

Original article

## Waterpipe and Cigarette Smoking Among College Athletes in the United States

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### Abstract

**Purpose:** Tobacco use using a waterpipe is an emerging trend among college students. Although cigarette smoking is low among college athletes, waterpipe tobacco smoking may appeal to this population. The purpose of this study was to compare cigarette and waterpipe tobacco smoking in terms of their associations with organized sport participation.

**Methods:** In the spring of 2008, we conducted an online survey of 8,745 college students at eight institutions as part of the revised National College Health Assessment. We used multivariable regression models to assess the associations between tobacco use (cigarette and waterpipe) and organized sports participation.

**Results:** Participants reported participation in varsity (5.2%), club (11.9%), and intramural (24.9%) athletics. Varsity athletes and individuals who were not varsity athletes had similar rates of waterpipe tobacco smoking (27.6% vs. 29.5%,  $p = .41$ ). However, other types of athletes were more likely than their counterparts to have smoked waterpipe tobacco (35.1% vs. 28.7%,  $p < .001$  for club sports and 34.8% vs. 27.7%,  $p < .001$  for intramural sports). In fully-adjusted multivariable models, sports participants of any type had lower odds of having smoked cigarettes, whereas participants who played intramural sports (odds ratio = 1.15, 95% confidence interval = 1.03, 1.29) or club sports (odds ratio = 1.15, 95% confidence interval = 1.001, 1.33) had significantly higher odds of having smoked waterpipe tobacco.

**Conclusions:** College athletes are susceptible to waterpipe tobacco use. In fact, compared with their nonathletic counterparts, club sports participants and intramural sports participants generally had higher odds of waterpipe tobacco smoking. Allure for waterpipe tobacco smoking may exist even for individuals who are traditionally considered at low risk for tobacco use. © 2010 Society for Adolescent Medicine. All rights reserved.

### Keywords:

Athletes; Waterpipe; Hookah; Tobacco; Team sports; Club sports; Intramural sports; Varsity sports; Organized sports; College

Although tobacco use remains the leading cause of death and disease in the United States [1], cigarette use has declined substantially over the past 2 decades, with proportional

decreases in the college population [2–4]. However, tobacco smoking using a waterpipe (a.k.a., hookah, narghile, argile, or shisha-pipe) seems to be an emerging trend [5–9], especially among college students, who have an estimated lifetime prevalence of 20–40% [5–8].

Despite the increased prevalence of waterpipe tobacco smoking, available research indicates that waterpipe tobacco smoke contains large amounts of toxicants; for example, a single

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waterpipe session produces about 46 times the tar of a single cigarette [10–13]. Furthermore, a single waterpipe use episode can increase smokers' expired air carbon monoxide level five times as much as a single cigarette [14], and the blood nicotine levels of daily waterpipe users are similar to those of an individual who smokes 10 cigarettes per day [15]. These data are consistent with preliminary reports linking waterpipe tobacco smoking to cancer, cardiovascular disease, decreased pulmonary function, and nicotine dependence [16–19].

Compared with nonathletes, college athletes of various types are less prone to cigarette smoking; studies estimate that smoking is as much as 50% lower among athletes compared with nonathletes [20–24]. It has been further suggested that there may be an association between the intensity of athletic involvement and risk behavior. For example, one large study of students at 140 U.S. colleges showed that only 15% of male students who participated in athletics daily were current smokers, compared with 20% of those who were only somewhat involved and 26% of those who were not involved [21,24]. Thus, it seems that different types of athletic engagement (e.g., varsity, club, and intramural sports) carry various degrees of risk for cigarette smoking.

However, despite trends toward lower cigarette use among college athletes, waterpipe tobacco smoking seems to be garnering increasing appeal among mainstream college populations and attracting a constituency among youth who do not use other forms of tobacco. In fact, as many as 35–65% of waterpipe tobacco users do not use cigarettes [5–8]. This may be because of its esthetic appeal—including the sweet smell and taste of the flavored tobacco and the exotic nature of the ritual—and because of the belief that water somehow “filters” smoke, rendering it less harmful than cigarette smoking [5,7,8].

However, it is not currently known whether waterpipe tobacco smoking is common among U.S. college athletes, and whether its popularity is different among participants of different types of organized sports (e.g., varsity, club, and intramural sports). Determining which populations are at greatest risk may help us to develop effective, targeted interventions and policies to reduce the potential harm of waterpipe tobacco use among college students.

The purpose of this study was to compare cigarette and waterpipe tobacco smoking in terms of their associations with organized sport participation. We hypothesized that waterpipe tobacco smoking would be common among all athletes but especially club and intramural athletes. We further hypothesized that, whereas cigarette smoking would be inversely associated with sports participation, waterpipe tobacco smoking would have no significant association—positive or negative—with sports participation.

## Methods

### *Design, setting, and procedures*

The American College Health Association (ACHA) conducts an annual assessment of college students' health

called the National College Health Assessment (NCHA). The NCHA is a bi-annual, national data collection effort including more than 90,000 college students. The original data collection instrument has been under revision since 2006. An item measuring lifetime and 30-day waterpipe tobacco smoking, as well as frequency of use in the last 30 days, is included in the revised survey, which is called the NCHA II.

The first pilot test of the NCHA II was conducted in Spring 2008. A total of 113 institutions self-selected to participate in the original NCHA in Spring 2008. Eight of the larger institutions surveyed in February 2008 were recruited by ACHA to pilot test the NCHA II. Although specific school identities are not revealed to outside researchers, we are allowed to know and to report a summary of the demographic characteristics of the institutions. As a whole, the eight universities represented the South, Northeast, and Western regions of the United States, and they were roughly divided among the 5,000–9,999, 10,000–19,999, and 20,000+ size brackets. Two of the eight institutions were private and six were public; all of the schools were 4-year institutions, and none had religious affiliations.

At each of the eight campuses, the original NCHA sample was doubled so that both the original and revised versions of the survey could be administered. Each campus submitted a list of randomly selected students for surveying. The ACHA used each campus list to assign students randomly to receive the two versions of the survey. All students were contacted by e-mail and asked to complete the confidential survey online. Nonresponders were contacted twice with reminder messages. Each institution was required to obtain institutional review board approval before data collection.

### *Measures*

*Sociodemographic data.* We used student report of age, gender, race, and ethnicity as covariates.

*Waterpipe and cigarette tobacco smoking.* The waterpipe tobacco smoking item added to the NCHA II, which follows the pattern of all other substance use items on the survey instrument, asks: “Within the past 30 days, on how many days did you use tobacco from a water pipe (hookah)? The answer choices are: (a) never used; (b) have used, but not in the past 30 days; (c) 1–2 days; (d) 3–5 days; (e) 6–9 days; (f) 10–19 days; (g) 20–29 days; and (h) all 30 days.” We used these data to measure (1) waterpipe tobacco smoking in the past 30 days (choices c, d, e, f, g, or h), and (2) ever waterpipe tobacco smoking (choices b, c, d, e, f, g, or h). A similarly worded item assessed cigarette smoking (1) over the past 30 days, and (2) ever.

*Organized sports.* The NCHA II asked all students to self-report whether they had actively participated in (1) intramural sports, (2) club sports, and/or (3) varsity sports, each within the past 12 months. The instrument did not use more specific language to define each of these types of sports.

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