

A PRELIMINARY AWARENESS STUDY OF TOBACCO ISSUES AMONG COLLEGE STUDENTS

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Abstract: The purpose of this study was to collect preliminary awareness and opinion data from students at a large Midwestern university regarding personal tobacco use, patronage to smoke-free establishments, and support for policies and ordinances prohibiting the use of tobacco on university grounds. Results of logistic regression analyses indicated gender and smoking status to be significant predictors for perceived impact of the smoking ordinance on respondents' patronage to local establishments. Additionally, gender, age, and smoking status were found to be significant predictors for respondents' advocacy for a tobacco-free campus. This descriptive study may be instrumental in the creation of future studies that investigate issues surrounding tobacco use and the implementation of tobacco-free ordinances.

The widespread health ramifications of tobacco use and exposure to environmental tobacco smoke (ETS) has led health professionals and the general public to recognize and address the vast concerns surrounding this established contemporary health issue. In the United States, approximately 46 million adults (22.5%) smoke cigarettes (Center for Disease Control and Prevention [CDC], 2004). As the leading cause of preventable deaths, cigarette smoking claims the lives of about 440,000 people each year (CDC, 2002, 2003). Cigarette smoke contains over 4,000 chemicals, in which approximately 50 are known carcinogens (National Cancer Institute, 1999; National Toxicology Program, 2002). Consumption of cigarettes results in a multitude of negative health conditions including numerous forms of cancer, coronary heart disease, stroke, vascular disease, chronic obstructive lung disease, and adverse reproductive effects (Fielding et al., 1998; Novotny & Giovino, 1998; Ockene & Miller, 1997; U.S. Department of Health and Human Services [USDHHS], 1989, 2001). Tobacco use is responsible for more American deaths annually than motor vehicle injuries, illegal drug use, alcohol use, human immunodeficiency virus (HIV), homicide, and suicide combined (CDC, 2002; McGinnis & Foege, 1993). In the United States, approximately 3,000 lung cancer deaths and 35,000 heart disease result from exposure to environmental tobacco

smoke each year (CDC, 2002).

There are many reasons for college students not to smoke or use other forms of tobacco. Some are more obvious than others. Many times smoking in college corresponds with other unhealthy behaviors such as binge drinking, the use of other drugs, and even depression (Lenz, 2004). However, there are also reasons for entire communities, such as college campuses, to enforce tobacco ordinances that prohibit smoking in public places and places of employment. It has been shown that "policies establishing smoke-free environments are the most effective method for reducing exposure to secondhand smoke" (Task Force on Community Preventive Services, 2001). Restrictions, policies, and ordinances which regulate locations where smoking is permitted are associated with decreased rates of cigarette consumption and may increase cessation rates (USDHHS, 2000).

As of January 2005, six of the fifty states in the U.S. (California, Connecticut, Delaware, Maine, Massachusetts, and New York) had passed ordinances prohibiting smoking within almost all workplaces and dining establishments (including restaurants and bars). Additionally, as of January 2005, approximately 165 municipalities had passed ordinances prohibiting smoking within all workplaces, restaurants, and bars. Of these municipalities, 12 are homes to university and college campuses. Since then, around the United States, other municipalities

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have continued constructing strategies to develop and implement 100% smoke-free ordinances. As the fight to increase the number of municipalities with smoke-free ordinances continues, the positive health effects on society remain to be seen (American Nonsmokers' Rights Foundation, 2005).

In Helena, Montana, reported heart attack cases decreased substantially after eliminating smoking in the workplace (Sargent, Shephard, & Glantz, 2004). Decreases in coronary artery blood flow and constriction of arteries due to impaired endothelial function, a leading cause of atherosclerosis, have also been found (Harvard Men's Health Watch, 2004). In addition to the health benefits of limiting ETS exposure through smoking ordinances, the 2001 College Health Survey found that college students' academic performance was linked to tobacco use (Lentz, 2004). It found that both weekday and weekend exposure to tobacco smoke significantly increased the student's likelihood to have used tobacco in the past month. Other studies have found that exposure to parents or friends who smoked, or a high perception of smoking within their community, increased a student's likelihood to smoke themselves (Chassin et al., 1996; Chassin et al., 1991; DeBernado et al., 1999; Martinelli, 1999). It is reported that adults who have never smoked but lived with smokers have higher mortality rates (15%) than those who lived with non-smokers (Harvard Men's Health Watch, 2004).

