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SEEING A MEDICAL DOCTOR IS ASSOCIATED WITH SERIOUSLY CONSIDERING QUITTING SMOKING

Anca D. DRAGOMIR¹, Wenxuan YANG², George LUTA³

Abstract

Smoking is a very significant public health problem. Quitting smoking will greatly reduce related morbidity and mortality. The purpose of this study was to examine the association between seeing a medical doctor during the past 12 months and seriously considering quitting smoking within the next 6 months, among US smokers. The self-reported information on 3102 current smokers used for the study was from the May 2010 Longitudinal Cohort from the Tobacco Use Supplement to the Current Population Survey. We used logistic regression models with generalized estimating equations (GEE) to account for the clustering of smokers within households. In unadjusted analysis, seeing a medical doctor in the past year was statistically significantly associated with seriously considering quitting smoking (OR=1.56, 95% CI: 1.33-1.82). The results after adjustment for confounders, and also after further adjustment for additional variables, were similar (OR=1.60, 95% CI: 1.35-1.89). We found that seeing a medical doctor was statistically significantly associated with seriously considering quitting smoking among US smokers. Further research work should consider the potential role of income and marital status as effect modifiers for this association.

Keywords: smoking, quitting, self-reported, medical doctor, logistic regression.

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Introduction

Smoking and the use of other tobacco products, including cigars and smokeless tobacco, causes or worsens numerous diseases and conditions. Some products also expose nearby people to toxic secondhand smoke. Smoking generally has negative health effects, because smoke inhalation inherently poses challenges to various physiologic processes such as respiration. A 2007 report states that each year, about 4.9 million people worldwide die because of smoking (West and Shiffman, 2007).

Smoking is one of the most common forms of recreational drug use. Tobacco smoking is the most popular form, being practiced by over one billion people globally, of whom the majority are in the developing world (WHO, 2014). Less common drugs for smoking include cannabis and opium. Cigarettes are primarily industrially manufactured but also can be hand-rolled from loose tobacco and rolling paper. Other smoking products include pipes, cigars, bidis, hookahs, vaporizers, and bongs.

Quitting smoking is beneficial for people's health, the sooner you quit the more you can reduce the chance of getting cancer and other diseases. The carbon monoxide level in blood drops to normal after 12 hours of quitting. The excess risk of coronary heart disease is half that of someone who still smokes, and the risk of a heart attack drops dramatically. The risk of cancers of the mouth, throat, esophagus, and bladder is cut in half. The risk of cervical cancer falls to that of a nonsmoker. The risk of stroke can fall to that of a nonsmoker after 2 to 5 years, and the risk of dying from lung cancer is about half that of a person who is still smoking (Office of the Surgeon General, 1989; World Health Organization, 2007).

We are not aware of any research studies to date that have analyzed the association between quitting smoking and seeing a medical doctor. We describe the results of two related studies. A cross-sectional study in Turkey indicated that smoking cessation practice by physicians for hospitalized patients in a tertiary hospital was associated with the patient's gender, education and morbidity (Baltaci et al., 2016). A cross-sectional study in Argentina involving a self-administered online survey found that recent medical graduates had better knowledge about cessation and were more likely to agree with a full smoking ban in recreational venues (Salgado, Mejía, Kaplan, and Pérez-Stable, 2017). In our study, we investigated the attitude of quitting smoking among current US smokers aged 18 old and older after seeing a medical doctor in the previous year.

Methodology

Study population

The data used in this study is from the May 2010 Longitudinal Cohort from the Tobacco Use Supplement to the Current Population Survey, conducted by the Census Bureau for the Bureau of Labor Statistics. The participants are 3102 current smokers aged 18 years old and older from the civilian non-institutional population

of the US, who completed the labor force interview from the May 2010 cohort. All the information collected from these participants was self-reported.

Outcome variable

The outcome variable is seriously considering quitting smoking and it is based on the question: “Are you seriously considering quitting smoking within the next 6 months (yes/no)?”

Main predictor variable

The main predictor variable was being seen by a medical doctor during the previous year.

Other variables

The demographic characteristics were collected for each participant and were categorized as follows: age (18-24, 25-44, 45-64, and >64 years old), education (<high school, high school, and college or more), marital status (married, divorce/widowed/separated, and never married), race/ethnicity (white, black, and others), sex, work status (employed, unemployed, and not in the labor force), and income (<\$5000, \$5000-\$50000, \$50000-\$100000, and >\$10000). We also used in the statistical analysis the variable being seen by a dentist during the previous year. All variables were used as categorical in the logistic regression models.

