

Assessment of Undergraduate Student Smoking Behaviors and Attitudes Toward the
Implementation and Enforcement of a Tobacco-Free Campus Policy at Tufts University

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SPECIFIC AIMS

The proposed senior honors thesis will address knowledge, attitudes and behaviors with regard to tobacco among Tufts University undergraduates and has three major aims: (1) to assess smoking behaviors and perceptions of smoking norms on campus, (2) to determine students' overall support of a tobacco-free policy for the Tufts University campus, (3) evaluate students' perceptions of the benefits and barriers associated with the implementation and attitudes about the enforcement of this policy. The findings of this investigation will be used to develop a strategic plan for the gradual implementation and enforcement of a tobacco-free campus policy at Tufts. This will be one of the first evaluations of students' views on the implementation and enforcement of a tobacco-free policy during the initial stages of policy implementation.

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STATEMENT OF SIGNIFICANCE

Smoking: Burden of Disease

Smoking is the world's leading cause of preventable death. Specifically, cigarette smoking is responsible for over 480,000 premature deaths each year in the United States, and roughly 41,000 of these deaths are due to exposure to secondhand smoke (U.S. Department of Health and Human Services, 2014). One in every three cancer deaths can be attributed to smoking, and smoking causes approximately 90% of lung cancer cases (American Cancer Society, 2016). In addition to cancer, smoking can lead to heart disease, diabetes, stroke, and chronic obstructive pulmonary disease (American Cancer Society, 2016). According to the Centers for Disease Control and Prevention, adult smoking rates have fallen from around 43% in 1965 to about 15% in 2015 (Jamal, 2016). While this progress is encouraging, cigarette smoking in this country is a pressing public health issue that must be addressed. Roughly 40 million Americans are still dependent on tobacco, and the Surgeon General's report predicts that 5.6 million children alive today will die prematurely as a result of smoking (U.S. Department of Health and Human Services, 2014).

Smoking: Populations at Risk

Using data from the National Health Interview Survey (NHIS), the Centers for Disease Control and Prevention assessed the most recent prevalence of cigarette smokes among adults 18 years or older (Jamal, 2016). The NHIS uses the National Cancer Institute (NCI) definition for smoking status, which defines "current smoker" as anyone who reported smoking ≥ 100 cigarettes in his or her lifetime and reported currently smoking cigarettes every day or some days ("NCI Thesaurus," 2016). According to the CDC, 15.1% of U.S. adults were current cigarette

smokers in 2015. Slightly more males (16.7%) than females (13.6%) reported current cigarette use, and prevalence was highest in adults ages 25-44 (17.7%), and lowest in adults ≥ 65 years (8.4%). Prevalence was highest among American Indians/Alaska Natives (21.9%). Smoking prevalence was negatively associated with income level, with significantly more cigarette smokers below the poverty level (26.1%) than above the poverty level (13.9%). Prevalence varied by U.S. region, with the highest prevalence in the Midwest (18.7%) and the lowest in the West (12.4%). Lesbian, gay, bisexual, transgender, and queer (LGBTQ) individuals (20.6%) were likely to be current smokers; this could be, in part, due to increased risk factors for smoking, such as the stress of dealing with stigma (Centers for Disease Control and Prevention, 2015). Notably, those experiencing high psychological stress (40.6%) had significantly higher smoking prevalence than those without serious psychological distress (14.0%). The most striking difference in prevalence was by education level, from a high of 34.1% in those who earned a GED to a low of 3.6% in those who earned a graduate degree (Jamal, 2016).

Smoking Prevalence in Young Adults

In order to decrease the prevalence of cigarette smoking in the U.S., especially among the populations mentioned above, it is important to address this problem in adolescents and young adults, or individuals. For the purposes of this thesis, individuals ages 18-26 will be considered “young adults.” Over 80% of adult cigarette smokers smoked their first cigarette before the age of 18, and 99% began smoking before the age of 21 (U.S. Department of Health and Human Services, 2014). Furthermore, initiating smoking at a young age is more likely to lead to nicotine addiction than initiating smoking at a later age, and adolescents may not fully realize the danger of becoming addicted (Sims & Committee on Substance Abuse, 2009).

Young adults attending college may be influenced by the campus environment, as this is where they live, socialize, and study for at least four years. Furthermore, starting university represents a transition into a setting where substance abuse is normative, and where students experience increased freedom and independence (Colder et al., 2006). According to 2016 data by the American College Health Association (ACHA), 9.4% of college students reported smoking cigarettes within the past 30 days (American College Health Association, 2016). Similarly, the most recent published data from the American College Health Association National College Health Assessment (ACHA-NCHA-II) at Tufts University showed that 10.2% of Tufts University undergraduate students in 2015 reported smoking cigarettes within the past 30 days (American College Health Association, 2015). Although smoking rates over the past few decades have decreased overall, recent data indicate that more people, particularly youth and young adults, are using multiple tobacco products in addition to cigarettes, including cigars, electronic cigarettes (e-cigarettes), and smokeless tobacco (U.S. Department of Health and Human Services, 2014). This can in part be attributed to a recent increase in both popularity and marketing of e-cigarettes, hookahs, and vaping products among adolescents and young adults (U.S. Department of Health and Human Services, 2014).

E-cigarette use is especially concerning because the impacts of e-cigarettes on overall health have yet to be elucidated (U.S. Department of Health and Human Services, 2014). Furthermore, e-cigarettes are becoming popular both as a conventional cigarette alternative and as a possible method of smoking cessation, acting as an intermediate between cigarette smoking and quitting outright (Hartmann-Boyce et al., 2016). U.S. e-cigarette sales have doubled every year since e-cigarettes were introduced, and reached \$1 billion per year as of August 2013 (Robehmed, 2013). According to data from the National Youth Tobacco Survey (NYTS), e-

cigarettes were the most commonly used tobacco product among both middle school and high school students, and rates are rising (Singh et al., 2016). Data from the NYTS show that overall rates of e-cigarette smoking among high school students rose from 1.5% in 2011 to 16% in 2015 (Singh et al., 2016). Of note, one study found that 12% of e-cigarette users reported never having smoked a conventional cigarette (Sutfin, McCoy, Morrell, Hoepfner, & Wolfson, 2013). E-cigarette use in adolescents and young adults is an area of concern because nicotine could affect adolescent brain development, and could contribute to decreased executive functioning, as well as increased anxiety and depression (Slawecki, Thorsell, El Khoury, Mathé, & Ehlers, 2005; Smith et al., 2006). Furthermore, studies have indicated that e-cigarette smoking can lead to conventional cigarette smoking in the future (Barrington-Trimis et al., 2016). For example, a meta-analysis of six studies on e-cigarette use and smoking intention revealed that adolescents and young adults that had never smoked cigarettes but had used e-cigarettes were more than two times as likely to report intention to smoke conventional cigarettes than those who had never used e-cigarettes (Zhong, Cao, Gong, Fei, & Wang, 2016).

Tobacco Industry: Targeting Youth and Young Adults

Tobacco companies have capitalized on youth and young adults, and research shows that these marketing efforts have caused young people to smoke (U.S. Department of Health and Human Services, 2014). For example, data from California population surveys conducted in 1994 indicate that young adults ages 18-24 were most likely to possess promotional items from tobacco companies (Gilpin, Pierce, & Rosbrook, 1997). Furthermore, investigations of documents from tobacco industries have uncovered explicit efforts to attract young people (Perry, 1999).

Data have shown that tobacco companies specifically target young adults in e-cigarette marketing (Duke et al., 2014). While the Food and Drug Administration (FDA) has heavily regulated cigarettes and other tobacco products since the 1970s, they are just beginning to regulate e-cigarettes (Duke et al., 2014). Cigarette commercials have been banned from television since 1971, but e-cigarettes are not included in these restrictions, and only recently has the FDA required health warnings in e-cigarette marketing tools (Cobb & Abrams, 2014). One study conducted in 2014 found that young adult exposure to television e-cigarette advertisements increased by 321% from 2011 to 2013 (Duke et al., 2014). Because tobacco companies heavily advertise e-cigarettes during a time when there is very little information available about the health effects of e-cigarettes, and regulation of e-cigarettes is sparse since they are relatively new, there is concern that e-cigarettes will undermine the social norms associated with tobacco use (Grana, 2013). Social norms regarding the acceptability of smoking have been shown to affect smoking behaviors, especially among young adults (Stokols, 1996). Therefore, it will be important to keep e-cigarettes in mind when targeting smoking in young adults.

Smoking in Young Adults: Evidence-Based Intervention Strategies at the Individual, Policy, and Institutional Levels

Interventions to address smoking in young adults have employed a variety of methods targeting young smokers at the individual, policy, and institutional levels. Individual-level strategies generally target knowledge, attitudes, and motivation to quit, as well as offer cessation resources to individuals. Policy level interventions include tax increases on tobacco products and legislation to increase the minimum tobacco purchasing age to 21. Institutional interventions are largely conducted in the university setting and involve changes to campus tobacco policies. These strategies are described in detail below.

Individual-level Interventions: Nicotine Replacement Therapy, Medications, and Motivational Programs

Nicotine Replacement Therapy (NRT), including nicotine patches, chewing gum, lozenges, and nasal sprays, as well as smoking cessation medications, including bupropion and varenicline, are often used for smoking cessation in adults (Stead et al., 2012). However, these products are not yet FDA-approved for individuals under the age of 18. Preliminary studies evaluating the effectiveness of NRT in adolescent and young adult populations have shown limited success with regard to smoking cessation, but have shown the potential to reduce withdrawal symptoms (Karpinski, Timpe, & Lubsch, 2010). The majority of studies analyzing the effectiveness of NRT in adolescents have produced unremarkable results, in that both smoking cessation rates and long-term quit rates have been low (Karpinski et al., 2010). For example, one double-blind, placebo-controlled trial was conducted to assess the impact of NRT therapy (nicotine patch and nicotine gum) therapy on smoking rates (Moolchan et al., 2005). In this study, adolescent smokers ages 13-17 were randomized to one of the following three groups: (1) placebo gum + active patch, (2) placebo patch + active gum, or (3) placebo patch + placebo gum. All participants also completed individual behavioral counseling sessions. While all three groups had a reduction in smoking rates after the 12-week intervention, the differences among groups were not significant. This indicates that likely the reduction in smoking rates could be attributed more to the counseling sessions, and less to the NRT therapies (Moolchan et al., 2005). Therefore, it can be concluded that If NRT is used, it should be based on individual smoking preferences and combined with psychosocial and behavioral interventions (Karpinski et al., 2010).

A review conducted by the Cochrane Tobacco Addiction Group (Stanton & Grimshaw, 2013) analyzed adolescent smoking cessation intervention strategies targeted at the individual

level. The review included 28 randomized-control trials and other controlled trials involving adolescent smokers under the age of 20 who were identified through the Cochrane Tobacco Addiction Group's Specialized Register in 2013. They found that the majority of interventions utilized some form of motivational enhancement strategy, or evoking rapid and internally motivated behavior change rather than stepwise quitting processes. These motivational enhancement strategies usually relied on motivational interviewing, and were often combined with ongoing support and advice on relapse prevention. These studies showed moderate long-term success, although it is difficult to measure the true success of these interventions as a whole because the 28 interventions studied used different definitions for smoking cessation. For example, four of the 28 studies reported sustained abstinence for greater than six months, eight reported 30-day point prevalence, and six reported 7-day point prevalence. Furthermore, the sample sizes and quit rates were small in most of the studies. While a few trials offered nicotine replacement therapies, these trials did not show an additional statistically significant benefit of NRT. Thus, the researchers concluded that the best options for individual level smoking cessation interventions in adolescents are multifaceted interventions, including psychosocial interventions and motivational programs (Stanton & Grimshaw, 2013).

Policy-Level Interventions: Cigarette Tax Increase and Tobacco-21 Movement

According to the Surgeon General's 2014 Report on the health consequences of smoking, placing an excise tax on cigarettes is one of the most effective interventions to reduce smoking prevalence, especially among children and young adults (U.S. Department of Health and Human Services, 2014). Factors that make young people more sensitive to cigarette price increases include the following: that younger smokers are likely less addicted than older smokers who have been smoking longer; that young people have lower and therefore less

disposable incomes; that peer effects like social norms are more prominent among youth; and that young people have been shown to think more about present spending than about long-term spending, and would thus be more responsive to an immediate increase in the cost of smoking (Chaloupka, Cummings, Morley, & Horan, 2002). It is estimated that every 10% increase in cigarette price reduces the number of young adult smokers by about 3.5% (Chaloupka, 1999).