Researchers and business owners should attempt to understand the opinions and awareness levels of college students regarding the issues surrounding tobacco use. Since college students are primary targets of bars, nightclubs, and the tobacco industry, especially in college towns, their attitudes and behaviors impact the local economy (Sepe, Ling, & Glantz, 2002). The decisions of college students' regarding tobacco use may also significantly influence the likelihood of creating and implementing campus ordinances that prohibit smoking within university settings.

METHOD

INSTRUMENT

Participants were surveyed using identical paper-based and Internet-based surveys, which consisted of eleven yes/no questions and an additional four demographic questions (Table 1). It took approximately two minutes on the average for a student to complete the survey.

PARTICIPANTS AND PROCEDURES

Data were collected from a convenience sample of 1,265 participants on a large Midwestern university campus using both paper-and-pencil and Internet data collection methods. Participants were recruited

for the paper-based survey in two high-traffic locations on campus outside of class time. Participants for the Internet-based survey were recruited on campus, outside of class time, by being provided with a paper-based web invitation that listed the URL address where the Internet-based survey was hosted. All data were collected over a period of three weeks. One thousand paper-based surveys and 265 Internet-based surveys were collected. Out of 1,265 collected surveys, 13 were dropped from the data set because of more than 50% of missing data. An additional 101 participants were dropped due to their non-student status. No incentives were provided to the participants. Participation in this study was voluntary and participants could withdraw from the study at any time. No identifying information was collected from participants, thus confidentiality was maintained.

RESEARCH QUESTIONS

The study investigated two primary research questions: 1) What would be significant demographic predictors for college students' patronage to local bars and restaurants after the public smoking ban ordinance was passed? 2) What would be significant demographic predictors for college students' attitude toward a tobacco-free campus?

DATA ANALYSIS

Statistical analyses were conducted using Statistical Package for the Social Sciences, windows version 13.0 (SPSS Inc., September 2004). Frequencies and percentages of each response by item were calculated for the participants. The associations between categorical dependent variables and other variables of interest were examined using chi-square significance tests to identify variables to be submitted to logistic regression analyses. In case of two by two tables, the chi-square values with continuity correction were used in significance tests. Bivariate and multivariate logistic regression was conducted for the two categorical dependent variables. Significant associations with one or more variables of interest in the chi-square tests were included to further examine crude and adjusted odds ratio of each level of significant predictors in each regression model were shown.

RESULTS

DEMOGRAPHIC CHARACTERISTICS

Investigators collected data from a sample of 1,151 college students, representing approximately 3% of the student population ($n = 35,261$). Of these respondents, 50% ($n = 574$) classified themselves as male and 50% ($n = 575$) as female. A majority of the respondents (80%) were aged 18 to 23 years, 10% were aged 24 to 26 years, and another 10%

Table 1. Logistic Regression Results for Correlates of Perceived Impact of the Public Place Smoking Ban Ordinance on Patronage to Local Bars and Restaurants

Variable	OR	95% CI	AOR	95% CI
Smoking Status				
Smoker	1.0	reference	1.0	reference
Non-smoker	34.6***	20.7 – 57.9	33.6***	20.1 – 56.4
Gender				
Female	1.78**	1.22 – 2.61	1.42	0.86 – 2.35
Male	1.0	reference	1.0	reference

Note. OR = crude odds ratio. CI = confidence interval. AOR = adjusted odds ratio.

** $p < .01$

*** $p < .001$

were aged 27 years or older. In terms of academic standing, about 16% of the students were freshmen, 20% sophomores, 21% juniors, 25% seniors, 17% graduate students, and 1% from other categories. The composition of the sample in terms of academic standing was very similar to that of the entire student population which consisted of 16% freshmen, 18% sophomores, 18% juniors, 26% seniors, 20% graduate students, and 3% from other categories (University Research and Reporting, 2005).

TOBACCO USE

Thirty-one percent ($n = 359$) of the respondents reported having used a tobacco product in the past 30 days. Among the smokers, 55% ($n = 199$) were male and 50% ($n = 180$) reported having thought about quitting in the past 30 days. Twenty-five students used both cigarettes and smokeless tobacco and five students used only smokeless tobacco. Of the nonsmoking students, 29% were aware of cessation services on campus and 40% of smoking students were aware of the services ($\chi^2 = 13.0, df = 1, p < .001$). Age was also associated with awareness of the campus cessation services ($\chi^2 = 10.4, df = 3, p = .016$). Students aged 21 to 26 (37%) were more aware of the cessation services than those aged 18 to 20 (28%) and those aged 27 or older (27%).

