

Short Communication

Intentions to Participate in Genetics Research among African American Smokers

Chanita Hughes Halbert,¹ Oscar H. Gandy, Jr.,² Aliya Collier,¹ and Lee Shaker²

¹Department of Psychiatry, Abramson Cancer Center, Leonard Davis Institute of Economics and ²Annenberg School for Communication, University of Pennsylvania, Philadelphia, Pennsylvania

Abstract

Although prior studies have shown that African American smokers are likely to carry some of the genetic variants associated with smoking risk, additional research with African American smokers is needed to replicate these findings. Limited information is available on interest in participating in research to identify genetic risk factors for smoking among African American smokers; therefore, the goals of the present study were to describe intentions to participate in smoking and genetics research, and to determine factors that are associated with participation intentions. Subjects were 128 African American male and female adult smokers. Sociodemographic characteristics, clinical factors, attitudes about genetic testing, and intentions to participate in genetics research were evaluated during a structured telephone interview. Overall, 58% of

respondents reported that they would be very likely to participate in research to identify genetic risk factors for smoking. Greater beliefs about the benefits of participating in medical research (odds ratio, 3.17; 95% confidence interval, 1.45-6.94; $P = 0.004$) and fewer perceptions of the limitations and risks of genetic testing (odds ratio, 0.90; 95% confidence interval, 0.82-0.98; $P = 0.01$) had significant independent associations with reporting a high likelihood of participating in this type of research. Recruitment messages and protocols that address the benefits of research participation, as well as concerns about the limitations and risks of genetic testing, may enhance African American participation in research on genetics and smoking. (*Cancer Epidemiol Biomarkers Prev* 2006;15(1):150-3)

Introduction

Despite significant tobacco control efforts, many African Americans smoke. Ongoing research is identifying genetic variants in neurotransmitter pathways, such as dopamine, that may increase susceptibility to smoking or influence response to smoking cessation treatments (1). There is evidence that African American smokers are more likely than Caucasians to carry some of the genetic variants associated with smoking risk (2, 3), and that such variants increase the liability of relapse for this group (4). This information might ultimately provide the basis for tailoring pharmacologic treatment to individuals with nicotine dependence (5). Unfortunately, knowledge about the role of genetic factors in smoking among African Americans has been limited because most studies focus on populations of European ancestry (6). This might be because African Americans are reluctant to participate in research involving genetic risk assessment.

African American participation in cancer research (e.g., clinical trials) is limited (7, 8); similar trends exist for participation in research on genetic risk factors even though attitudes about genetic testing may be favorable (9-11). For example, 15% of African American women enrolled in a cancer genetics registry compared with 36% of Caucasian women (12). African Americans were also less likely than

Caucasians to provide consent for their blood samples to be included in a national registry for genetics research (13). Furthermore, 49% of African American women participated in a randomized trial evaluating educational interventions about hereditary breast cancer compared with 68% of Caucasian women (14). According to the theory of reasoned action, intentions to participate in genetics research may be associated with beliefs about research and attitudes about genetic testing (15-17); however, empirical data are not available on factors associated with willingness to participate in research on genetic risk factors for smoking among African Americans.

This study evaluated intentions to participate in research on genetic risk factors for smoking and identified factors associated with these intentions among African American smokers. Based on the theory of reasoned action (15-17), we predicted that positive beliefs about research and more favorable attitudes about genetic testing would be associated with participation intentions. Developing a better understanding of the factors that influence African American interest in participating in genetics research on smoking is needed to develop more effective recruitment messages and strategies for future studies.

Materials and Methods

Study Population. Participants were individuals 18 and older who self-identified as being African American or Black. Individuals were recruited to participate in a study on attitudes about race, genetics, and smoking. The University of Pennsylvania Institutional Review Board approved the study.

Procedures. Participants were recruited into the study through self-referrals from newspaper advertisements from

Received 6/15/05; revised 10/13/05; accepted 11/9/05.

