BRIEF REPORT

Perceived Risks of Heart Disease and Cancer Among Cigarette Smokers

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Context Cigarette smoking causes more preventable deaths from cardiovascular disease and cancer than any other modifiable risk factor, but smokers may discount the increased personal risk they face from continued smoking.

Objective To assess smokers' perceptions of their risks of heart disease and cancer.

Design and Setting Telephone and self-administered survey in 1995 of a probability sample of US households with telephones.

Participants A total of 3031 adults aged 25 to 74 years, including 737 current smokers (24.3%).

Main Outcome Measures Respondents with no history of myocardial infarction (MI) (96.2%) or cancer (92.9%) assessed their risk of these conditions relative to other people of the same age and sex. Among current smokers, perceived risks were analyzed by demographic and clinical factors using logistic regression.

Results Only 29% and 40% of current smokers believed they have a higher-than-average risk of MI or cancer, respectively, and only 39% and 49% of heavy smokers (≥40 cigarettes per day) acknowledged these risks. Even among smokers with hypertension, angina, or a family history of MI, 48%, 49%, and 39%, respectively, perceived their risk of MI as higher than average. In multivariate analyses, older (≥65 years), less educated (< high school graduate), and light smokers (1-19 cigarettes per day) were less likely than younger, more educated, and heavy smokers to perceive an increased personal risk of MI or cancer.

Conclusions Most smokers do not view themselves at increased risk of heart disease or cancer. As part of multifaceted approaches to smoking cessation, physicians and public health professionals should identify and educate smokers who are not aware of smoking-related health risks.

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CIGARETTE SMOKING CAUSES more preventable deaths from cardiovascular disease and cancer than any other modifiable risk factor.[1-3] Smokers who quit reduce their risk of these conditions and prolong their lives substantially,[4] but approximately 48 million US adults continue to smoke.[5] Many smokers may discount the increased personal risk they face from continued smoking,[2] thereby demonstrating an "optimistic bias."[6] Physicians' advice may help smokers assess their personal health risks more realistically, but many smokers have not received such advice.[7,8] Improving smokers' awareness of their personal health risks may be useful to promote smoking cessation,[9-11] so we analyzed smokers' perceptions of their relative risk of experiencing a myocardial infarction (MI) and cancer in a nationally representative survey.[12]

METHODS

Data Collection

Following approval of the study protocol by the Human Studies Committee of Harvard Medical School, Boston, Mass, interviewers from a professional survey firm dialed an equal probability sample of telephone numbers in the United States during 1995 to identify residential households. Within each household, 1 English-speaking respondent was selected to achieve prespecified sampling targets defined by sex and 10-year age intervals from 25 to 74 years. Eligible respondents were offered a stipend to complete a telephone interview and a subsequent written questionnaire, both of which provided data for this study. Interviews were completed by 3487 eligible individuals (response rate, 70%), with no evidence of response bias, using 1990 US Census data for each telephone exchange. The written questionnaire was completed by 3031 respondents (87%), yielding an overall response rate of 61%.

Participants were asked if they smoked cigarettes regularly and the maximum daily number of cigarettes they had ever smoked. Individuals with no history of MI (n = 2917, 96.2% of sample) or cancer (n = 2815, 92.9% of sample) were asked, "Do you think your risk of a heart attack (or cancer) is higher, lower, or about the same as other (men/women) your age?"[13]

Data Analysis

We weighted the data to adjust for probabilities of reaching households within each telephone exchange, sampling subjects within each household, and obtaining completed telephone interviews and questionnaires from designated subjects.[14] We also used the *Current Popu-*

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Table 1. Characteristics of Survey Respondents by Smoking Status*