ATTITUDES TOWARD ETS AND TOBACCO-FREE CAMPUS

About 96% ($n = 1103$) of all the respondents, including 93% ($n = 332$) of all the smokers, agreed that exposure to ETS is harmful. When asked about the impact of the newly enacted city ordinance banning smoking in public places upon participants' patronage to local bars and restaurants, 42% ($n = 482$) of the respondents indicated that they would patronize local bars and restaurants more often, 46% ($n = 523$) about the same, and 12% ($n = 142$) less often. As shown in Table 1, gender ($\chi^2 = 9.0, df =$

2, $p = .011$) and smoking status ($\chi^2 = 260, df = 2, p < .001$) were significant predictors for perceived impact of the smoking ordinance on respondents' patronage to local bars and restaurants in bivariate logistic regression analyses.

However, when the correlates were entered in a multivariate logistic regression model, gender was no longer significant. Only the smoking status was a significant predictor for perceived impact of the ordinance on patronage to bars and restaurants (adjusted odds ratio [AOR] = 33.6). When a subgroup analysis was conducted for smokers, no significant difference was found in the perceived impact of the ordinance on patronage to bars and restaurants between those who had thought about quitting smoking and those who had not ($\chi^2 = 2.1, df = 1, p = .151$).

When asked if they thought all university campus grounds should be tobacco free for students, staff and visitors, 54% ($n = 626$) of the respondents indicated that they would support a tobacco free campus and 44% ($n = 508$) indicated disapproval. As shown in Table 2, gender ($\chi^2 = 11.3, df = 1, p = .001$), age ($\chi^2 = 7.8, df = 3, p = .05$) and smoking status ($\chi^2 = 118, df = 1, p < .001$) were significant predictors for advocating a tobacco-free campus in both bivariate and multivariate logistic regression analyses.

Controlling for smoking status, female students (AOR = 1.42) and those aged 21 to 23 (AOR = 1.62) were more likely to advocate for a tobacco-free campus than male and those aged 27 or older, respectively. Among the smokers, no significant difference was found in their attitude toward a tobacco-free campus between those who had thought about quitting smoking and those who had not ($\chi^2 = 1.4, df = 1, p = .234$).

DISCUSSION

Understanding the communities in which we work is paramount when attempting to appropriately assess their assets, strengths, and limitations

Table 2. Logistic Regression Results for Correlates of Attitude Toward Tobacco-free Campus

Variable	OR	95% CI	AOR	95% CI
Smoking Status				
Smoker	1.0	reference	1.0	reference
Non-smoker	4.30***	3.29 – 5.63	4.34***	3.30 – 5.70
Gender				
Female	1.51***	1.19 – 1.91	1.42**	1.10 – 1.83
Male	1.0	reference	1.0	reference
Age				
18 – 20	1.33	0.87 – 2.04	1.15	0.73 – 1.81
21 – 23	1.61*	1.05 – 2.46	1.62*	1.03 – 2.55
24 – 26	1.02	0.60 – 1.75	1.08	0.61 – 1.91
27 or older	1.0	reference	1.0	reference

Note. OR = crude odds ratio. CI = confidence interval. AOR = adjusted odds ratio.

* $p < .05$

** $p < .01$

*** $p < .001$

in regard to serving societal needs and addressing popular demands. When assessing current rates of tobacco use in a population, along with cessation efforts, it is important to understand the complexities of the target audiences of “Big Tobacco” companies and various individual, family, and societal obstacles to successful tobacco cessation. Although this study did not fully identify or discuss the complex factors contributing to individual tobacco use, it did identify the thoughts and opinions held by its participants regarding personal tobacco use, patronage to smoke-free establishments, and support for policies and ordinances prohibiting the use of tobacco on university grounds.

Findings of this study suggest that regardless of gender and tobacco use, college students support the newly implemented smoking ordinance. The vast majority, in each demographic, reported that their patronage to local bars and restaurants will either increase or remain unchanged. These findings indicate that patrons of local establishments view the ordinance as a desirable change and patronage (equating to establishment revenue) will avoid negative ramifications (thus supporting the findings of numerous economic impact studies; Albers et al., 2004; American Heart Association Weekly Pulse, 2005; Bartoch & Pope, 2002; CDC, 1995; Cremieux & Ouellette, 2001; Glantz, 2000; Glantz

& Charlesworth, 1999; Glantz & Smith, 1997; Scollo et al., 2003).

The successful efforts made by local tobacco prevention and cessation coalitions (and other health agencies) to educate, raise awareness, and reduce tobacco use rates have been widely seen within communities through the development and implementation of city and county smoke-free ordinances. Although many of these campaigns have been effective, colleges and universities should complement such efforts by striving to change campus smoking policies. Localized campus efforts may result in increasing support for existing and future university and campus policies and ordinances that prohibit and eventually eradicate smoking in academic settings.