Grant support: P50CA095856-01A10004 from the National Cancer Institute and P5084718 from the National Institute on Drug Abuse and the National Cancer Institute.

The costs of publication of this article were defrayed in part by the payment of page charges. This article must therefore be hereby marked advertisement in accordance with 18 U.S.C. Section 1734 solely to indicate this fact.

Requests for reprints: Chanita Hughes Halbert, University of Pennsylvania, 3535 Market Street, Suite 4100, Philadelphia, PA 19104. Phone: 215-746-7144; Fax: 215-746-7140. E-mail: chanita@mail.med.upenn.edu

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doi:10.1158/1055-9965.EPI-05-0437

January 2004 to April 2005. Individuals interested in participating were directed to call a study line. A total of 241 eligible African Americans self-referred to the study and of these, 193 (80%) were enrolled, 37 (15%) could not be reached to complete enrollment, and 11 (5%) declined enrollment. All data were collected by self-report during a 20-minute structured telephone interview after obtaining verbal consent. Of the 193 enrollees, 65 were excluded because they were not current smokers; thus, the final sample included 128 smokers. Smoking status was obtained by self-report.

Measures

Predictor variables. All predictor variables were evaluated by self-report during the survey; questions used to evaluate clinical factors, secondary exposure to tobacco, and beliefs about research are provided in Table 1.

Sociodemographics. Age, marital status, income, education, and employment status were obtained and re-coded into dichotomous variables based on the distribution of responses.

Clinical factors. Family history of lung cancer was evaluated by one question that asked respondents if any of their first-degree relatives had ever been diagnosed with lung cancer.

Secondary exposure to tobacco. Exposure to tobacco products in the home was evaluated by one item that asked respondents if anyone who currently lives in their house uses cigarettes, cigars, or smokeless tobacco.

Beliefs about medical research. Beliefs about participating in medical research were evaluated by two Likert-style items from previous research on intentions to have genetic testing for inherited breast cancer risk. We re-coded these items into dichotomous variables (e.g., very much versus else) based on the distribution of responses.

Attitudes about genetic testing. We adapted items from previous reports (9, 18) to evaluate perceptions of the benefits, limitations, and risks of genetic testing for smoking susceptibility. Specifically, items evaluated reasons for wanting and not wanting to undergo genetic testing (see Table 3). Based on previous research that identified two factors that measured the pros and cons of genetic testing (9), we specified a two-factor solution in our principal components factor analysis to derive scales measuring attitudes. Two reliable factors that measured perceptions of the benefits (Cronbach's $\alpha = 0.78$) and limitations and risks of genetic testing for smoking susceptibility (Cronbach's $\alpha = 0.79$) were identified. Responses to items were summed; scores for perceptions of benefits could range from 5 to 25, and scores for perceptions of limitations and risks could range from 6 to 30, with higher scores indicating greater agreement.

Outcome Variable

Intentions. We used one Likert-style item to evaluate participation intentions. Specifically, respondents were asked "how likely is it that you would participate in a research study designed to identify genetic risk factors for smoking" (1 = not at all likely, 4 = very likely). Similar items have been used to evaluate genetic testing intentions for lung cancer susceptibility and other diseases among African American men and women (14, 19-21).

Results

Sample Characteristics. Table 1 shows the sociodemographic and clinical characteristics of the sample. The mean (SD) age of respondents was 44.8 (10). Most respondents believed that there are benefits to participating in medical research (60%) and less than half (42%) believed that research

participants are exploited. The mean (SD) levels for attitudes about the benefits and limitations of genetic testing for smoking susceptibility were 21.1 (3.1) and 14.4 (4.4), respectively.

Descriptive Information on Participation Intentions. The majority of respondents reported that they would be willing to participate in research to identify genetic risk factors for smoking. Fifty-eight percent of respondents reported that it was very likely that they would participate and only 2% of respondents reported that it was not at all likely that they would participate. Because more than half of respondents reported that it was very likely that they would participate in genetics research, we re-coded this item into a dichotomous variable (very likely versus else) for subsequent analyses.