Statistical analysis

A preliminary analysis was performed for the whole sample of 3012 current smokers. Descriptive statistics, including frequencies and proportions, were calculated for all categorical variables. Logistic regression models with generalized estimating equations (GEE) were used to evaluate the associations between seeing a medical doctor and seriously considering quitting smoking, controlling for confounders. GEE (Liang & Zeger, 1986) were used to account for the clustering of binary outcomes of current smokers within the same household. The logistic regression models were used with an exchangeable working correlation structure. There are 2757 households selected in this research, so the number of clusters (households) is 2757, and there are up to five smokers in each cluster (household). Logistic regression models with GEE that included only one variable were used to identify the confounders. Eight models had quitting as the binary outcome, while other eight models had seeing a doctor as the binary outcome. Variables which had significant associations ($p < 0.05$) with both having seen a doctor and seriously considering quitting smoking were considered as confounders. Estimated odds ratios, 95% confidence intervals based on empirical (robust) standard errors, and p-values were reported from related statistical tests. All statistical analyses were completed using SAS 9.4 (SAS Institute Inc. Cary, NC).

Results

Preliminary analysis

The participants were 3102 current smokers aged 18 years old and older from the civilian non-institutional population of the US. All information was collected via a detailed questionnaire. The frequencies and proportions were listed in Table 1 below to present the descriptive statistics for the study variables.

Table 1. Descriptive Statistics for the Study Variables.

Variables		Frequency	Proportion
Intent to quit	Yes	1314	42.4%
	No	1788	57.6%
Have seen a Doctor	Yes	2081	67.1%
	No	1021	32.9%
Sex	Male	1530	49.3%
	Female	1572	50.7%
Education	Less than high school	503	16.2%
	High school	2493	80.4%
	College or more	106	3.4%
Income	Less than \$5000	93	3.0%
	\$5000-\$50000	1836	59.2%
	\$50000-\$100000	891	28.7%
	Large than \$100000	282	9.1%
Age group	18-24	151	4.88%
	25-44	1109	35.8%
	45-64	1508	48.6%
	>64	334	10.8%
Work status	Employed	1890	60.9%
	Unemployed	288	9.3%
	Not in the labor force	924	29.8%
Marital status	Married	1351	43.6%
	Windowed or divorced	1003	32.3%
	Never married	748	24.1%
Race	White	2640	85.5%
	Black	289	9.3%
	Others	159	5.2%
	Missing	14	
Have seen a dentist	Yes	1338	43.2%
	No	1758	56.8%
	Missing	6	

Regarding the outcome variable of seriously considering quitting smoking in the next six month, 42.4% smokers were considering to quit while other 57.6% were not. Most smokers (67.1%) have seen a doctor in the previous twelve months. About 80% of current smokers had high school degrees and 85.5% of the current smokers in this research were white.

Table 2. The Associations with Seriously Considering Quitting Smoking within 6 Months

Variable		Odds ratio	95% CI	P value
Education	Less than high school	1		
	High school	1.46	(1.20, 1.79)	<.001
	College or more	1.20	(0.78, 1.84)	0.403
Age group	18-24	1		
	25-44	1.07	(0.77, 1.53)	0.689
	45-64	0.87	(0.61, 1.23)	0.429
	>64	0.58	(0.39, 0.87)	0.008
Work status	Employed	1		
	Unemployed	1.07	(0.84, 1.38)	0.571
	Not in the labor force	0.84	(0.71, 0.98)	0.030
Have seen a dentist	Yes	1		
	No	0.77	(0.66, 0.89)	<.001
Sex	Male	1		
	Female	1.07	(0.93, 1.23)	0.323
Race	White	1		
	Black	1.19	(0.93, 1.52)	0.168
	others	0.87	(0.63, 1.21)	0.420
Income	Less than \$5000	1		
	\$5000-\$50000	0.99	(0.64, 1.52)	0.967
	\$50000-\$100000	1.07	(0.69, 1.67)	0.752
	Large than \$100000	1.26	(0.78, 2.06)	0.346
Marital status	Married	1		
	Windowed or divorced	0.86	(0.73, 1.02)	0.092
	Never married	1.03	(0.86, 1.23)	0.742

Table 2 shows the associations of the variables with seriously considering quitting smoking within 6 months. Education level, age group, work status and seeing a dentist were associated with seriously considering quitting smoking.