Characteristics	Current Smokers (n = 737)	Former Smokers (n = 868)	Nonsmokers (n = 1426)	*P* Value†
Age, mean, y	42.6	49.5	44.2	<.001
Male	45.4	50.6	38.1	.001
Race				
White	83.7	83.6	80.1	.15
Black	9.6	9.8	12.8	
Other	6.7	6.6	7.1	
Married	59.0	73.7	69.5	.001
Education				
Not a high school graduate	21.1	14.1	8.5	.001
High school graduate	69.7	63.7	60.9	
College graduate	9.2	22.2	30.6	
Region				
Northeast	18.8	21.1	17.2	.07
Midwest	25.1	24.0	25.9	
South	40.6	36.0	37.3	
West	15.6	18.9	19.6	
"A lot" of control over life	68.5	74.3	72.3	.03
"A lot" of satisfaction with life	50.3	63.8	61.6	.001
Have a regular doctor	69.4	74.9	73.4	.04
Had checkup in past year	62.7	72.8	70.7	.001
Fair/poor physical health	21.9	18.1	13.1	.001
Fair/poor mental health	12.7	9.7	9.0	.001
Angina	6.8	5.3	4.1	.03
Hypertension	9.7	14.1	11.5	.02
Family history of myocardial infarction	35.0	42.2	31.5	.001

*Data are given in percentages except where otherwise noted.
†The 3 groups were compared using analysis of variance for age and Pearson χ^2 test for all other variables.

Table 2. Perceptions of Increased Relative Risk of Myocardial Infarction and Cancer Among Current Smokers*

	Myocardial Infarction, Adjusted OR (95% CI)	Cancer, Adjusted OR (95% CI)
Aged 45-64 y vs 25-44 y	1.2 (0.8-1.8)	0.5 (0.4-0.8)†
Aged ≥65 y vs 25-44 y	0.2 (0.1-0.8)†	0.2 (0.1-0.5)†
Sex, male vs female	0.8 (0.5-1.3)	0.8 (0.5-1.3)
Race, black vs white	0.7 (0.2-2.0)	1.2 (0.5-2.9)
Race, other vs white	1.1 (0.4-3.1)	0.9 (0.4-2.2)
Married vs not married	1.1 (0.7-1.8)	1.1 (0.7-1.7)
Non–high school graduate vs college graduate	0.5 (0.2-1.1)‡	0.5 (0.2-0.9)†
High school graduate vs college graduate	0.7 (0.4-1.2)	0.7 (0.4-1.3)
Midwest vs Northeast	1.2 (0.7-2.2)	1.1 (0.6-1.9)
South vs Northeast	1.2 (0.6-2.4)	1.8 (1.0-3.5)‡
West vs Northeast	1.0 (0.5-1.9)	1.1 (0.6-2.1)
"A lot" of life control vs other	0.7 (0.4-1.1)	0.9 (0.5-1.4)
"A lot" of life satisfaction vs other	0.6 (0.4-1.0)‡	0.7 (0.4-1.1)
Have a regular physician vs do not	1.3 (0.8-2.1)	1.2 (0.7-1.8)
Had a checkup in past year vs did not	1.1 (0.7-1.8)	1.0 (0.7-1.6)
Fair/poor physical health vs other	1.6 (1.0-2.7)‡	1.0 (0.6-1.7)
Fair/poor mental health vs other	1.0 (0.5-2.0)	2.0 (1.1-3.7)†
20-39 Cigarettes/d vs 1-19 cigarettes/d	3.0 (1.5-5.8)†	1.8 (1.0-3.3)†
>40 Cigarettes/d vs 1-19 cigarettes/d	3.7 (1.8-7.7)†	3.1 (1.6-5.8)†

*Data were calculated using multiple logistic regression to calculate adjusted odds ratios (ORs) and 95% confidence intervals (CIs) for weighted survey data.
†$P \leq .05$.
‡$P \leq .10$ and $> .05$.

lation Survey (October 1995) to calculate poststratification weights so our cohort who completed both the telephone interview and written questionnaire approximates the distribution of US adults aged 25-74 years by region, metropolitan area, sex, race, age, education, and marital status.