Predictors of Participation Intentions. As shown in Table 2, sociodemographic and clinical characteristics were not associated significantly with participation intentions. However, respondents who did not live with someone who used tobacco products were significantly more likely to be willing to participate compared with those who lived with someone who used tobacco products. Respondents who perceived greater benefits to participating in medical research were most likely to be willing to participate. Respondents who were very willing to participate in genetics research for smoking reported greater perceptions of the benefits of genetic testing and fewer concerns about the limitations and risks (see Table 3). Participation intentions were not associated with concerns about exploitation.

Multivariate logistic regression analysis was used to identify factors having independent associations with intentions. Variables (secondary exposure to tobacco, beliefs about medical research, and attitudes about genetic testing) that had a significant bivariate association with intentions ($P < 0.10$) were included in the model. Greater beliefs about the benefits of participating in medical research (odds ratio, 3.17; 95% confidence interval, 1.45-6.94; $P = 0.004$) and fewer perceptions of the limitations and risks of genetic testing (odds ratio, 0.90; 95% confidence interval, 0.82, 0.98; $P = 0.01$) had significant independent associations with being very likely to participate in research to identify genetic risk factors for smoking. Respondents who did not live with someone

Table 1. Sample characteristics (n = 128)

Variable	Level	n (%)
Gender	female	64 (50%)
	male	64 (50)
Marital status	not married	101 (79)
	married	27 (21)
Education level	≥ some college	69 (54)
	≤ high school	59 (46)
Employment status	employed	63 (49)
	not employed	65 (51)
Income level	>\$20,000	71 (55)
	<\$20,000	57 (45)
Family history of lung cancer*	no	109 (85)
	yes	19 (15)
Exposure to tobacco products [†]	yes	68 (53)
	no	60 (47)
Beliefs about medical research (26) [‡]	very much	77 (60)
	else	51 (40)
Beliefs about exploitation in research (26) [§]	very much	54 (42)
	else	74 (58)

*Question asked of respondents: Has anyone in your family had lung cancer? If yes, which first-degree relatives (e.g., mother, father, sister, brother, etc.)?

[†]Question asked of respondents: Does anyone who lives in your house currently use any tobacco products such as cigarettes, cigars, or smokeless tobacco?

[‡]Question asked of respondents: In your opinion, do you think there are benefits to people who participate in medical research?

[§]Question asked of respondents: In your opinion, do you think that participants in medical research are taken advantage of or exploited?

Table 2. Association between participation intentions and sociodemographic characteristics, clinical factors, and perceptions about research

Variable	Level	Very likely to participate in genetic research (%)	χ^2
Gender	male	55	0.51
	female	61	
Marital status	married	56	0.14
	not married	60	
Education level	≥ some college	62	1.25
	≤ high school	52	
Employment status	employed	52	1.50
	not employed	63	
Income level	≥\$20,000	61	0.54
	<\$20,000	55	
Family history of lung cancer	yes	59	0.24
	no	53	
Exposure to tobacco products	yes	50	3.63*
	no	67	
Beliefs about medical research	some benefits	70	12.02 [†]
	no benefits	39	
Beliefs about exploitation in research	some exploitation	52	1.36
	no exploitation	62	

* $P < 0.10$.
[†] $P < 0.001$.

who used tobacco products were twice as likely to be willing to participate compared with those who lived with someone who used tobacco products; however, this effect was not statistically significant (odds ratio, 2.12; 95% confidence interval, 0.98-4.70; $P = 0.06$).

