Average time spent counseling patients about smoking cessation			
< 3 min (reference)	–	–	–
3–5 min	0.171	0.048	0.0004
> 5 min	0.335	0.060	< 0.0001
History of formal smoking cessation training	0.145	0.050	0.004
Type of practice is primarily HIV care	0.189	0.085	0.03
<i>Note:</i> R^2 of the model = 0.21, <i>B</i> = parameter estimate, <i>S.E.</i> = standard error of <i>B</i>			
Model B: outcome variable = mean score on action subscale			
# of HIV-infected patients in practice			
< 75 (reference)	–	–	–
75–150	0.227	0.110	0.041
151–300	0.561	0.107	< 0.0001
> 300	0.533	0.120	< 0.0001
History of formal smoking cessation training	0.223	0.094	0.018
Mean score on beliefs subscale	0.385	0.078	< 0.0001
Mean score on ineffectiveness subscale	–0.371	0.062	< 0.0001
<i>Note:</i> R^2 of the model = 0.30			