Characteristics of current smokers, former smokers, and nonsmokers were compared using analysis of variance for age and the Pearson χ^2 test for other variables. These other variables included sex, race, education, marital status, geographic region, having a regular physician, receiving a checkup in the past year, history of MI in a parent or sibling, hypertension, angina, overall physical and mental health, control over life, and satisfaction with life. In a multivariate analysis of current smokers that adjusted for these variables, we used logistic regression to assess the relative odds of perceiving higher-than-average risks of MI and cancer. SUDAAN statistical software (Research Triangle Institute, Research Triangle Park, NC) was used to calculate SEs with the complex sampling design.

RESULTS

Of the 3031 respondents completing the telephone and self-administered surveys, 737 (24.3%, similar to the 25.5% reported in the 1994 National Health Interview Survey[5]) were current smokers and 868 (28.6%) were former smokers. Current smokers were younger and included a higher proportion of women than former smokers and were younger and included a higher proportion of men than nonsmokers (**Table 1**). Current smokers were less likely to be married or have graduated from high school than former smokers or nonsmokers. Current smokers were less likely to have a regular physician or have had a checkup in the past year, despite reporting worse physical and mental health. Current smokers also reported less control over life and less satisfaction with life than former smokers or nonsmokers.

Among current smokers, only 29% and 40% perceived their risk of MI or cancer, respectively, as higher than other per-

sons of the same age and sex—approximately double the proportions of former smokers (15% and 18%, respectively) and nonsmokers (15% and 17%, respectively) with these perceptions. Among heavier smokers (≥40 cigarettes per day), only 39% and 49%, respectively, perceived themselves at increased personal risk of heart disease or cancer. Among smokers who also had hypertension, symptomatic angina, or a family history of MI, fewer than half perceived their risk of MI as higher than average (48%, 49%, and 39%, respectively).

In multivariate analyses (**TABLE 2**), smokers older than 64 years were less likely than younger smokers to perceive their risk of MI as higher than average. Smokers older than 44 years and those who had not graduated from high school were less likely than younger smokers and college graduates, respectively, to perceive an increased personal risk of cancer. Heavier smokers were more likely than lighter smokers to perceive an increased risk of MI and cancer, and smokers who reported fair or poor mental health were more likely to report an increased risk of cancer. Smokers' risk perceptions did not differ significantly by sex, race, marital status, geographic region, access to a regular physician, or receipt of a checkup in the prior year.

COMMENT

Despite past efforts to educate smokers about their health risks, our nationally representative study demonstrates that most smokers—even heavy smokers and those with other cardiac risk factors—do not perceive themselves at increased risk of experiencing an MI or developing cancer. Consistent with prior studies of less-representative cohorts, many smokers continue to deny their own personal risks from smoking.[15-20] Thus, as a foundation for smoking cessation efforts, physicians and health educators should assess smokers' risk perceptions and provide more intensive counseling to those who underestimate their personal health risks,[21,22] particularly older and less-educated smokers. Although physician counseling remains a cost-effective method to promote smoking cessation,[23,24] alternate strategies will be needed to help smokers who have greater difficulty quitting and motivate the one third of smokers who do not have access to a regular physician.

In interpreting our findings, we note 4 other points. First, questions about health risks were asked separately from questions about smoking, so responses represent overall risks of heart disease and cancer rather than risks attributable solely to smoking. Second, we assessed the risk of cancer in general rather than specific types of cancer. Third, although most smokers are at increased risk of heart disease and cancer, some smokers may have a lower relative risk based on their family history, diet, or physical activity. Fourth, future studies should compare the accuracy of smokers' relative and absolute risk perceptions and determine how these perceptions influence their success in quitting smoking.[11,20,25]

In conclusion, most adults who continue to smoke in the United States do not recognize or acknowledge an increased personal risk of heart disease or cancer. Because smoking remains the most important preventable cause of these diseases in the United States, physicians and public health professionals should educate smokers about their personal health risks as part of comprehensive efforts to promote smoking cessation.

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