Many states increased excise taxes after the 1964 Surgeon General's report, which was published in the wake of the first scientific studies documenting the health risks of smoking. In 1983, the federal cigarette tax increased from \$0.08 per pack to \$0.16 per pack (Chaloupka et al., 2002). In 2009, the Obama Administration introduced the Children's Health Insurance Program Reauthorization Act, which included a \$0.62 tax increase, raising the federal excise tax on tobacco to \$1.01 per pack (U.S. Department of Health and Human Services, 2014). Furthermore, the President's Fiscal Year 2014 Budget included a \$0.94 per pack federal tax increase (U.S. Department of Health and Human Services, 2014). A notable example of a state tax increase was seen recently in Minnesota. In 2013, Minnesota increased cigarette taxes by \$1.75— this was the largest U.S. state tax increase since 2000. Cigarette data from 403 convenience stores in Minnesota showed that there was a greater yearly reduction in the number of packs purchased during 2013, the year after the tax (-12.1%) than during 2012, the year before the tax (-3.2%, $p < .001$). Since this tax increase occurred during a time where no other large tobacco changes were instituted, this case supports the notion that tax increases can be effective cigarette control strategies (Amato, Boyle, & Brock, 2015).

While tax increases can be useful in reducing cigarette smoking among current adolescents and young adult smokers, prevention strategies aimed to reduce the initiation of smoking habits are also important in changing smoking prevalence among young adults. A

recent policy-level intervention that has shown success in reducing smoking uptake among adolescents across the nation is the “Tobacco-21” Movement. According to the U.S. Department of Health and Human Services, 80% of all smokers become everyday smokers before the age of 21 (U.S. Department of Health and Human Services, 2014). With this in mind, the “Tobacco-21” Movement encourages towns, cities, and states to raise the minimum tobacco purchasing age to 21. If young adults are prevented from smoking before the age of 21, they may be less likely to ever initiate smoking behaviors (“Tobacco Twenty-One,” 2017). One of the first towns to adopt this “Tobacco-21” policy was Needham, Massachusetts in 2005. By 2010, Needham saw a 50% reduction in cigarette smoking, a reduction that was nearly triple that of neighboring suburbs (Winickoff, Gottlieb, & Mello, 2014). Both Medford and Somerville have raised the purchasing age to 21, and in February 2016, the city of Boston Massachusetts raised the minimum tobacco purchasing age to 21 (Ellement, 2015). The impact of these changes on smoking prevalence is not yet known. While Hawaii and California are the only two states to have a statewide Tobacco-21 policy, eight other states have implemented similar policies at the town and county levels, and the state of Massachusetts is in the process of drafting legislation to raise the statewide tobacco-purchasing age to 21 (Miller, 2016; “Tobacco Twenty-One,” 2017).

Institutional-Level Policy: Tobacco-Free Campus

Many colleges and universities around the world have sought to reduce smoking prevalence among college student populations through interventions at the institutional level. These interventions have largely included various types of smoke-free and tobacco-free campus policies, which are often combined with individual level interventions like cessation counseling and NRT products. A “smoke-free campus policy” prohibits the use of *smoke-producing* tobacco products, including cigarettes, cigars, cigarillos, mini-cigars, and hookahs, whereas a “tobacco-

free campus policy” prohibits the use of *any* tobacco product, and would include e-cigarettes, spit tobacco, snuff, and other smokeless products (“Tobacco-Free College Campus Initiative,” n.d.). The ACHA recommends that all colleges and universities promote smoke-free or tobacco-free campuses (American College Health Association, 2017) (Appendix 1). As of April 2017, there were at least 1,827 smoke-free college or university campuses in the United States, 1,536 of which are completely tobacco-free (American Nonsmokers’ Rights Foundation, 2017). Of these, 1,400 also prohibit the use of e-cigarettes (American Nonsmokers’ Rights Foundation, 2017). Smoke-free or tobacco-free policies have been implemented at colleges and universities from 48 out of the 50 states, including public and private, and both two-year and four-year colleges, in addition to many medical school campuses (American Nonsmokers’ Rights Foundation, 2017).

Recent studies have shown that these tobacco-free policies are not only supported by the majority of college students, including smokers, but also have the potential to reduce smoking on campus (Lupton & Townsend, 2015). A meta-analysis of 19 studies conducted between 2006 and 2013 found that roughly 59% of students supported smoke-free policies, and that such policies may reduce smoking and exposure to secondhand smoke (Lupton & Townsend, 2015). Furthermore, as policies of various types— completely smoke-free, smoke-free with designated smoking areas on campus, completely tobacco-free, etc.— have been implemented across the country, differences in approval and effectiveness between these policies have been observed (Fallin, Roditis, & Glantz, 2015). In a 2015 study of eight California college and university campuses with no existing policies, policies allowing designated smoking areas, smoke-free policies, and tobacco-free policies, 1,309 students were asked to complete a survey about on-campus smoking. Students were asked questions about secondhand smoke exposure, exposure to individuals smoking on campus, support for outdoor smoking restrictions, and intention to smoke

on campus. Results showed that 77% of students at schools with tobacco-free policies were in support of the outdoor smoking restrictions. Interestingly, it was found that at schools with full tobacco-free policies, significantly fewer individuals reported exposure to secondhand smoke and observing smokers on campus, compared to schools with no policy at all and schools with smoking restrictions on campus (such as smoke-free with designated smoking areas). Most notably, intention to smoke was significantly lower among students on tobacco-free campuses (3%) compared to those on campuses with no tobacco policy (12%) (Fallin, Roditis, & Glantz, 2015).

While few studies have analyzed the long-term efficacy of smoke-free and tobacco-free policies since these policies are relatively new, the first studies to compare smoke-free and tobacco-free campuses to campuses with no existing smoke-free and tobacco-free policies have shown promising results. For example, researchers at Indiana University-Bloomington found a reduction in smoking behaviors after the implementation of a smoke-free policy (Seo, Macy, Torabi, & Middlestadt, 2011). This study compared data from cross-sectional surveys at two large matched public universities, Indiana University and Purdue University, before and after Indiana University became smoke-free. The analysis showed significant positive changes in smoking behavior, perceptions of peer tobacco use, and smoking norms among students at Indiana University compared to students at Purdue University, where there was no smoke-free campus policy. Specifically, smoking behavior decreased from 16.5% to 12.8% among students at Indiana University in the two years following the implementation of the smoke-free campus policy, whereas at Purdue University the proportion of current cigarette smokers increased during the two-year study period. Furthermore, there was a significant decrease in perceived peer tobacco use at Indiana University, measured by the percentage of students who perceived that 26% of students or more smoked regularly, whereas

perceived peer tobacco use increased at Purdue University. Importantly, smoking norms were also affected by this policy change at Indiana. Over the two years after policy implementation, there was a significant decrease in the proportion of Indiana students who agreed that smoking was acceptable among students, whereas at Purdue the only social norm change observed was an increase in the proportion of students who believed that most people on campus believe that students should be allowed to smoke (Seo et al., 2011).

A recent four-year longitudinal study followed students at a large Midwestern university following implementation of a campus-wide tobacco ban. It was found that at this university, the percentage of smokers decreased from 23.3% to 15.8% and that secondhand smoke exposure significantly decreased over the four-year study period. Over the 4-year study period, there was a significant decrease in students' reports of seeing their friends smoking at parties. Attitudes about smoking behavior also significantly changed over the four years following the policy change. For example, there was a significant increase in respondents' desire to socialize in smoke-free environments (Lechner et al., 2012).

Tufts Tobacco-Free Initiative

Tufts Tobacco-Free Initiative is a group of students and faculty working to make Tufts University a tobacco-free campus. The initiative was formed in January 2014 after a group of students in Tufts' "Introduction to Community Health" class identified eliminating smoking as an intervention that would make Tufts a healthier campus. For the first two years, members of the initiative met with stakeholders in the Tufts community, including the Human Resources department, Community Relations, the Dean's office, Tufts University Police Department, Health Services, the Office for Residential Life and Learning, and Student Affairs, as well as

students and faculty, to discuss the benefits and barriers to Tufts becoming tobacco-free. After conducting research on other local universities who have gone tobacco-free and determining that the majority of stakeholders supported the idea, initiative members collaborated with the Human Resources department to write a policy specific for the Tufts University Medford/Somerville campus (Appendix 5). The initiative members also worked with Health Services to create a plan offering free cessation resources, counseling services, and stress-relieving activities to students and faculty. Over the next few years, Tufts University will be gradually implementing this tobacco-free policy. The Tobacco-Free Initiative will use the data from this investigation to design an implementation and enforcement plan that will best suit the needs of the Tufts community. Hopefully, the current study will also provide insight that can be used by other universities who are looking to become tobacco-free.

Gaps in the literature

While investigations have explored student attitudes toward smoke-free and tobacco-free campus policies, few studies assess student attitudes regarding specific implementation and enforcement strategies, such as which cessation resources college students would take advantage of if offered to them, or on which governing body on campus students believe should be in charge of enforcing the policy. Thus, there is little information available to schools looking to go tobacco-free about how to design the initial stages of their interventions. Also, we were unable to locate published studies that have been conducted during the transition of policy change on a college campus. There are numerous analyses of the implementation of tobacco-free campus policies in large, public university systems, yet there is a paucity of data on the implementation of such policies at medium-sized, private universities like Tufts University. As such, the aims of the present study are to: (1) assess smoking behaviors and perceptions of smoking norms on campus, (2) determine students'

overall support of a tobacco-free policy for the Tufts University campus, (3) evaluate students' perceptions of the benefits and barriers associated with the implementation and attitudes about the enforcement of this policy, and (4) to evaluate how each of these differ by smoking status.

This proposed thesis is being conducted before and during the implementation process for this policy, which is set to go into effect in Fall 2017. Thus, the data that is collected and analyzed will help to guide the gradual integration of the policy within Tufts' campus culture over the next few years, and will also contribute to the development of implementation and enforcement plans. In addition to helping guide the policy change at Tufts, findings may yield insights for other universities that are looking to adopt tobacco-free campus policies, especially if they have similar campus demographics to Tufts in terms of size, location, and culture.

APPROACH

Overview

This study was conducted in two phases. In Phase 1, existing data from the Tufts University “First Year and Sophomore Experience Survey” (**FYSES**) was analyzed. This online survey was conducted by the Tufts University Office of Institutional Research and Evaluation in the spring of 2015, and consists of 56 questions about student life at Tufts University. Topics addressed in this survey include academic curriculum, student advising, and campus policies, including a question about support for a tobacco-free campus policy.

In Phase 2, an online survey entitled “Tobacco Policy Knowledge, Attitudes, and Perceptions Survey” (**KAPS**) was administered to all current Tufts University undergraduate students within the School of Arts and Sciences and Engineering in the spring of 2017. This survey assessed (a) smoking behaviors, as well as perceptions of smoking behaviors on campus, (b) level of support for tobacco-free policies, and (c) perceptions of the benefits and barriers to the implementation and attitudes about the enforcement of a tobacco-free policy at Tufts. The FYSES was included in this analysis because it contained a question about policy support that was also included in the KAPS. This allowed for a comparison between two time points, to see whether student support for a tobacco-free campus policy at Tufts has changed over the past three years. For each of the two phases, methods and results are presented separately below.

PHASE 1: FYSES

Methods

The FYSES was sent to all first-year (n=1,343) and sophomore (n=1,286) undergraduate students registered for full-time study within Tufts University schools of Arts and Sciences and

Engineering during the spring of 2015. Students were sent an email invitation to the study with a link to an anonymous online survey in Qualtrics. Students were required to view informed consent information prior to proceeding to survey questions. Four reminder emails were sent over a one-month period to encourage non-respondents to participate in the survey. Of the 2,629 individuals who received the survey, 1,422 (54.1%) respondents answered the question about tobacco-free campus support. These respondents (n=1,422) comprise the analytic sample for this phase of the study.

Measures

Support for a tobacco-free policy was assessed with a single item: “Please indicate your level of support for the Tufts Medford/Somerville campus becoming a “tobacco-free” campus,” with responses on a five-point Likert scale from “strongly oppose” to “strongly support.” Tufts University study investigators designed the question on student support for a tobacco-free policy for the FYSES based on a similar question in the literature assessing institutional policy change (Seo et al., 2011). Standard *demographic questions*, including gender, race, ethnicity, sexual identity, and class year, were also included.

