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Short Communication

Attitudes toward smokeless tobacco use at all public sports venues among U.S. adults, 2016°

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ABSTRACT

Policies prohibiting smokeless tobacco (SLT) use at sports venues have been enacted in California and nine U.S. cities. We measured opposition toward SLT use at all public sports venues and its correlates among U.S. adults. Data were from the 2016 SummerStyles, a web-based survey of U.S. adults aged ≥ 18 years (n = 4203). Weighted estimates of opposition ("strongly" or "somewhat") SLT use were computed overall and by selected characteristics. Multivariable Poisson regression analyses were performed to identify determinants of opposition toward SLT use overall and among current tobacco product users. Overall, 81.8% of U.S. adults opposed SLT use at all public sports venues. Opposition varied by tobacco product use status: 85.9%, 86.9% and 60.4% among never, former, and current tobacco product users, respectively. Among all adults, the likelihood of opposition was higher among females than males (Adjusted Prevalence Ratio [APR] = 1.05; 95%CI = 1.01-1.08) and increased with every 10-year increase in age (APR = 1.01; 95%CI = 1.00-1.02). Likelihood was lower among persons with a high school diploma (APR = 0.92; 95%CI = 0.88-0.96) than those with college degree or higher; persons widowed/divorced/separated (APR = 0.92; 95%CI = 0.87-0.97) than those married; and current tobacco product users (APR = 0.70; 95%CI = 0.65-0.76) than never users. Among current tobacco product users, likelihood was lower among persons living in the Midwest (APR = 0.81; 95%CI = 0.66-0.98) and South (APR = 0.78; 95%CI = 0.65-0.94) than the Northeast. Most U.S. adults, including three-fifths of current tobacco product users, oppose SLT use at all public sports venues. Complete tobacco-free policies for sports venues that prohibit all forms of tobacco product use can help reduce the social acceptability of SLT use.

1. Introduction

The use of smokeless tobacco (SLT) (chewing tobacco, snuff, or dip) in the United States has remained unchanged despite declines in cigarette smoking in the past two decades (Wang et al., 2016b). Internal tobacco industry documents from the early 1970s reveal numerous marketing strategies designed to instill strong acceptance of SLT use in organized sports, particularly baseball, hockey, and car racing (Truth Tobacco Industry Documents, 1972; Truth Tobacco Industry Documents, 1978). Some of these strategies included SLT advertising in sports magazines and TV, the design of smokeless initiation products marketed as suitable alternatives to cigarettes, promotional activities using free sampling to promote initiation, and endorsements by major sport figures. Despite prohibitions on brand-name sponsorship of sporting and other cultural events under the Family Smoking Prevention and Tobacco Control Act (Food and Drug Administration, 2010) and the Master Settlement Agreement (Public Health Law Center,

2017), smokeless tobacco manufacturers spent, in 2014, 1.18 million dollars in advertising and promoting SLT products in sports and sporting events (Federal Trade Commission, 2016).

SLT use is higher among athletes than U.S. adults overall. For example, while 2.5% of U.S. adults are current SLT users (4.8% of males, 0.3% of females) (Hu et al., 2016), about one-third (33%) of major league baseball players reported using smokeless tobacco in 2014 (New York Magazine, 2016). SLT use by athletes is of concern because of the potential for such behavior to serve as an unpaid advertisement, despite restrictions on direct brand marketing. This is especially important because of the influence that sports figures play as youth role models (Chaffee et al., 2017).

High SLT use also is noted among male college athletes; about 47.2% of baseball players, 40.0% of lacrosse players, and 23.8% of football players reported SLT use during 2013 (NCAA Research, 2014). A 2013 study of U.S. high school students found similar patterns of tobacco use among high school athletes; SLT use was higher among

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high school students participating in athletic activities (11.1% overall, 17.4% among males, 3.4% among females) compared to those not engaging in any athletic activity (5.9% overall, 10.6% among males, 2.3% among females) (Agaku et al., 2015). Factors that might influence SLT use among athletes include the perception that SLT use behavior is part of sports culture and the misperception that SLT use can enhance sports performance (Chaffee et al., 2017; NCAA Research, 2014).

Since youth are highly impressionable and adolescence marks a period of high susceptibility to tobacco use (U.S. Department of Health and Human Services, 2012), efforts to eliminate SLT use in sporting events could benefit public health by reducing the social acceptability of tobacco use. Several U.S. jurisdictions have enacted laws prohibiting tobacco product use, including SLT, at sports venues, including their professional baseball stadiums. These include Boston, Chicago, Milwaukee, New York, Los Angeles, San Francisco, Washington D.C., St. Louis, Tampa Bay, and the state of California (Campaign for Tobacco-Free Kids, 2017). These laws, which, in 2017, effectively cover 14 of the 30 Major League stadiums in the United States, are strongly supported by the public. Surveys conducted in San Francisco and Massachusetts during 2015–2016 showed that > 60% of voters supported policies prohibiting the use of all tobacco products at all baseball venues and other athletic fields (Campaign for Tobacco-Free Kids, 2015; Campaign for Tobacco-Free Kids, 2016).