Discussion

This study evaluated intentions to participate in research to identify genetic risk factors for smoking in African American smokers. Overall, most respondents were willing to participate in genetics research; however, only a slight majority reported that they would be very likely to participate in this type of research. Previous research has shown that African Americans report a variety of concerns about genetic testing. For example, African Americans in a random digit dial survey were more likely than Caucasians to believe that genetic screening would be harmful to society (22). Similar results were found in a national survey of attitudes about genetic testing in which African Americans also reported significantly greater concerns about the negative consequences of genetic testing compared

with Caucasians (means = 6.34 versus 4.96; ref. 11). Furthermore, although about 15% African American women recruited from urban health care facilities believed that genetic testing would be used to show that their ethnic group is inferior, this belief was not reported by Caucasian women (23). However, consistent with prior studies (9, 10, 19), attitudes about the benefits of genetic testing for smoking susceptibility were endorsed at a higher rate relative to limitations and risks in this study. Despite this, respondents who reported greater perceptions of limitations and risks were less likely to be willing to participate in research on genetics and smoking. Thus, recruitment protocols and messages that address the potential limitations and risks of genetic testing, and strategies for minimizing these concerns, might enhance African American interest in participating in research on genetic risk factors for smoking. However, it should be noted that concerns about exploitation did not relate to intentions.

We found that respondents who believed that there were greater benefits to participating in medical research were most likely to state a willingness to participate in research on genetics and smoking. Possible benefits of participating in this type of research may include contributing to scientific

Table 3. Association between participation intentions and attitudes about genetic testing

Attitudes about genetic testing*	Participation intentions		Kruskal-Wallis χ^2
	Very likely, mean (SD)	Else, mean (SD)	
Benefits			
The information would improve the quality of health care I receive	21.5 (3.3)	20.6 (2.8)	4.72 [†]
I would be able to increase my ability to stop smoking			
The results would help me to understand why it may be difficult to quit smoking			
To know if I needed extra help to stop smoking			
The results would increase my willingness to seek help to stop smoking			
Limitations and risks			
I would not know how the results would be used	13.5 (4.3)	15.6 (4.3)	6.71 [‡]
I would be labeled and treated differently by physicians			
The results may not be accurate			
I would be labeled and treated differently by family and friends			
I would feel that I had no control over my behavior			
I would no longer believe that I can quit smoking			

*Response options for items: 1, strongly disagree; 2, disagree; 3, neutral; 4, agree; 5, strongly agree.
[†] $P < 0.05$.
[‡] $P < 0.01$.

knowledge about smoking and access to smoking cessation if genetic factors are evaluated as part of cessation programs. Although the majority of respondents in the present study believed that there are benefits to research participation, African Americans may be reluctant to self-refer for participation in genetics protocols (14) and may be unwilling to enroll in these studies when invited (12). However, the context for genetic research on smoking may influence participation decisions. More than 80% of African American smokers consented to genetic testing for lung cancer susceptibility done as part of smoking cessation research (24). Thus, providing tangible benefits in research protocols may increase participation in genetic studies among African Americans. However, future studies are needed to determine if African American participation in research on genetic risk factors for smoking varies based on the study procedures and attitudes about the benefits of participating in different types of protocols involving genetic risk assessment.

In considering the results of this study, several limitations should be noted. First, we evaluated participation intentions and not actual participation. Prior reports have shown that intentions do not translate into similar rates of participation in programs that involve genetic testing (18, 25). The cross-sectional nature of the study is a limitation that prevents us from evaluating causality with respect to intentions and perceptions about medical research and the limitations and risks of genetic testing. In addition, detailed information on smoking behavior (e.g., frequency and intensity) was not obtained and the recruitment methods may limit the generalizability of our findings due to self-selection bias. Although our sample was similar to the sociodemographic make-up of Philadelphia residents in the 2000 Census, prospective studies on participation in research on genetics and smoking in relation to smoking behaviors are needed among larger samples of African Americans. Additional research on racial group differences in participation in genetics research for smoking and attitudes about genetic testing for smoking susceptibility is also needed to increase understanding about racial group variation in participation, and the contribution of attitudes to participation differences. Despite these potential limitations, this report shows that most African American smokers are willing to participate in research to identify genetic risk factors for smoking. However, intentions may vary based on beliefs about research and perceptions of the limitations and risks of genetic testing. Recruitment efforts for genetics research on smoking might need to be sensitive to these factors.

Acknowledgments

We are very grateful to all of the men and women who participated in this study.

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