PHASE 2: KAPS

Methods

The KAPS (Appendix 4) was sent to all current Tufts undergraduate students (n=5,309) on March 29th, 2017 via a Qualtrics link in a recruitment email. An initial invitation was emailed to students, and a follow-up email was sent after one week encouraging non-respondents to complete the survey (Appendix 3). Data collection ended one week after the follow-up email was sent. The survey was publicized on the Tufts University class Facebook pages, and was also sent

out to an email-list of students involved in health-related clubs (Appendix 3). A consent form was displayed as the first page of the Qualtrics survey, and all respondents consented to participation before filling out the rest of the survey. Students were reminded at the start of the survey that it was anonymous and that no identifying information would be stored with the data. After completing the survey, participants were offered the opportunity to enter a prize drawing for one of six \$50 Amazon gift cards. In order to maintain anonymity, the Qualtrics survey to enter the prize drawing was on a completely separate web page from the page containing the survey. All study procedures and materials were approved by the Tufts University Institutional Review Board for Expedited Review #1611007 (Appendix 2). Out of the 1,495 (28.16%) eligible individuals who began the survey, 1,112 (20.95%) individuals completed the entire survey and were included in this analysis.

Measures

The KAPS contains 26 closed-ended questions assessing (a) smoking behaviors and perceptions of smoking norms on campus, (b) level of support for tobacco-free policies, (c) perceptions of the benefits and barriers to the implementation and attitudes about the enforcement of a tobacco-free policy at Tufts. Most items for the KAPS were selected from validated questions from the American College Health Association National College Health Assessment (ACHA-NCHA-II) (American College Health Association, 2016) and the CDC Behavioral Risk Factor Surveillance System (BRFSS) (“CDC - BRFSS,” 2016), as well as questions from published peer-reviewed literature (Fallin et al., 2015; Seo, Macy, Torabi, & Middlestadt, 2011). In addition to these questions, seven additional items were developed because we were unable to identify any published study that assessed specific constructs in our analysis plan. Questions that were developed pertained specifically implementation and

enforcement at Tufts University, and asked about specific aspects of Tufts campus that would not be addressed by validated questions in pre-existing literature. All written questions were approved by Jennifer Allen, the chair for this thesis. The survey items are summarized below.

Smoking behaviors were assessed with five standard questions from the NCI (“NCI Thesaurus,” 2016) and one written question. Questions from the NCI included the following: (1) “Do you currently smoke cigarettes every day, some days, or not at all?” with the choices “every day,” “some days,” and “not at all,” (2) “Have you smoked at least 100 cigarettes in your entire life?” with the choices “yes” and “no,” (3) “During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?” with the choices “yes” and “no,” (4) “How long has it been since you last smoked a cigarette, even one or two puffs?” with an eight-point scale ranging from “never smoked regularly” to “within the past month.” The following question was written to assess where Tufts students purchase cigarettes: “Where do you purchase cigarettes?” with the choices “convenience stores,” “drug stores,” “grocery stores,” “gas stations,” “smoke shops,” and “other.” *E-cigarette smoking behaviors* were assessed with the following two questions from the BRFSS (“CDC - BRFSS,” 2016): (1) “Have you ever used an e-cigarette or other vaping product, even one time, in your entire life?” and (2) “Do you now use e-cigarettes or other “vaping” products every day, some days, or not at all?”

Perception of campus smoking norms was assessed with questions four questions, two from pre-existing literature (Fallin et al., 2015) and two from the ACHA-NCHA-II (American College Health Association, 2016). The following questions from pre-existing literature were used: (1) “In the past 7 days, have you seen someone smoking cigarettes on campus? With the choices “yes” and “no;” (2) “In the past seven days, have you been exposed to other people’s tobacco smoke on campus?” with the choices “yes” and “no.” The following questions from the

ACHA-NCHA-II were used: (1) “Within the past 30 days, how often do you think the typical student at your school used cigarettes?” with an eight-point scale from “never used” to “used daily;” (2) How many students do you think regularly smoke on campus?” with a seven-point scale from “0-10%” to “91-100%.”

Support for a tobacco-free policy was assessed using the following question from the FYSES (2015): “Please indicate your level of support for the Tufts Medford/Somerville campus becoming a “tobacco-free” campus,” with responses on a five-point Likert scale from “strongly oppose” to “strongly support.”

Perceptions of the benefits and barriers associated with the implementation of this policy were assessed using seven items from pre-existing literature (Seo, Macy, Torabi, & Middlestadt, 2011) as well as three written questions specific to Tufts. The items from pre-existing literature were measured with a five-point scale from “strongly agree to “strongly disagree,” and were written as follows: (1) “Regulation of smoking in public places is a good thing,” (2) Smoking among students is acceptable,” (3) “I worry about being exposed to secondhand smoke on the Tufts campus, (4) Most people on this campus believe students should be allowed to smoke,” (5) I would be less likely to smoke on campus if my school had a tobacco-free policy,” and (7) “Regulation of smoking in outdoor places is a good thing.” The written questions were: (1) “Would a tobacco-free campus policy at Tufts affect you positively, negatively, or not at all?” with the choices “positively,” “negatively,” and “not at all,” (2) Does Tufts offer tobacco cessation services for students?” with the choices “yes” and “no,” and (3) which of the following cessation resources would you take advantage of if they were readily available to you?” with the choices “nicotine replacement therapy,” “prescription medications,” “quit kits,” “cessation counseling or support groups,” “stress-relieving activities,” and “other.”

In order to gather information that would be useful in the development of an implementation and enforcement plan for Tufts, the following three written questions were asked: (1) Do you think that the policy should be enforced like other campus policies are enforced at Tufts?" with the choices "yes" and "no," (2) Which of the following strategies do you think should be employed in the enforcement of this policy?" with the choices "punitive measures," "written warnings," "discussions with staff about smoking violations," "anonymous online reporting system, and "other," and (3) "Who do you think would be responsible for enforcing a tobacco-free policy on the Tufts campus?" with the choices "Tufts University Police Department," "Office of Residential Life and Learning," "Office of Student Affairs, Judicial Affairs," "Tufts community members/bystanders," and "other."

Standard *demographic questions*, including gender, race, ethnicity, sexual identity, and class year, were also included.

Analysis

Data from the FYSES was manually entered into Microsoft Excel from published reports of the data stratified by class year (first-year or sophomore) and by school (School of Arts & Sciences or School of Engineering) (Tufts University Office of Institutional Research and Evaluation, 2015). Data from the KAPS was first exported from Qualtrics as a CSV file. In Microsoft Excel, the variables were re-named to be easier manipulated in R-Studio software, and unnecessary information was removed from the dataset. The complete case method was used: participants who did not select an answer every question on the survey were excluded from the dataset. Out of the 1,495 individuals that started the survey, 1,112 individuals completed every question of the survey. Thus, 383 (25.6%) individuals were excluded from the dataset. The 1,112 individuals who completed the entire KAPS comprised the analytic sample for this survey.

The dataset was then imported into R-Studio for statistical analysis. Analysis included descriptive statistics on the individual items and scaled variables, as well as bivariate analyses on the interrelationships between constructs in the KAPS. The NCI defines a “current smoker” as someone who has smoked more than 100 cigarettes in his or her lifetime and has smoked cigarettes every day or some days in the past 30 days (“NCI Thesaurus,” 2016). Based on this definition, we further classified “current everyday smoker” as someone who reported smoking *every day* in the past 30 days and reported smoking at least 100 cigarettes in his/her lifetime, and “current someday smoker” as someone who reported smoking *some days* in the past 30 days and reported smoking at least 100 cigarettes in his/her lifetime. Chi-Square and T-test analyses were conducted to detect differences between smokers and nonsmokers in support for the policy, perceived campus smoking norms, perceived benefits and barriers to implementation, attitudes about enforcement strategies, and demographic information.

All data from both the FYSES and KAPS were stored on TuftsBox, a password-protected data storage server. No identifying information was stored with the data.

RESULTS

PHASE 1: FYSES

Sample Characteristics

On the FYSES (2015), 1,422 (54.1%) individuals answered the question about tobacco-free campus support. The sample consisted of relatively equal numbers of each gender, with slightly more female (43.53%) participants than males (40.29%). There were relatively equal proportions of each class year, with slightly more sophomores (45.36%) than freshmen (40.64%). The sample was fairly homogenous with respect to race and sexual orientation, with 60.06% of the sample being white and 70.75% of the sample being heterosexual (see Table 1).

Support for Tobacco-Free Policy

On the FYSES (2015), 65.10% of students reported that they strongly or moderately supported Tufts becoming a tobacco-free campus; 15% of students reported that they neither supported nor opposed the policy, and 19.8% of students strongly or moderately opposed the policy (see Table 3).

PHASE 2: KAPS

Sample Characteristics

1,112 (20.95%) current Tufts University students completed the entire KAPS. The sample consisted of relatively equal numbers of each gender, with slightly more female respondents than males. There were a relatively equal number of respondents from each class year. The sample was fairly homogenous with respect to race and sexual orientation, with 67.36% of the sample being white and 75% of the sample being heterosexual (see Table 1).

Smoking behaviors

Out of the 1,112 respondents, 34 (3.06%) students reported currently smoking cigarettes every day, and 130 (11.69%) students reported currently smoking some days. 107 (9.62%) of these respondents reported smoking every day or some days *and* reported smoking at least 100 cigarettes, and were thus classified as “current everyday or someday smokers” (see Table 2). Of the 107 smokers, 55 (51.40%) reported that they had attempted to quit smoking at some point during the past 12 months (see Table 2). When asked about e-cigarette use, 66 (5.94%) respondents reported using e-cigarettes every day (0.99%) or some days (4.95%) in the past 30 days (see Table 2).

Bivariate analyses revealed that there were more male smokers (16.01%) than female smokers (3.88%). There were slightly higher percentages of smokers who were American Indian/Alaska Native (11.11%) or Black (10.25%), although the sample sizes for those who reported being American Indian/Alaska Native ($n = 9$) or Black ($n = 39$) were so small that smoking prevalence in these populations may not be indicative of national trends. There were no major differences in smoking prevalence based on sexual orientation. Chi-Squared tests of statistical significance were not feasible for these bivariate analyses given the small cell size for smokers and for some of the races.

Current smokers reported purchasing cigarettes at convenience stores (89.71%), gas stations (56.07%), smoke shops (42.99%), grocery stores (21.50%), and drug stores (15.89%). Three (2.80%) current smokers wrote in the “other” response option that they purchase cigarettes at Leavitt & Peirce Inc., a tobacco shop located in Harvard Square, and five (4.67%) current smokers wrote that they purchase cigarettes at duty-free shops. 51.51% of smokers reported that they have tried to quit smoking at some point in the past 12 months.

Perceived Smoking Norms

982 (88.30%) students reported seeing someone smoking on campus within the past seven days. When asked about secondhand smoke exposure, 749 (67.35%) students reported being exposed to secondhand smoke within the past seven days, and 460 (41.37%) students reported that they agreed with the statement “I worry about being exposed to secondhand smoke.” 626 (56.29%) students reported that they think greater than 10% of Tufts students regularly smoke cigarettes on campus, and 103 (9.26%) students reported that they think the typical student used cigarettes at least 10 out of the past 30 days (see Table 3). More non-smokers (45.77%) than smokers (0%) reported being worried about secondhand smoke exposure.

Support for Tobacco-Free Policy

On the KAPS (2017), 51.62% of students reported that they strongly or moderately support Tufts becoming tobacco-free; 9.35% of students reported that they neither support nor oppose Tufts becoming tobacco-free; 38.94% of students strongly or moderately oppose Tufts becoming tobacco free (see Table 4). When asked if a tobacco-free campus policy would affect them positively, negatively, or not at all, 45.59% of students selected “positively,” 2.24% selected “negatively,” 26.88% selected “not at all,” and 25.29% selected “don’t know/not sure” or “prefer not to answer.”

Support for the policy was much lower among current smokers (0.93%) than current non-smokers (57.01%). A Chi-Squared test of statistical significance for this bivariate analysis was not feasible due to small cell sizes for smokers.