Measuring public attitudes toward tobacco use issues is important given the role of the public in informing policy makers and helping to enforce tobacco-free policies. However, no study has assessed public attitudes toward SLT use at public sports venues. Therefore, this study measured opposition toward SLT use at all public sports venues and its correlates among U.S. adults.

2. Methods

2.1. Data source

Data were obtained from *Summer Styles*, a web-based, cross-sectional survey of U.S. adults aged 18 years or older conducted during June 24th to July 11th, 2016 by Porter Novelli. A total of 4203 adult participants were selected randomly from a pool of about 55,000 online panelists to be representative of U.S. adults (GfK's Knowledge Panel®). Panelists were randomly recruited using probability-based sampling by address to reach respondents regardless of whether or not they had landline phones or Internet access. Data were weighted to approximate U.S. Current Population Survey proportions. The overall response rate for the 2016 *Summer Styles* was 68%. This analysis was exempt from Institutional Review Board review because it was a secondary analysis of deidentified data.

2.2. Measures

2.2.1. Opposition toward SLT use at all public sports venues

Respondents were asked: "The use of smokeless tobacco also known as chewing tobacco, snuff, or dip, is common in several sports, including baseball, rodeo, and hockey. What is your opinion on the use of smokeless tobacco products at all public recreational facilities, including stadiums, parks, and school gymnasiums, by players, coaches, referees, and fans?" Response options were "strongly favor", "somewhat favor", "somewhat oppose", and "strongly oppose". Respondents who reported "somewhat oppose" or "strongly oppose" were classified as opposing the use of SLT at all public sports venues.

2.2.2. Tobacco product use

Respondents were asked: 1) "Have you ever tried any of the following products, even just one time?" and 2) "In the past 30 days, which of the following products have you used at least once?" Categorical response options for both questions were grouped into seven tobacco product types: cigarettes, cigars, smokeless tobacco products, electronic

nicotine delivery systems, loose tobacco products (i.e., pipe tobacco and roll-your-own tobacco), water pipes/hookahs, and other products not specified. Current tobacco product users were persons who reported using at least one of the seven tobacco products in the past 30 days. Former tobacco product users were persons who reported using at least one tobacco product type during their lifetime, but did not use any tobacco product in the past 30 days. Never tobacco product users were persons who reported never having used any of the seven tobacco product types during their lifetimes.

2.2.3. Sociodemographics

Assessed sociodemographic characteristics included: sex, age, race/ethnicity, marital status, presence of children aged < 18 years in household, education, annual household income, metropolitan area status, and U.S. region.

2.3. Analysis

Analyses were performed separately for all adults and current tobacco product users. Weighted estimates of opposition and 95% confidence intervals (CIs) were calculated overall and by sociodemographics. Chi-squared tests were used to examine differences within subgroups. Statistical significance was set at p < 0.05.

Multivariable Poisson regression analyses were used to calculate Adjusted Prevalence Ratios (APRs) for determinants of opposition ("somewhat" or "strongly" oppose) toward SLT use in public sport venues. Independent variables included all sociodemographics and tobacco product use status; the latter was included only in the models for all adults. Regression models were iteratively fitted for each independent variable, adjusting for age, sex, race/ethnicity, and tobacco product use as appropriate; the latter was adjusted only in the models for all adults. Analyses were performed using R, version 3.2.2.

3. Results

3.1. Respondent characteristics

The weighted distributions of respondent characteristics were comparable to the U.S. population (U.S. Census Bureau, 2017). 58.3% of respondents were married or living with a partner. Overall, 70.7% reported not having children aged < 18 years in household. By tobacco product use, 39.7% were never users, 42.5% were former users, and 17.8% were current users.

3.2. Opposition toward SLT use at all public sports venues: all adults

Among all adults, 81.8% (52.4% "strongly" and 29.4% "somewhat") opposed SLT use at all public sports venues (Table 1). Opposition was higher among women (84.5%) than men (78.9%). Opposition ranged from 79.0% among adults aged 18–24 years to 88.0% among those aged \geq 65 years. Opposition was lowest among those widowed/divorced/separated (76.2%) and highest among those married or living with a partner (83.3%). By education, opposition ranged 74.7% among adults < high school education to 86.2% among those with a college degree or higher. By income, opposition ranged 76.4% among adults with annual household income < \$20,000 to 83.7% among those with \$50,000–99,999. Finally, opposition was lowest among current tobacco product users (60.4%) and highest among former users (86.9%) (all p < 0.05). Significant differences were not observed by race/ethnicity, presence of children aged < 18 years, metro status, and U.S. Census region.

The adjusted likelihood of opposing SLT use at all public sports venues was higher among females than males (APR = 1.05; 95%CI = 1.01-1.08) and increased, on average, with every 10-year increase in age (APR = 1.01; 95%CI = 1.00-1.02). Likelihood was lower among: those widowed/divorced/separated persons

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