Table 3. The Associations with Seeing a Medical Doctor during the Previous Year

Variable		Odds ratio	95% CI	P value
Education	Less than high school	1		
	High school	1.47	(1.20, 1.78)	<.001
	College or more	2.41	(1.48, 3.92)	<.001
Age group	18-24	1		
	25-44	1.54	(1.09, 2.18)	0.016
	45-64	2.35	(1.66, 3.32)	<.001
	>64	3.88	(2.54, 5.93)	<.001
Work status	Employed	1		
	Unemployed	0.68	(0.52, 0.87)	0.003
	Not in the labor force	1.63	(1.37, 1.95)	<.001
Have seen a dentist	Yes	1		
	No	0.28	(0.23, 0.33)	<.001
Sex	Male	1		
	Female	2.04	(1.76, 2.36)	<.001
Race	White	1		
	Black	1.07	(0.82, 1.40)	0.608
	others	0.81	(0.58, 1.13)	0.219
Income	Less than \$5000	1		
	\$5000-\$50000	0.92	(0.59, 1.45)	0.733
	\$50000-\$100000	1.09	(0.69, 1.73)	0.717
	Large than \$100000	1.27	(0.76, 2.13)	0.357
Marital	Married	1		
	Windowed or divorced	1.01	(0.85, 1.22)	0.878
	Never married	0.55	(0.45, 0.66)	<.001

Table 3 shows the associations of the variables with seeing a medical doctor in the previous year. Education level, age group, work status, sex, marital status and seeing a dentist were associated with seriously considering quitting smoking.

The variables significantly associated ($p < 0.005$) with both seriously consider quitting smoking and having seen a medical doctor, specifically age group, education level, work status, and seeing a dentist, were considered as confounders; they were included to be adjusted for in the primary model.

Table 4. The Association between Seeing a Medical Doctor and Seriously Considering Quitting Smoking

Model	Odds ratio	95% CI	P value
Unadjusted model	1.56	(1.33, 1.82)	<0.001
Adjusted model 1*	1.60	(1.35, 1.89)	<0.001
Adjusted model 2#	1.60	(1.35, 1.89)	<0.001

**Model included adjustment for education level, age group, work status, and seeing a dentist. #Model included adjustment for all variables.*

Three logistic regression models with GEE were considered to evaluate the association between seeing a medical doctor and seriously considering quitting smoking. The first logistic regression model with GEE included having seen a medical doctor as the only variable, to provide results regarding the unadjusted association. The odds of seriously considering quitting smoking for current smokers who have seen a doctor in the previous year were 1.56 times higher than the odds of seriously considering quitting smoking for current smokers who haven't seen a doctor. The 95% confidence interval was (1.33, 1.82), which excluded 1, and $p < 0.001$, both indicating that the results were statistically significant.

The second logistic regression model with GEE involved adjustment for age group, education level, work status and seeing a dentist. The odds of seriously considering quitting smoking for current smokers who have seen a doctor in the previous year were 1.60 times higher than the odds of seriously considering quitting smoking for current smokers who haven't seen a doctor, after controlling for age group, education level, work status and seeing a dentist. The 95% confidence interval was (1.35, 1.89), which excluded 1, and $p < 0.001$, both indicating that the results were statistically significant.

The corresponding results from a the logistic regression model with GEE that included all study variables were unchanged (OR=1.60, 95% CI: 1.35-1.89), with $p < 0.001$, which shows a statistically significant association between seeing a medical doctor and seriously considering quitting smoking, after adjustment for all the other variables.

Discussion and Conclusions

The goal of this exploratory study was to determine whether seeing a medical doctor in the previous year was associated with seriously considering quitting smoking in the next six months among current US smokers. By using logistic regression models with GEE to account for the potential correlation of the intent to quit outcomes for smokers from the same household, our study found that seeing a medical doctor was statistically significantly associated with seriously considering quitting smoking (OR =1.56, 95% CI: 1.33-1.82). Age group, education level, work status and seeing a dentist, which were associated with both seeing a medical doctor and seriously considering quitting, were considered as confounders and were adjusted for using a logistic regression model with GEE. The adjusted results were similar to the unadjusted results and indicated that seeing a medical doctor was significantly associated with seriously considering quitting smoking (OR=1.60, 95% CI: 1.35-1.89). The corresponding results from a logistic regression model with GEE that included adjustment for additional variables were unchanged (OR=1.60, 95% CI: 1.35-1.89).

The interpretation of the findings of the current study should be considered within the context of the study limitations. This study used self-reported, cross-sectional data, which makes it prone to report bias and limits the ability to establish cause-effect relationships. While our analyses controlled for several important predictors of intention to quit including age, race, education level and income, it is possible that there might be residual confounding related to other variables such as anxiety, alcohol use and financial stress. Such confounding would weaken the ability of the study to provide results that may be given a causal interpretation. Since we do not know what were the specific reasons for the participants to see a medical doctor during the previous year, how many visits each participant had, and if the medical doctor has advised the participants to quit smoking during those visits or not, we cannot further clarify the specific mechanism underlying the association under investigation. Future statistical analyses should evaluate the potential role of income and marital status as potential effect modifiers for the association of interest, and also the potential impact on the results of using different categorizations for the age groups and education levels. Further studies should use longitudinal data to evaluate the proportion of successful smoking cessation among the current smokers who are seriously considering quitting smoking in the near future.

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