Benefits and Barriers to Implementation

715 (64.30%) respondents strongly or moderately agree with the statement, “regulation of smoking in public places is a good thing;” 626 (56.29%) respondents agree with the statement,

“most people believe that students who smoke should quit;” and 318 (28.60%) respondents agree with the statement, “Most people on the Tufts campus believe that students should be allowed to smoke” (Table 5).

When asked about whether cessation resources are currently offered at Tufts University Health Services, 898 (80.76%) respondents answered “unsure.” Current smokers were also asked what cessation resources they would take advantage of if they were available at Tufts University Health Services- the results to this question are summarized in Table 5. The most frequently selected cessation resources were “stress-relieving activities, such as massages, meditation, etc.” (45.79%) and “prescription medications, such as Bupropion, Varenicline, and Nortriptyline” (28.04%) (see Table 5).

Attitudes about Enforcement

When asked which strategies should be used in the enforcement of a tobacco-free policy at Tufts, 482 (43.35%) students selected “written warnings,” 421 (37.86%) students selected “discussions with staff about smoking violations, 312 (28.06%) students selected “punitive measures, such as probation or fines,” and 238 (21.40%) selected “anonymous reporting system.” When asked who should be in charge of enforcing a tobacco-free policy at Tufts, 496 (44.60%) students selected “Tufts University Police Department,” 473 (42.54%) students selected “The Office of Residential Life and Learning,” 347 (31.20%) students selected “Office of Student Affairs, Judicial Affairs,” and 299 (26.89%) selected “Tufts community members/bystanders.” Finally, 488 (43.88%) of students reported that they believe a tobacco-free policy “should be enforced like other policies at Tufts” (see Table 5).

DISCUSSION

For the past four years, students, faculty, and administrators at Tufts University have explored the idea of Tufts becoming a tobacco-free campus to reduce secondhand smoke on campus and to promote health for all members of the Tufts community. A tobacco-free policy (Appendix 5) has already been written by the Tufts Tobacco-Free Initiative and the Human Resources department, but has not yet been implemented because the university wanted to first gather data about campus smoking behaviors, norms, and student attitudes surrounding a tobacco-free campus policy in order to develop an implementation and enforcement plan for the next few years. The present study is one of the first analyses examining student perceptions of smoking behaviors and attitudes about a tobacco-free campus just before policy implementation in a university setting.

On the KAPS, 3.06% of current Tufts University undergraduate students reported smoking cigarettes every day in the past 30 days. This percentage is higher than the percentage of everyday smokers reported on the Tufts ACHA-NCHA-II conducted in 2015 (0.2% used daily, 1.0% used 20-29 days) and on the National ACHA-NCHA-II conducted in 2015 (2.5% used daily, 1.7% used 10-29 days) (American College Health Association, 2015, American College Health Association, 2016). Smoking rates at Tufts University are actually much lower than smoking rates observed in pre-existing literature on tobacco-free college initiatives (Fallin et al., 2015; Lechner et al., 2012; Seo, Macy, Torabi, & Middlestadt, 2011), although these studies were conducted at large, public universities in the West and Midwest. Therefore, the findings of the current study will be much more applicable to implementing a tobacco-free campus policy at Tufts than previous literature.

The higher percentage of everyday smokers observed on the KAPS is likely due in part to the complete case method used to clean the dataset. It is probable that the majority of the 383 subjects who were removed were nonsmokers, since the Tufts ACHA-NCHA-II indicates that there are very few everyday smokers at Tufts University (American College Health Association, 2015). Thus, the percentage of respondents who are everyday smokers is likely an overrepresentation of the actual prevalence of everyday smokers on the Tufts campus. Notably, over half of current smokers reported that they have tried to quit smoking at some point in the past 12 months. This provides evidence that a tobacco-free campus policy with an implementation plan that features cessation resources and information for smokers trying to quit could be beneficial for current Tufts students who smoke.

Bivariate analyses revealed a difference in smoking prevalence by gender, in that a greater proportion of males (16.01%) than females (3.88%) reported being current smokers. This difference is much larger than the difference reported in the 2015 CDC data indicating that only slightly more males than females regularly smoke (Jamal, 2016). Based on the 2015 CDC data, we expected to see a higher in smoking prevalence in LGBTQ individuals compared to heterosexual individuals, however this trend was not observed. Similarly, we expected to see higher smoking prevalence among American Indians/Alaska Natives, and while this trend was observed in our data (11.11% in American Indians/Alaska Natives compared to 9.56% in the whole cohort), we cannot be confident that a true difference exists because Chi-Squared analyses were not conducted. Chi-Squared tests could not be conducted due to small cell sizes, both for regular smokers and for some of the demographic characteristics we were interested in analyzing.

The results of the KAPS imply that students at Tufts largely overestimate the prevalence of smoking at Tufts. For example, 56% of the respondents believed that 10% or more of Tufts students smoke regularly on campus, when in reality this number is much lower. This perception was even higher in smokers, 62% of which believed that 10% or more of students smoke regularly. Overestimating the proportion of smokers on campus is a trend that has been seen before— Seo et al. (2011) found that 73.6% of students at Indiana University and 59.2% of students at Purdue University overestimated the percentage of students who were current smokers. Perhaps students overestimate smoking prevalence at Tufts because they are exposed to secondhand smoke on campus. 67% of respondents reported being exposed to secondhand smoke in the past 7 days. The increased perception of smoking prevalence on campus may be in part due to smokers congregating at high-traffic areas on the Tufts campus, such as the Tisch Library patio (Nasser & Serhan, 2017). It could also be that students perceive that there are many different students smoking, but in reality it the same small group of students may just be smoking frequently in the same location. It is important to address this overestimation, because perceived smoking prevalence and peer smoking have been shown to predict smoking behavior in young adults (Chassin, Presson, Sherman, & Edwards, 1991).

Drivers of Support and Opposition toward a Tobacco-Free Campus

Over 60% of respondents reported either support or neutrality toward the idea of Tufts University becoming a tobacco-free campus. Notably, because the “support for a tobacco free campus” question on the KAPS was the exact same question as what was asked on the FYSES, data from two years at Tufts could be compared. Overall support for the policy was found to be lower on the KAPS in 2017 (51.62%) than on the FYSES in 2015 (65.10%). One possible explanation for this finding is that the FYSES data was collected just as the idea of a tobacco-

free campus was first being considered at Tufts, whereas the KAPS was conducted after a significant amount of publicity indicating that Tufts would be implementing a tobacco-free policy in the future. Tufts student publications, including the Tufts Daily and the Observer, published multiple news and opinion-based articles in February and March of this year, focusing on possible issues with the potential policy change including the marginalization of minority groups and low-income students (Nasser & Serhan, 2017; Steiner, 2017) (Appendix 6).

Therefore, support for the policy could have decreased in the wake of publicity and information dissemination on campus. Also, the percentage of students who selected “neutral” when asked about support for the tobacco-free policy was much smaller on the KAPS (9.35%) than on the FYSES (15%). This could be in part because freshmen and sophomores in the School of Engineering were required to fill out the FYSES in 2015, whereas the KAPS was completely voluntary. Perhaps those who feel indifferent about the policy change did not fill out the KAPS because they were not required to do so, whereas those in support and opposition felt incentivized to share their views.

Although the percentage of students in support of a tobacco-free campus observed in the current study is slightly lower than observed levels of support on the FYSES, it seems to be comparable to overall trend for support seen in existing literature (Lupton & Townsend, 2015). One of the only systematic reviews and meta-analyses on currently existing smoke-free policies, conducted by Lupton & Townsend (2015) compared the acceptability and effectiveness of smoke-free policies from 19 universities. They found that student support for a smoke-free policy before implementation ranged from 46.3% to 76% (*Median* = 58.5%) (Lupton & Townsend, 2015). Notably, the researchers found that two of the 19 studies they analyzed measured student attitudes after the implementation of the policy, and that both studies reported

increases in average student support. The first (Seo, Macy, Torabi, & Middlestadt, 2011) reported an increase in student support from 57.5% before implementation to 62.5% two years after implementation, and the second (Lechner et al., 2012) reported an increase from 4.57 before implementation to 5.77 three years after implementation on a scale from 1-7. The results of this meta-analysis indicate that the pre-implementation level of student support for a tobacco-free policy at Tufts is comparable to levels of support at other schools that have successfully implemented smoke-free and tobacco-free policies. Furthermore, the results imply that support for the policy at Tufts is likely to increase in the years following implementation.

Despite the fact that most people are well aware of the dangers of smoking and exposure to secondhand smoke, many students, including nonsmokers, are still in opposition to tobacco-free campus policies (Niemeier, Chapp, & Henley, 2014). Researchers investigating what drives support and opposition of tobacco-free policies have found that health benefits are often not the primary reason for support. For example, in an investigation of students from a Midwestern public university, Niemeier, Chapp, & Henley (2014) found that the most frequent reasons for support cited by students in support of the policy were focused more on environmental/aesthetics (39.5%), and less on health benefits (17.8%). Opposition, on the other hand, was found to be primarily driven by moral rights: 54.5% of those opposed to a tobacco-free campus cited liberty or personal freedom as the main reason why they opposed a campus smoking ban (Niemeier, Chapp, & Henley, 2014).

A main point in the debate over the ethics of tobacco-free policies is the conflict between the individual right to smoke and the collective right to clean air. Interestingly, one study found that 82% of smokers and 98% of nonsmokers believe that the right to breathe clean air should take priority over the right to smoke (Berg et al., 2011). At Tufts, concerns about these

conflicting rights have been voiced in student publications, and are largely concerning the belief that a tobacco-free policy would disproportionately affect marginalized groups of students (Steiner, 2017; Todd, 2015) (Appendix 6). These concerns are understandable, since smoking rates are higher in marginalized groups including individuals with low socio-economic status and LGBTQ individuals (Jamal, 2016). Thus, it will be important for administrators to keep this concern in mind, and to work with the Tufts community to make sure the policy does not disproportionately affect any groups on campus.

Finally, research has shown that Caucasian students exhibit the greatest opposition to tobacco-free policies (Loukas, Garcia, & Gottlieb, 2006). The fact that the KAPS sample was 67.36% Caucasian, an overrepresentation compared to the overall Tufts population (56.6%), could partially explain the slightly higher rates of opposition to the policy change seen in the current study compared with previous studies.

Limitations

This study contained several limitations that should be acknowledged in order to fully understand the results and their implications. As with all studies that rely on self-report data, the validity of responses is questioned, and selection bias is a concern because of low response rates on both the FYSES and the KAPS. The main limitation of this study is its cross-sectional design. The present study was conducted before the tobacco-free policy was placed into effect at Tufts. Although the goal of this investigation was not to assess efficacy of tobacco-free policy at Tufts, a longitudinal study assessing students' smoking habits before, during, and after the implementation of a tobacco-free campus policy would provide valuable information moving forward. The investigators were only able to locate two articles assessing students' smoking behavior and attitudes before and after the implementation of smoke-free campus policies

(Lechner et al., 2012; Seo, Macy, Torabi, & Middlestadt, 2011), and both of these investigations were cross-sectional studies conducted at large, public universities. Therefore, although the findings are valuable, they may not necessarily be generalizable to medium-sized private schools like Tufts University. In the future, a longitudinal study should be conducted at Tufts, following freshman students over their four years in college, assessing their smoking habits and perceptions of smoking on campus in response to policy change.

Another limitation is that analysis relied on the complete case method, where any participant who left a question blank was eliminated from the dataset. This resulted in the elimination of data from 383 respondents. Ideally, only the participants who did not answer the questions for our key constructs (smoking behaviors, support for policy, etc.) would have been eliminated from the dataset, and those who may have only skipped a demographic question would have been kept. Unfortunately there was not enough time during the study period to individually sort through each participant to assess which question(s) each participant skipped, but future analysis could look at the same dataset but without eliminating every participant who left a question blank. Also, there was no restriction on Qualtrics preventing individuals with the survey link from filling out the survey multiple times. Therefore, it is possible that there were duplicate responses in the dataset. Since all responses were anonymous, we had no way of checking for duplicates, so it was possible for those who felt strongly about the policy to respond multiple times.