Despite the ideal goal of creating tobacco-free ordinances, the achievement of such an objective is not easily accomplished. Prior to shifting focus on policy change, students must work with local tobacco prevention and cessation coalitions to strengthen rapport and develop realistic strategies. It is recommended that students collaborate with local coalitions to ensure that efforts are strengthened due to the coalition’s experience and expertise. When attempting to create and implement university or campus smoke-free ordinances it is important to incorporate student representatives in all stages of the planning process. Incorporating student efforts with

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a strong, unified coalition yields a loud voice, which demands recognition and respect, thus initiating a proactive approach toward changing existing policy (ultimately resulting in the reduction of tobacco use rates).

Although the findings of this study are significant, it is recommended that the results of this study be interpreted with caution as it was a preliminary study for future research projects attempting to investigate college students' patronage to smoke-free bars and restaurants and their attitude toward a tobacco-free campus. More comprehensive tobacco studies may attempt to determine underlying causes of students' attitudes toward tobacco use and investigate students' opinions and support for potential university smoke-free policies. Additionally, it is recommended that future research projects include a second component that attempts to collect similar data from community members, thus enabling researchers to compare results between students and community members.

This study utilized two recruitment strategies; paper-based recruitment for Internet-based surveys and verbal recruitment for paper-based surveys. Of the 2,000 paper-based Internet invitations distributed on campus, only 265 (13%) participants completed the Internet-based survey. Modified recruitment strategies to simplify access to the Internet-based survey are recommended for future studies. The low response rate for the Internet-based survey may have been attributed to a complex URL address (comprising of a combination of words, numbers, and symbols), which may have discouraged potential participants and/or fostered typing errors. Response rates may be increased by posting Internet links on existing university websites. Electronic Internet links will direct willing participants directly to the

survey, thus reducing errors when entering complex URL addresses.

Another recommended recruitment strategy includes the utilization of mass electronic mail messages. Direct Internet links included in such mail messages will not only reduce potential entering errors, but also allow researchers to more accurately gauge rejection rates. Although implementing such strategies will target large, representative samples, they may not reduce biases based on personal interest of the topic being researched. Once the survey methods and instrument have been modified, it should be piloted prior to mass recruitment efforts.

LIMITATIONS

There are limitations of this study. First, there may have been a selection bias in the sample due to the lack of probability sampling methodology. However, the demographics of the sample were representative of the entire student population in terms of academic standing. Second, multiple questions were not used to measure the same construct, which did not allow evaluation of the internal consistency of the instrument. The investigators chose single questions in order to increase the response rate. To overcome the lack of a tool to measure reliability of the instrument, the question items were designed to be as specific as possible to enhance reliability of the instrument. Third, due to the survey administration procedure of this study that involved passing out questionnaires in a high-traffic location on campus, response rates could not be accurately computed. The investigators selected this method to minimize a selection bias despite the difficulty in computing response rates. Finally, causal relationships should not be inferred from the present findings since this study used a cross-sectional survey design.

Table 1. Instrument Used

	YES	NO	N/A
1. Have you smoked a tobacco product in the last 30 days?	_____	_____	
2. Have you use spit tobacco in the last 30 days?	_____	_____	
3. If you do use tobacco products, have you thought about quitting in the last 30 days?	_____	_____	_____
4. Are you aware of cessation services available on campus?	_____	_____	
5. Are you aware of cessation services available in the community?	_____	_____	
6. Do you think exposure to secondhand smoke is harmful?	_____	_____	
7. Are you aware of campus's 30 ft smoke free entrance-way policy?	_____	_____	
8. Prior to January 1, 2005, were you aware of the City of _____ Smoke Free Public Place Ordinance (inclusive of bars and restaurants)?	_____	_____	
9. Do you think _____ University, including ALL campus grounds, should be tobacco free for students, staff, and visitors?	_____	_____	
10. If No to #10, would you be supportive of designated smoking areas on campus?	_____	_____	_____
11. How will the _____ Smoke Free Public Place Ordinance affect your patronage to local bars and restaurants? I will patronize	More often _____	Less often _____	About Same _____

Demographic Information:

I am a: Female _____ Male _____

I am an _____ University Student: Yes _____ No _____

My current student status is:

Freshman___ Sophomore__ Junior___ Senior___ Graduate___ Other___

My age is: 18-20 _____ 21-23 _____ 24-26 _____ 27 and older _____

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