Also, the current study utilized a survey (KAPS) that consisted of validated, closed-ended questions from the ACHA-NCHA-II, BRFSS, and previously published peer-reviewed literature (Fallin et al., 2015; Seo, Macy, Torabi, & Middlestadt, 2011), as well as eight new questions created specifically for this survey. Having only closed-ended questions could have prevented us

from detecting certain variables that we would perhaps be able to identify with a more extensive survey. The survey contained only 1-2 questions per construct we were measuring because we did not want the survey to be so long that it discouraged participants from completing it, however asking more questions pertaining to each construct would have potentially yielded more specific data to analyze. Furthermore, since we used questions that we wrote ourselves, which were not validated or tested through psychometric analyses, we could have been unsuccessful in fully measuring the constructs that we were aiming to measure. However, we created the “support for a tobacco-free policy” question based on previous literature that utilized a similar question (Seo, Macy, Torabi, & Middlestadt, 2011), and used this question on both the FYSES in 2015 and the KAPS in 2017 in order to compare students’ levels of support across two different time periods.

Another limitation is that the present study was conducted shortly after a rise in publicity about Tufts University potentially becoming a tobacco-free campus. As previously mentioned, Tufts news outlets, mainly the Tufts Daily and the Observer, released a number of opinion-based articles in the weeks preceding the KAPS survey (“Editorial,” 2017; Najarro, 2017; Nasser & Serhan, 2017; Reidi, 2017; Steiner, 2017) (Appendix 6). These articles may have influenced students’ perceptions of smoking norms, opinions about policy change at Tufts, and views about how this policy should be implemented and enforced. Furthermore, smoking rates were found to be three times higher based on the KAPS (2017) data than based on the Tufts ACHA-NCHA-II (2015), indicating selection bias toward smokers filling out the survey.

Although 107 smokers completed the entire survey, many of these individuals selected the “prefer not to answer” choice on multiple questions. This lack of response may be because students who smoke did not feel comfortable honestly answering the questions on this survey

due to the fact that it was a community health survey, and smoking is stigmatized in the community health context. An alternative explanation is that respondents who smoke could have felt annoyed by the content of the survey and by the tobacco-free campus idea in general, and therefore chose not to answer questions pertaining to policy support, implementation, and enforcement. Regardless, the number of responses from smokers was often too low to show statistical variability. Data from those who smoke is crucial for this initiative as well as for future work on college campus policies, as smokers are likely to be affected most by the policy change. Thus, it is important for Tufts administrators and community health leaders to seek input from smokers in the months leading to and following the implementation of a tobacco-free campus at Tufts. Open forums could be held on campus to allow members of the Tufts community, both smokers and nonsmokers, to voice their opinions about how the policy change should occur. An anonymous feedback system could be created to allow students to anonymously share their thoughts with administrators involved with the initiative. Finally, focus groups with students who smoke could be conducted, although researchers may run into the same problem that was encountered in this study if smokers do not speak up because of fear of stigmatization.

Only descriptive statistics and bivariate analyses were done for this study. Furthermore, bivariate findings could not be verified by Chi-Squared analysis due to the small number of smokers who responded to each item. This work would have been stronger with multivariate analysis, because bivariate analysis does not account for many possible variables that could be confounding the variables that were compared. A future study could use this same dataset but expand the findings with multivariate analysis.

Finally, the fact that this study was conducted only among undergraduate students at Tufts University means that the findings are not generalizable to graduate students at the

Medford/Somerville campus, to other environments, such as medical campuses or public parks, or even to other college or university campuses. That being said, the current study still provides valuable information, especially since the respondents of this survey are a relatively representative of the overall student body at Tufts with respect to gender, race, ethnicity, and class year, although this cohort slightly overrepresented White and Asian races (“Diversity Data,” 2016). Because the data is specific to Tufts, it can be used to design an implementation and enforcement strategy that best fits the Tufts University campus environment, and will thus hopefully be maximally effective in reducing smoking prevalence and secondhand smoke exposure on the Tufts University campus.

Implications for Practice: Recommendations for an Implementation and Enforcement Plan

The present study was conducted because Tufts Tobacco-Free Initiative and the Tufts Administration sought information from students about what factors are important to consider when designing a multi-year policy implementation and enforcement plan. Based on the results of this study, the investigators recommend the inclusion of the following implementation and enforcement strategies.

First, the investigators recommend that Tufts creates a “Tufts Tobacco-Free Campus” website that will be connected to the Tufts Health Services website. This website could include the exact wording of the policy, statistics about smoking behaviors at Tufts, frequently asked questions, a map of the Tufts campus indicating where people can and cannot smoke, recent news pertaining to the Tobacco-Free Initiative and to the policy, and information about cessation resources offered at Tufts. In addition to providing valuable and educational information for students, this website could increase accuracy of perceived smoking norms at Tufts. Many

colleges and universities that have gone tobacco-free have included similar websites in their implementation plans. The Tufts Tobacco-Free Campus website could perhaps be modeled after Northeastern University or Syracuse University's smoke-free and tobacco-free websites, which display a great deal of useful information in a comprehensive way ("Smoke-Free Campus Northeastern University," 2014, "SU Tobacco-Free Campus," 2015).

During implementation, it will be important to keep in mind the marginalized groups that may be disproportionately affected by this policy. The KAPS results showed that the majority of students agree that regulation of smoking in public places is a good thing, and that the regulation of smoking in outdoor places is a good thing. Only 2% of respondents reported that a tobacco-free campus policy would affect them negatively. Yet, there is still opposition to the policy. This may imply that students are well aware of the harms of smoking and of exposure to secondhand smoke, but are opposed to the policy for reasons related to the marginalization of minority groups or the individual rights of smokers. These views were voiced in recent Tufts publications (Nasser & Serhan, 2017; Steiner, 2017) (Appendix 6). In order to increase support for the policy as well as involve community members in the implementation process, the researchers recommend that administrators continue to gather student feedback, with open-ended strategies whenever possible. Conversations should be held on the Tufts campus, perhaps in open-forum style, both before implementation and throughout the first few years after implementation. This will allow the Tufts administration to insure that no particular groups feel marginalized by the policy and that individual rights of smokers are kept in mind. However, it should be kept in mind that typically those who feel most strongly about the policy, either strongly in support or strongly opposed, are most likely to come to events like these. Therefore, the views of students at these open forums may not be representative of the views of the majority of Tuft students.

Furthermore, the Tobacco-Free Initiative could collaborate with student organizations on campus, such as the LGBT center, to run specific programs providing information and resources to groups that may feel marginalized by the policy. Advertisements and information on the Tufts Tobacco-Free Campus website should not focus too much on the health benefits to the policy, but should instead focus on the idea of a positive campus environment for all, including smokers. Also, data should be collected annually for the first few years following policy implementation to assess whether the policy is meeting the needs of as many Tufts community members as possible. This could be in the form of a written survey like the KAPS, or could simply be a few questions on a different student survey.

Based on student feedback from this survey, the most important cessation resources to offer for students include meditation and stress relieving activities, prescription medications, and cessation counseling. The Tobacco-Free Initiative has been working with Health Services for the past few years to make sure that such services will be offered to students at little to no cost. One specific project that the Tobacco-Free Initiative will be undertaking is the creation of homemade “quit kits” with items such as stress balls, cinnamon gum, and business cards for the National Cancer Institute Tobacco Quitline, which can be given to Tufts students for free. These quit kits are inexpensive and simple to make in large batches. However, the tobacco-free initiative should reach out to smokers prior to assembling these quit kits to see if smokers would actually be interested in utilizing these products. It will be especially important for Health Services to train a few of their staff members on how to give smoking-related counseling to students and how to run smoking-related support groups, as the staff does not currently have counselors trained in smoking cessation counseling. Recently, Health Promotion and Prevention has started a new mindfulness initiative to reduce stress on campus (“Health Promotion and Prevention, Tufts

Student Services,” 2017). It would be beneficial for the Tobacco-Free Initiative to join forces with this mindfulness initiative to design mindfulness activities specifically for smokers. The Tobacco-Free Initiative should also collaborate with other health groups on campus, such as Tufts Active Minds or the Tufts Public Health Society to offer various types of stress-relieving activities, since multiple Tufts students have explained that they smoke to relieve stress (Nasser & Serhan, 2017). Finally, one of the most striking findings of this investigation was that very few individuals were aware of what cessation resources were offered at Health Services. It will thus be important to heavily advertise these services during the implementation process.

Data from schools that have already gone tobacco-free indicate that the main challenges associated with policy enforcement are (1) who is responsible for enforcement, and how should it be done without legal authority and (2) how should the issue of personal rights be dealt with (Baillie et al., 2009). Based on KAPS results, the majority of students still think that Tufts University Police Department (TUPD) will somehow be involved in the enforcement of this policy, despite multiple Tufts publications in which it is stated that TUPD will not be involved in the enforcement of this policy (Najarro, 2017; Steiner, 2017) (Appendix 6). It will be important to emphasize throughout the enforcement process that TUPD will not be the main driver of enforcement for this policy. Furthermore, many students reported that they believe the Office of Residential Life and Learning should be involved in policy enforcement. This could perhaps imply that students are exposed to secondhand smoke due to congregated smokers outside dormitories. Therefore, the Office of Residential Life and Learning should definitely be included in educational efforts on the policy change. For example, information about the policy and cessation resources available from Health Services could be included as part of Resident Assistant (RA) training, so that RAs can provide students in their dorms, especially incoming

freshman, with appropriate information as they start college in the fall. Information on the tobacco-free policy and quitting resources could also be included as part of the Tufts freshmen orientation program, although orientation week is already quite busy, so fitting another activity or informational program into the orientation schedule may be difficult. As was previously mentioned, the issue of personal rights makes enforcement of a tobacco-free policy difficult, since smoking is still a legal activity. Therefore, it will be important for whoever is enforcing this policy to keep this in mind; the policy should not be enforced with punitive measures like fines, but should instead strive for community-oriented enforcement, since it is supposed to promote positive health habits, not punish negative ones. Finally, due to the high percentage of students who reported on the KAPS that they believe the tobacco-free policy should be enforced “like other policies at Tufts,” administrators should refer to other Tufts policies, like the alcohol and drug policies, when drafting information related to policy enforcement for the Student Handbook.

Many schools that have already become smoke-free or tobacco-free, including Northeastern University, use online anonymous reporting systems as part of their smoke-free campus initiative. The Tobacco-Free Initiative spoke with members of the Northeastern Smoke-Free group about their enforcement process, and these individuals expressed their satisfaction with the anonymous reporting system method. There is a link on Northeastern’s smoke-free campus website that allows members of the community to anonymously report information about a smoking incident, including the location, time of day, smoker’s name, and additional information (“Smoke-Free Campus Northeastern University,” 2014). The researchers of this study recommend that Tufts Health Services create a similar anonymous reporting system to include on the Tufts Tobacco-Free Campus website. Survey results indicate that students do not

want the policy should be punitive, and therefore tools like an anonymous reporting system and written warnings could be useful in the enforcement of this policy.

Implications for Research and Policy

Future studies should aim to (1) assess smoking behaviors, perceptions of campus smoking norms attitudes about smoke-free policy change in a larger, multi-university comparison, (2) use multivariate analysis to expand the results found in this study and to reduce the likelihood of confounding variables, and (3) look at how these constructs change over time through a longitudinal study. Although each school is different and will require a uniquely tailored implementation and enforcement plan for the gradual rollout of a tobacco-free campus policy, studies on multiple schools could provide valuable, generalizable information for types of schools, such as “large, urban campus” or “small, liberal arts college” to use as a foundation for their plans. Although the questions created for this study provided useful information for the implementation and enforcement of a tobacco-free policy at Tufts University, it may be more useful in the future to utilize only tested, validated questions which can be used in multiple settings with different cohorts of people. As with the majority of studies relying on self-report data, this study had a small response rate- researchers in the future should work to increase study participation through methods that specifically target college students on a variety of platforms. For example, the present study saw a large increase response rates after the survey was posted on the class year Facebook pages. Posting on social media, sending emails, hanging paper flyers around campus, and targeting specific social groups on campus may be useful strategies when recruiting undergraduate students. Finally, data should be collected at Tufts University as well as other universities in the years following policy implementation. This will allow researchers to ensure that the gradual implementation is done in a way that suits the needs of the members of

the university community, as well as to evaluate the effectiveness of the policy in reducing cigarette smoking and in positively changing smoking norms on campus.

Conclusions

The current study evaluated smoking behaviors and attitudes surrounding the implementation and enforcement of a tobacco-free campus policy at Tufts University. Approximately 9% of KAPS respondents were current everyday or someday smokers, and 3% of respondents were current everyday smokers. The majority of students at Tufts University are in support of or neutral toward the implementation of a tobacco-free campus policy, and level of support at Tufts is similar to pre-existing literature. Many students perceived smoking prevalence on campus to be higher than it actually is, likely due to concentrated secondhand smoke exposure at high-traffic areas on the Tufts campus.

The investigators recommend that a “Tufts Tobacco-Free Campus” informational website be launched when the policy goes into effect, and that administrators keep in mind the marginalized groups that could potentially be disproportionately affected by this policy. Open-forums, an anonymous feedback system, and other opportunities to periodically obtain feedback from the Tufts community should be used throughout the first few years following policy implementation, and data should be collected annually for analysis. Tufts should offer cessation resources, especially stress-relieving activities and cessation counseling, and should heavily publicize these services so students are aware of them. Finally, enforcement of this policy should not involve the TUPD, as it is not meant to be punitive, and should instead focus on community-oriented enforcement through anonymous reporting and overall encouragement of positive health behaviors on campus.

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Tables

Table 1: Demographic Characteristics

Table 1: Demographic Characteristics of the study samples from the FYSES (2015) and the KAPS (2017)

Demographic Characteristics	FYSES (n=1422)		KAPS (n=1112)	
	n	(%)	n	(%)
Gender				
Female	619	(43.53)	593	(53.32)
Male	573	(40.29)	487	(43.79)
Other	5	(0.35)	32	(2.88)
Missing	225	(15.82)	0	(0)
Race				
Two or more races	n/a	n/a	106	(9.53)
Black/African American	70	(4.92)	23	(2.07)
Asian	246	(17.30)	152	(13.67)
Am. Indian/Alaska Nat.	8	(0.56)	3	(0.27)
Nat. Hawaiian/Pac. Islander	7	(0.49)	0	(0)
White	854	(60.06)	749	(67.36)
Missing	237	(16.67)	7	(0.63)
Ethnicity				
Hispanic	81	(5.70)	85	(7.64)
Year in School				
Freshman	578	(40.64)	280	(25.18)
Sophomore	645	(45.36)	287	(25.81)
Junior	n/a	n/a	253	(22.75)
Senior	n/a	n/a	292	(26.26)
Missing	199	(13.99)	0	(0)
Sexual Identity				
Heterosexual/Straight	1,006	(70.75)	834	(75)
Gay	40	(2.81)	56	(5.04)
Lesbian	5	(0.35)	10	(0.90)
Bisexual	61	(4.29)	69	(6.21)
Other	63	(4.43)	140	(12.59)
Missing	247	(17.37)	3	(0.27)

Table 2: Current Smoking Behaviors

Table 2: Current smoking behaviors at Tufts University, KAPS (2017) (n=1112)

Smoking Behaviors	Total n (%)
Cigarette Smoking Behavior	
Current everyday smokers	34 (3.06)
Current someday smokers	73 (6.56)
Current non-smokers	1005 (90.38)
Missing	0 (0)
E-Cigarette Smoking Behavior	
Current everyday smokers	11 (0.99)
Current someday smokers	55 (4.95)
Current non-smokers	1041 (93.62)
Missing	5 (0.45)

Table 3: Perceived Smoking Norms and Worry About Secondhand Smoke

Table 3: Perceived Smoking Norms and Worry About Secondhand Smoke at Tufts University, KAPS (2017) (n=1112)

Perceived Smoking Norms and Worry About Secondhand Smoke	Smokers* (n=107)			Non-smokers* (n=1005)		
	Total n (%)	n (%)	n (%)	Total n (%)	n (%)	n (%)
Peer tobacco use						
Seen someone smoking cigarettes in past 7 days	982 (88.30)	100 (93.46)	882 (87.76)	982 (88.30)	100 (93.46)	882 (87.76)
Been exposed to other people's tobacco smoke on campus in past 7 days	749 (67.35)	53 (49.53)	696 (69.25)	749 (67.35)	53 (49.53)	696 (69.25)
Thinks typical student uses cigarettes at least 10 out of 30 days	103 (9.26)	7 (6.54)	96 (9.55)	103 (9.26)	7 (6.54)	96 (9.55)
Perceives 10% of students or more regularly smoke cigarettes on campus	626 (56.29)	67 (62.61)	559 (55.62)	626 (56.29)	67 (62.61)	559 (55.62)
Worry about Secondhand Smoke Exposure						
Agree	460 (41.37%)	0 (0%)	460 (45.77)	460 (41.37%)	0 (0%)	460 (45.77)
Disagree	237 (21.31)	11 (10.28%)	226 (24.49)	237 (21.31)	11 (10.28%)	226 (24.49)
Neutral	142 (12.77)	3 (2.80%)	139 (13.83)	142 (12.77)	3 (2.80%)	139 (13.83)
Missing	273 (24.55)	93 (86.92)	180 (17.91)	273 (24.55)	93 (86.92)	180 (17.91)

* Differences by smoking status were not tested for significance by Chi-Squared analysis due to small cell sizes

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* Differences by smoking status were not tested for significance by Chi-Squared analysis due to small cell sizes

Table 4: Policy Support

Table 4: Support for tobacco-free policy at Tufts, KAPS (2017) (n=11112)

	Support for Tobacco-Free Policy		Support for Tufts becoming tobacco-free	
	Total n (%)	Smokers* (n=107) n (%)	Non-smokers* (n=1005) n (%)	
Strongly oppose	267 (24.01)	93 (86.92)	174 (17.31)	
Moderately oppose	166 (14.93)	12 (11.21)	154 (15.32)	
Neither support nor oppose	104 (9.35)	1 (0.93)	103 (10.25)	
Moderately support	200 (17.99)	1 (0.93)	199 (19.80)	
Strongly support	374 (33.63)	0 (0)	374 (37.21)	
Prefer not to answer	1 (0.09)	0 (0)	1 (0.10)	

* Differences by smoking status were not tested for significance by Chi-Squared analysis due to small cell sizes

Table 5: Benefits/Barriers to Implementation, Enforcement

Table 5. Benefits and Barriers to Implementation, Information about Cessation, and Enforcement Strategies, KAPS (2017) (n=1112)

Implementation and Enforcement	Smokers* (n=107)			Non-smokers* (n=1005)		
	Total n (%)	n (%)	n (%)	Total n (%)	n (%)	n (%)
Barriers and Benefits to Implementation						
"Regulation of smoking in public places is a good thing"						
Agree	715 (64.30%)	7 (6.54%)	708 (70.45%)			
Disagree	50 (4.50%)	4 (3.74%)	46 (4.58%)			
Neutral	75(6.74%)	3 (2.80%)	72 (7.16%)			
"Smoking among students is acceptable"						
Agree	267 (24.01%)	12 (11.21%)	255 (25.37%)			
Disagree	314 (28.24%)	0 (0%)	314 (31.24%)			
Neutral	255 (22.93%)	2 (1.87%)	253 (25.17%)			
"Most people on Tufts campus believe students should be allowed to smoke"						
Agree	318 (28.60%)	8 (7.48%)	310 (30.85%)			
Disagree	174 (15.65%)	2 (1.87%)	172 (17.11%)			
Neutral	327 (29.41%)	4 (3.74%)	323 (32.14%)			
"Most people believe students who smoke should quit"						
Agree	626 (56.29%)	10 (9.35%)	616 (61.29%)			
Disagree	55 (4.95%)	2 (1.87%)	53 (5.27%)			
Neutral	145 (13.04%)	1 (0.93%)	144 (14.33%)			
"I would be less likely to smoke on campus if Tufts had a tobacco-free policy"						
Agree	168 (15.11%)	3 (2.80%)	165 (16.42%)			
Disagree	133 (11.96%)	9 (8.41%)	124 (12.34%)			
Neutral	85 (7.64%)	2 (1.87%)	83 (8.26%)			
"Regulation of smoking in outdoor places is a good thing"						
Agree	629 (56.56%)	3 (2.80%)	626 (62.29%)			
Disagree	61 (5.48%)	3 (2.80%)	58 (5.77%)			
Neutral	149 (13.40%)	8 (7.48%)	141 (14.03%)			
	58					

Implementation and Enforcement		Smokers* (n=107)		Non-smokers* (n=1005)	
		Total (n (%))	n (%)	n (%)	n (%)
Cessation Resources					
Would take advantage of NRT products					
Would take advantage of prescription medications		29 (27.10%)	29 (27.10%)	n/a	n/a
Would take advantage of "Quit Kits"		30 (28.04%)	30 (28.04%)	n/a	n/a
Would take advantage of cessation counseling or support groups		14 (13.08%)	14 (13.08%)	n/a	n/a
Would take advantage of stress-relieving activities		7 (6.54%)	7 (6.54%)	n/a	n/a
		49 (45.79%)	49 (45.79%)	n/a	n/a
Does Tufts Health Services offer Cessation Resources?					
Yes					
		160 (14.39%)	18 (16.82%)	142 (14.13%)	
No					
		47 (4.23%)	12 (11.21%)	35 (3.48%)	
Unsure					
		898 (80.76%)	76 (71.03%)	822 (81.80%)	
Enforcement Strategies					
Believe policy should be enforced like other policies at Tufts					
		488 (43.88%)	1 (0.93%)	487 (48.45%)	
Believe punitive measures (probation, fines) should be used for enforcement					
		312 (28.06%)	0 (0%)	312 (31.04%)	
Believe written warnings should be used in enforcement					
		482 (43.35%)	6 (5.61%)	476 (47.36%)	
Believe anonymous reporting should be used for enforcement					
		238 (21.40)	1 (0.93%)	237 (23.58%)	
Believe discussions with staff about violations should be used in enforcement					
		421 (37.86%)	2 (1.87%)	419 (41.69%)	
Responsibility for enforcement at Tufts					
Tufts University Police Department					
		496 (44.60%)	5 (4.67%)	491 (48.86%)	
Office of Residential Life and Learning					
		473 (42.54%)	5 (4.67%)	468 (46.56%)	
Office of Student Affairs, Judicial Affairs					
		347 (31.20%)	1 (0.93%)	346 (34.43%)	
Tufts Community members, bystanders					
		299 (26.89%)	4 (3.74%)	295 (29.35%)	

* Differences by smoking status were not tested for significance by Chi-Squared analysis due to small cell sizes

Table 3: Perceived Smoking Norms and Worry About Secondhand Smoke

Table 3: Perceived Smoking Norms and Worry About Secondhand Smoke at Tufts University, KAPS (2017) (n=1112)

Perceived Smoking Norms and Worry About Secondhand Smoke	Smokers* (n=107)			Non-smokers* (n=1005)		
	Total n (%)	n (%)	n (%)	Total n (%)	n (%)	n (%)
Peer tobacco use						
Seen someone smoking cigarettes in past 7 days	982 (88.30)	100 (93.46)	882 (87.76)	982 (88.30)	100 (93.46)	882 (87.76)
Been exposed to other people's tobacco smoke on campus in past 7 days	749 (67.35)	53 (49.53)	696 (69.25)	749 (67.35)	53 (49.53)	696 (69.25)
Thinks typical student uses cigarettes at least 10 out of 30 days	103 (9.26)	7 (6.54)	96 (9.55)	103 (9.26)	7 (6.54)	96 (9.55)
Perceives 10% of students or more regularly smoke cigarettes on campus	626 (56.29)	67 (62.61)	559 (55.62)	626 (56.29)	67 (62.61)	559 (55.62)
Worry about Secondhand Smoke Exposure						
Agree	460 (41.37%)	0 (0%)	460 (45.77)	460 (41.37%)	0 (0%)	460 (45.77)
Disagree	237 (21.31)	11 (10.28%)	226 (24.49)	237 (21.31)	11 (10.28%)	226 (24.49)
Neutral	142 (12.77)	3 (2.80%)	139 (13.83)	142 (12.77)	3 (2.80%)	139 (13.83)
Missing	273 (24.55)	93 (86.92)	180 (17.91)	273 (24.55)	93 (86.92)	180 (17.91)

* Differences by smoking status were not tested for significance by Chi-Squared analysis due to small cell sizes

Appendix

Appendix 1: ACHA Position Statement on Tobacco on College and University Campuses

NOVEMBER 2011

ACHA Guidelines

Position Statement on Tobacco on College and University Campuses

The American College Health Association (ACHA) acknowledges and supports the findings of the Surgeon General that tobacco use in any form, active and/or passive, is a significant health hazard. ACHA further recognizes that environmental tobacco smoke has been classified as a Class-A carcinogen and that there is no safe level of exposure to environmental tobacco smoke (ETS), a recognized toxic air contaminant. In light of these health risks, ACHA has adopted a NO TOBACCO USE policy and encourages colleges and universities to be diligent in their efforts to achieve a 100% indoor and outdoor campus-wide tobacco-free environment. *This position statement reflects the viewpoint of ACHA and serves only as a guide** to assist colleges and universities with evaluating progress toward becoming or maintaining tobacco-free living and learning environments that support the achievement of personal and academic goals.

ACHA joins with other professional health associations in promoting tobacco-free environments. According to the ACHA-National College Health Assessment (ACHA-NCHA) conducted in spring 2011, 85% of college students described themselves as non-smokers (never smoked or have not smoked cigarettes in the last 30 days); 92% reported being non-smokers for hookah/water pipes (never used or have not used in the last 30 days); and 96% described themselves as non-users of smokeless tobacco (never used or have not used in the last 30 days). ACHA supports the health goals of the U.S. Department of Health and Human Services' Healthy People 2020 initiative to reduce the proportion of adults who smoke to below 12% by the year 2020 and to positively influence America's college students to help them remain

* Compliance with the elements of this position statement is not and cannot be mandated by ACHA; nor is compliance a condition for institutional membership in ACHA.

or become tobacco-free. Additionally, ACHA actively supports the Healthy Campus 2020 goals to reduce cigarette use (within the last 30 days) by college students to below 14% and smokeless tobacco use (within the last 30 days) to below 3% by the year 2020.

Efforts to promote tobacco-free environments have led to substantial reductions in the number of people who smoke, the amount of tobacco products consumed, and the number of people exposed to environmental tobacco hazards. ACHA acknowledges that achieving a tobacco-free environment requires strong leadership and support from all members of the college/university community. Because the improvements to health can be so significant, ACHA recommends the following positions be taken to address policy, prevention, and cessation as it pertains to tobacco issues:

1. Develop a strongly worded tobacco policy that reflects the best practices in tobacco prevention, cessation, and control. These include the following recommendations:
 - a. Tobacco is defined as all tobacco-derived or containing products, including, but not limited to, cigarettes (clove, bidis, kreteks), electronic cigarettes, cigars and cigarillos, hookah-smoked products, and oral tobacco (spit and spitless, smokeless, chew, snuff).
 - b. Tobacco use is prohibited on all college and university grounds, college/university owned or leased properties, and in campus-owned, leased, or rented vehicles.
 - c. All tobacco industry promotions, advertising, marketing, and distribution are prohibited on campus properties.
 - d. The sale of tobacco products and tobacco-related merchandise (including logo

- containing items) is prohibited on all university property and at university-sponsored events, regardless of the operating vendor.
- e. The distribution or sampling of tobacco and associated products is prohibited on all university owned or leased property and at university-sponsored events, regardless of the venue.
 - f. Tobacco industry and related company sponsorship of athletic events and athletes is prohibited.
 - g. The college/university does not permit tobacco companies on campus to conduct student recruitment or employment activities.
 - h. The college/university does not accept any direct or indirect funding from tobacco companies.
 - i. The campus provides and/or promotes cessation services/resources for all members of the college/university community.
2. Inform all members of the campus community by widely distributing the campus tobacco policy on an annual basis. The tobacco policy is clearly posted in employee and student handbooks, on the college/university website, and in other relevant publications. Key components of the policy are also shared with parents, alumni/ae, and visitors. The general policy should be included in prospective student materials in both printed and electronic formats.
 3. Offer and promote prevention and education initiatives that actively support non-use and address the risks of all forms of tobacco use.
 4. Offer and promote programs and services that include practical, evidence- and theory-informed approaches to end tobacco use, including screenings through health and counseling services, free/reduced-cost tobacco-cessation counseling, free/reduced-cost nicotine replacement therapy, and medication options on campus.
 5. Advocate for requiring the inclusion of tobacco use cessation products, medications, and services in student health insurance plans.
6. Provide a comprehensive marketing and signage effort to ensure that all college/university visitors, vendors, guests, and others arriving on property owned or leased by the institution are aware of the tobacco-free policy.
 7. Plan, maintain, and support effective and timely implementation, administration, and consistent enforcement of all college/university tobacco-related policies, rules, regulations, and practices. Provide a well-publicized reporting system for violations.
 8. Collaborate with local, state, and national public health entities and tobacco prevention and control public, private, and national non-profit tobacco-related organizations in support of maintaining a healthy tobacco-free environment.
 9. Develop and maintain a tobacco task force on campus to identify and address needs and concerns related to tobacco policy, compliance, enforcement, and cessation. Key individuals and departments to invite/include:
 - a. Undergraduate and graduate students (particularly from student-elected/representative organizations)
 - b. Health and counseling center professionals
 - c. Faculty (including faculty senate or other faculty governing bodies)
 - d. Residence life/housing
 - e. Judicial affairs
 - f. Campus safety/police
 - g. Human resources
 - h. Neighborhood liaisons
 - i. Facilities
 - j. Other important stakeholders specific to your campus



1362 Mellon Road, Suite 180 | Hanover, MD 21076
(410) 859-1500 | www.acha.org

Appendix 2: IRB Expedited Approval for Study # 1703001



Office of the Vice Provost
for Research

March 6, 2017 | Notice of Action

IRB Study # 1703001 | Status: ACTIVE

ATTENTION: BEFORE CONDUCTING ANY RESEARCH, PLEASE READ THE ENTIRETY OF THIS NOTICE AS IT CONTAINS IMPORTANT INFORMATION ABOUT PROPER STUDY PROCEDURES.

Title: An Evaluation of College Student Attitudes Toward the Implementation and Enforcement of a Tobacco-Free Campus Policy at Tufts University - Updated Review

PI: Megan D'Andrea
Faculty Advisor: Allen, Jennifer

The PI is responsible for all information contained in both this notice of action and on the following **Investigator Responsibilities Sheet**.

Only copies of approved stamped consent forms and other study materials may be utilized when conducting your study.

This research protocol now meets the requirements set forth by the Office for Human Research Protections in 45 CFR 46 under Expedited .

Reviewed 3/2/2017 – Expires 3/1/2018

- Approved for 5400 participants for the duration of the study.

Protocol Management:

- All translated study documents must be submitted for review, approval, and stamping prior to use.
- For all changes to the protocol, submit: *Request for Protocol Modification* form
- All Adverse Events and Unanticipated Problems must be reported to the Office of the IRB promptly (no later than 7 calendar days after first awareness of the problem) using the appropriate forms.
- Six weeks prior to the expiration of the protocol on 3/1/2018, investigators must submit either a *Request for Continuing Review* or a *Request for Study Closure*
- All forms can be found at: <http://www.tufts.edu/central/research/IRB/Forms.htm>

IRB Administrative Representative Initials: _____

Handwritten initials in blue ink, appearing to be "ASB", written over a horizontal line.

Social, Behavioral, and Educational Research • Institutional Review Board • FWA00002063
20 Professors Row, Medford, MA 02155 • T: 617.636.3417 • F: 617.636.3673 • E: SBER@tufts.edu

Appendix 3: KAPS Recruitment Materials

Appendix 3a: Initial Recruitment Email

Initial Recruitment Email

This email will be sent to all Tufts students, inviting them to fill out the survey.

Dear [student name],

Big changes are being made in tobacco policy across Boston. What are your thoughts on how these changes could apply to Tufts? I am writing to invite you to take a brief survey evaluating student knowledge, attitudes, and beliefs regarding smoking behaviors at Tufts.

This research study is voluntary. If you decide to take part, you will fill out a brief online survey through Qualtrics. The survey will ask for your thoughts about smoking behaviors on the Tufts campus and for your demographic information.

This survey will take approximately 10 minutes, and can be stopped at any point. At the end of the survey, you may also choose to enter your name for the chance to win a \$50 Amazon gift card.

The survey can be found here:

[link to survey]

We hope you will take some time to consider participating in this important study. If you have any questions, feel free to email Megan D'Andrea at megan.d_andrea@tufts.edu.

Sincerely,

Megan D'Andrea
Study Investigator

Jennifer Allen
Thesis Advisor

Appendix 3b: Follow-Up Recruitment Email

Second (Reminder) Recruitment Email

This email will be sent to those who have not completed the survey two weeks after the first email is sent.

Dear [student name],

Remember the survey we sent to you to learn about your opinions on tobacco use on campus? If you haven't already done so, you have another chance to participate! The survey can be found here:

[link to survey]

After completing the survey, you will be able to enter your name for the chance to win a \$50 Amazon gift card.

We hope you will take some time to consider participating in this study. If you have any questions, feel free to email Megan D'Andrea at megan.d_andrea@tufts.edu.

Sincerely,

Megan D'Andrea
Study Investigator

Jennifer Allen
Thesis Advisor

Appendix 3c: Recruitment Facebook Post

Facebook Post for Tufts Class Pages

This message will be posted in the Tufts Class of 2017, 2018, 2019, and 2020 Facebook pages one week after the initial recruitment email is sent to students.

Hey, Class of (*insert class year*)! Want to participate in a study about smoking on the Tufts Medford/Somerville campus? If so, please take this brief survey about student knowledge, attitudes, and beliefs regarding smoking behaviors at Tufts. Participants will be entered for a chance to win a \$50 Amazon gift card. Please contact me at megan.d_andrea@tufts.edu if you have any questions. Thanks!

Appendix 4: KAPS Survey

Tobacco Policy Knowledge, Attitudes, and Prevention Survey

These survey questions will be organized into an online survey through Qualtrics.

Smoking behaviors

1. Have you smoked at least 100 cigarettes in your entire life?
 - a. Yes
 - b. No
 - c. Don't know/not sure
 - d. Prefer not to answer
2. Do you currently smoke cigarettes every day, some days, or not at all?
 - a. Every day
 - b. Some days
 - c. Not at all
 - d. Don't know/not sure
 - e. Prefer not to answer
3. During the past 12 months, have you stopped smoking for one day or longer because you were trying to quit smoking?
 - a. Yes
 - b. No
 - c. Don't know/not sure
 - d. Prefer not to answer
4. How long has it been since you last smoked a cigarette, even one or two puffs?
 - a. Within the past month (less than 1 month ago)
 - b. Within the past 3 months (1 month but less than 3 months ago)
 - c. Within the past 6 months (3 months but less than 6 months ago)
 - d. Within the past year (6 months but less than 1 year ago)
 - e. Within the past 5 years (1 year but less than 5 years ago)
 - f. Within the past 10 years (5 years but less than 10 years ago)
 - g. 10 years or more
 - h. Never smoked regularly
 - i. Don't know/not sure
 - j. Prefer not to answer
5. Have you ever used an e-cigarette or other "vaping" product, even one time, in your entire life?
 - a. Yes
 - b. No
 - c. Don't know/not sure
 - d. Prefer not to answer
6. Do you now use e-cigarettes or other electronic "vaping" products every day, some days, or not at all?
 - a. Every day
 - b. Some days
 - c. Not at all
 - d. Don't know/not sure

- e. Prefer not to answer
7. During the past 30 days, on how many days did you use marijuana or hashish?
- a. Never used
 - b. Have used, but not in the last 30 days
 - c. 1-2 days
 - d. 3-5 days
 - e. 6-9 days
 - f. 10-19 days
 - g. 20-29 days
 - h. Used daily
 - i. Don't know/not sure
 - j. Prefer not to answer
8. Where do you purchase cigarettes?
- a. Convenience stores
 - b. Grocery stores
 - c. Gas stations
 - d. Drug stores
 - e. Smoke Shops
 - f. Other, please specify:
9. In the past 7 days, have you seen someone smoking cigarettes on campus?
- a. Yes
 - b. No
 - c. Prefer not to answer
10. In the past 7 days have you been exposed to other people's tobacco smoke on campus?
- d. Yes
 - e. No
 - f. Prefer not to answer
11. Within the last 30 days, how often do you think the typical student at your school used cigarettes?
- g. Never used
 - h. Have used but not in the last 30 days
 - i. 1-2 days
 - j. 3-5 days
 - k. 6-9 days
 - l. 10-19 days
 - m. 20-29 days
 - n. Used daily
 - o. Don't know/not sure
 - p. Prefer not to answer
12. How many students do you think regularly smoke cigarettes on campus?
- q. Nearly all
 - r. Many
 - s. Some
 - t. Few

- u. Very few
 - v. Don't know/not sure
 - w. Prefer not to answer
13. Please indicate your level of support for the Tufts Medford/Somerville campus becoming a "tobacco-free" campus:
- a. strongly support
 - b. moderately support
 - c. neither support nor oppose
 - d. moderately oppose
 - e. strongly oppose
 - f. Prefer not to answer
14. Do you think that the policy should be enforced like other campus policies are enforced at Tufts?
- g. Yes
 - h. No
 - i. Prefer not to answer
15. Which of the following strategies do you think should be employed in the enforcement of this policy? Select all that apply:
- j. Punitive measures, such as probation or fines
 - k. Written warnings
 - l. Discussions with staff about smoking violations
 - m. Other, please specify:
16. Who do you think would be responsible for enforcing a Tobacco-Free Policy on the Tufts campus? Select all that apply:
- n. Tufts University Police Department
 - o. Office of Residential Life and Learning
 - p. Office of Student Affairs, Judicial Affairs
 - q. Tufts Community members/bystanders
 - r. Other, please specify:
17. To what extent do you agree with the following statements:
- Regulation of smoking in *public* places is a good thing
- Smoking among students is acceptable
- I worry about being exposed to secondhand smoke on the Tufts campus
- Most people on this campus believe students should be allowed to smoke
- Most people believe students who smoke should quit
- I am less likely to smoke on campus because of my school's tobacco policy.
- Regulation of smoking in *outdoor* places is a good thing
- a. Strongly agree
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree

18. Would a tobacco-free campus policy at Tufts affect you positively, negatively, or not at all?
- f. Positively
 - g. Negatively
 - h. Not at all
 - i. Prefer not to answer
19. Does Tufts offer tobacco cessation services for students?
- j. Yes
 - k. No
 - l. I don't know
 - m. Prefer not to answer
20. Which of the following cessations would you take advantage of if they were readily available to you? Select all that apply:
- n. Nicotine Replacement Therapy, including packages, lozenges, and gum
 - o. Prescription medications, such as Bupropion, Varenicline, and Nortriptyline
 - p. "Quit kits" with stress balls, cinnamon products, quit line information, etc.
 - q. Cessation counseling or support groups
 - r. Stress relieving activities, such as massages, meditation, etc.
 - s. Other, please specify:
 - t. Not applicable, I do not smoke cigarettes

Demographic Information

1. What is your age?
2. What is your class year?
 - a. 2017, 2018, 2019, 2020
3. What is your gender identity?
 - a. Woman
 - b. Man
 - c. Genderqueer/Gender nonconforming
 - d. An identity not listed here, please specify:
 - e. I prefer not to answer
4. Which term best describes your sexual identity?
 - a. Asexual
 - b. Bisexual
 - c. Gay
 - d. Heterosexual/straight
 - e. Lesbian
 - f. Pansexual
 - g. Queer
 - h. Questioning/unsure
 - i. Another identity not listed here, please specify:
 - j. I prefer not to answer
5. Do you identify as transgender?
 - a. Yes

- b. No
- c. I prefer not to answer
- 6. How do you identify yourself? Check all that apply.
 - a. American Indian or Alaska Native
 - b. Asian
 - c. Black or African American
 - d. Hispanic/Latino
 - e. Native Hawaiian or Other Pacific Islander
 - f. White
 - g. Other, please specify:

Appendix 5: Tufts Tobacco-Free Policy

Subject: Tobacco-Free Environment Policy	Original Date: Goal: August 1, 2016
Departments: Human Resources	Revised Date:
Keywords: smoking, tobacco, tobacco-free	Pages: 2

I. PURPOSE:

Tufts University is committed to providing a safe and healthy learning and working environment for students, faculty, staff, and visitors and to serve as a role model of health promotion in the community. Evidence exists that exposure to tobacco causes illness to active and passive smokers. This policy reflects our commitment to reduce tobacco-related disease. This decision is reinforced by the consensus of medical research, the Massachusetts Commission of Public Health and the Surgeon General of the United States.

II. ELIGIBILITY:

This policy applies to all persons, including all students, faculty, staff, volunteers, vendors, and visitors, anywhere on University property and in buildings and facilities on the Boston and Medford campuses.

III. POLICY:

Smoking and tobacco product use, including electronic cigarettes, is prohibited on Tufts University property, owned, leased, and occupied. This includes buildings and grounds (building entryways, campus walkways, parking garages, and lots), and university owned and leased vehicles.

IV. DEFINITIONS

- A. “Electronic Smoking Device” means any product containing or delivering nicotine intended for human consumption that can be used by a person to simulate smoking through inhalation of vapor or aerosol from the product. The term includes any such device, whether manufactured, distributed, marketed, or sold as an e-cigarette, e-cigar, e-pipe, e-hookah, or vape pen, or under any other product name or descriptor.
- B. “Hookah” means a water pipe and any associated products and devices that are used to produce fumes, smoke, and/or vapor from the burning of material including, but not limited to, tobacco.
- C. “Smoking” means inhaling, exhaling, burning, or carrying any lighted or heated cigar, cigarette, or pipe, or any other lighted or heated tobacco intended for inhalation, including hookahs, whether natural or synthetic, in any manner or in any form. “Smoking” also includes the use of an electronic smoking device that creates an aerosol or vapor, in any manner or in any form, or the use of any oral smoking device for the purpose of circumventing the prohibition of smoking in this Article.
- D. “Tobacco Product” means any substance containing tobacco leaf, including but not limited to, cigarettes, cigars, pipe tobacco, hookah tobacco, snuff, chewing tobacco,

dipping tobacco, bidis, blunts, clove cigarettes, or any other preparation of tobacco; and any product or formulation of matter containing biologically active amounts of nicotine that is manufactured, sold, offered for sale, or otherwise distributed with the expectation that the product or matter will be introduced into the human body by inhalation; but does not include any cessation product specifically approved by the U.S. Food and Drug Administration for use in treating nicotine or tobacco dependence.

V. ADDITIONAL INFORMATION:

It is the responsibility of all members of the community to comply with this policy. Tufts University believes that the spirit of an inclusive and collaborative environment is adequate to resolve any disputes that might arise under this policy. It is expected that tobacco users and non-tobacco users will cooperate with mutual respect and understanding. All members of the University community are encouraged to uphold compliance with this policy by reminding students, faculty, staff, volunteers, vendors, and visitors of the ban of tobacco use at Tufts University, as necessary.

All members of the community are expected to be respectful of our neighbors and of community property and grounds adjacent to our properties. The university will not provide places for tobacco users to congregate.

Students, faculty, and staff will be provided with support materials about the health and safety concerns related to tobacco use, as well as resources to aid in tobacco cessation.

Violations by faculty or staff may be reported to the individual's supervisor and, if needed, steps may be taken consistent with other policies. Violations by students may be reported to the Office of the Dean of Student Affairs.

Appropriate signage will be placed throughout Tufts University indicating the prohibition of tobacco use.

VI. RESOURCES:

Tufts Support Services | 617-627-7000 | tss.tufts.edu

Office of the Dean of Student Services | 617-627-3758 | deanofstudentaffairs@ase.tufts.edu

Office of Environmental Health and Safety | 617-627-6911

Office of Health Promotion and Prevention | 617-627-3351 | healthpromotion@tufts.edu

Healthy Tufts Program | 617-627-0704 | HealthyTufts@tufts.edu

Tufts Health and wellness | 617-627-3350 |

Appendix 6: Tufts Daily Article about Tobacco-Free Initiative (2/21/17)

Student initiative looks to make Tufts a tobacco-free campus

tuftsdaily.com/news/2017/02/21/student-initiative-looks-to-make-tufts-a-tobacco-free-campus/

Emma Steiner

2/21/2017

Members of Tufts Tobacco Free, a student initiative four years in the making that seeks to eliminate smoking on the Medford/Somerville campus, are beginning to take the next steps to implement their proposed policy by seeking feedback from the student body. According to organizers, the policy would be rolled out over the course of several years.

The group met with Tufts Community Union (TCU) Senate last week to get its input on how to best implement the policy, according to senior Megan D'Andrea, a member of Tufts Tobacco Free. At that meeting, a number of senators raised concerns that the policy could end up unfairly targeting certain groups within the Tufts community.

"The overall goal of the policy is not to target individual smokers or to reduce individual smoking, it is more to promote overall health for this campus," D'Andrea said. "As a research institution that supports healthy living, we do not want this campus to support smoking, and so it just makes sense to have an overall tobacco-free campus in which this behavior is not approved of."

D'Andrea said that the policy would not take effect for another several years and that the contribution of the Tufts community is crucial to its full development.

"This policy is aimed to promote overall health on campus," she said. "We are hoping to do so in the long-term future. That being said, a major policy change does affect everyone on campus and so, because of that, we want to be sensitive to that and make sure that the policy is ready to be rolled out over a few years and make sure that it's a gradual shift and not an overnight shift to a completely tobacco-free campus."

Jennifer Allen, chair of the Department of Community Health and associate professor of public health and community medicine, said that the policy also aims to prevent those who smoke casually from picking up a more serious habit.

"In this college-age population, a lot of health behaviors are established," Allen said. "Patterns get started, and especially with tobacco which is highly addictive, it becomes a pattern that tracks into later adulthood."

Allen says that the tobacco product ban is actually one of the smaller parts of the policy. It would also provide smoking-cessation resources to all Tufts students free of charge and educational resources about the effects of smoking, according to Allen.

However, the policy raised numerous concerns within TCU Senate and among the student body.

Senator Sylvia Ofoma said she understood the concerns about personal health, but she expressed reservations about how such a policy might disproportionately affect different marginalized groups of students on campus.

"Whenever you have a drug policy, they tend to hurt marginalized groups the most," Ofoma, a senior, said. "There have been studies shown that microaggressions and discrimination tend to drive usage of drugs ... we're really concerned about how it's going to affect students."

Senator Ben Kessler was also concerned that the policy may affect specific students and university staff members, particularly LGBTQ and low-income people, in other negative ways.

"What a tobacco-free campus does is that it pushes people further off campus," Kessler, a junior, said. "A good example is that queer people are more likely to smoke, so what that means is that we're pushing queer people further off this campus who might already feel like this campus isn't for them. Low-income students are more likely to smoke too ... I'm concerned about what it means for workers on this campus who smoke."

Senior Lauren Samuel worried that the policy is an imposition on students who have different value systems and that rules and constraints would not give students the type of care that Tufts Tobacco Free looks to promote.

"Bans are just peculiar to me as a way of looking out for the community, because to me it doesn't seem like a 'looking out' kind of thing," Samuel said.

D'Andrea addressed some of those concerns, saying that the group is aware of the disparity in smoking rates among different populations. She added that the group is looking to offer additional resources to help people quit smoking if they so choose.

"We are hoping to make sure that our policy is inclusive of all these groups and ... that we are not trying to force people to quit smoking if they don't want to," D'Andrea said. "If someone does not want to quit smoking, this policy does not affect their right to do so."

D'Andrea said that the policy's enforcement mechanism has not yet been set, but it would not seek to punish individual smokers.

"[The Tufts University Police Department] is not going to be enforcing this policy," she said. "We met with them, [and] we don't want them to feel like they have to be the tobacco enforcers."

Instead, educational resources would be made available and students could potentially report problems through an anonymous online form, D'Andrea said. She explained that the group has been working with Tufts Health Service to provide free cessation resources and tobacco use counseling for those who need it.

Director of Health Promotion and Prevention Ian Wong said the goal of the policy is to support and educate students.

"There are certain people who will need mental health counseling and things like that, but for a bigger majority, sometimes they just need to know how to deal with their stress," Wong said.

Allen also said that the group will be rolling out a student feedback survey next week in order to create a space for students to voice concerns and contribute to the formation of the tobacco policy.

According to Allen, this policy is part of a larger effort by the Tufts administration to promote student health on campus. Another administration effort includes changing the nutritional standards in the dining halls, she noted.

"We want to promote health, and the culture of health means education, but it also means changes at the institutional level," Allen said. "We don't want to change people and certainly do not want to marginalize or shame any group at all. That would be directly antithetical to our goal."