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Gender differences in tobacco use among U.S. Special Olympics athletes

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ABSTRACT

Background: The rise in women's tobacco use and subsequent health complications has generated an increase in gender-related tobacco use research. However, no research has examined gender's influence on tobacco use among people with intellectual and developmental disabilities (IDD).

Objective: To examine 1) tobacco use prevalence rates among men and women with IDD, and 2) correlates of tobacco use among men and women with IDD.

Methods: This study examined gender differences in tobacco use among a sample of 3587 adult U.S. Special Olympics athletes who participated in health screenings from 2007 to 2014. The athletes were aged 18–89 ($M = 32.86$); 55.8% were male. Prevalence rates were calculated for men and women, and logistic regression analyses were conducted to examine tobacco use's association with age, blood pressure, body mass index, family member tobacco use, and daily fruit and vegetable consumption for each gender.

Results: Women's tobacco use prevalence was 4.1%, and men's was 9.4%. The only variable significantly associated with women's tobacco use was family member use, while men's tobacco use was associated with age, systolic blood pressure, family member tobacco use, and fruit and vegetable consumption.

Conclusion: Results shed light on possible courses of action for reducing tobacco use among women and men with IDD. Further research is needed to develop effective prevention and intervention approaches appropriate for people with IDD.

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Background

Findings from the U.S. National Adult Tobacco Survey estimate that 26.2% of men and 15.4% of women use tobacco every day or some days.¹ Both in the United States and globally, men use tobacco at higher rates than women.^{2,3} However, while men's prevalence rates have leveled off, women's tobacco use rates are rising and are predicted to increase significantly by 2025.^{3–6} Along with women's increased use, their overall risk of death from tobacco use is increasing.⁶

Smoking greatly increases risk for diseases and health problems including coronary heart disease, stroke, cancer, cataracts, unhealthy teeth and gums, type 2 diabetes, lowered immune system,

lower bone density, emphysema, and chronic bronchitis.⁷ In addition, women who use tobacco experience gender-specific health risks such as osteoporosis, early menopause, and sexual and reproductive health problems.³ Evidence also suggests that women experience some smoking-related illnesses at higher rates than men, including chronic obstructive pulmonary disease (COPD), heart disease, cancer, and asthma.^{6,8} These findings align with U.S. reports that COPD prevalence among women has grown so significantly that now more women die of COPD than do men.⁹ Recent research also indicates that U.S. women who smoke have a 25% greater risk of coronary heart disease than do men who smoke, and they report poorer physical and emotional health than do men.^{8,10}

The rise in women's tobacco use and subsequent health complications has generated an increase in gender-related tobacco use research. Recent research has found that gender plays a role in both motivations for use and cessation. Women are more likely than men to use tobacco to reduce stress and depression, to manage weight, and to fit in socially.^{11,12} Women are more influenced to quit

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use due to pressure from family members, particularly children, and to improve appearance, while men are more motivated to quit because of medical advice or to improve fitness.¹² Biologically-based sex differences may also play a role in cessation efforts. Some studies have reported that women become addicted to nicotine more quickly than men and have more difficulty quitting use due to biological differences.^{4,12} Evidence also shows that men are more likely to have cessation success with nicotine replacements, while women are more likely to benefit from behavioral interventions.¹⁰

However, little research has considered the intersectionality of gender and other aspects of diversity with regard to tobacco use, such as disabilities.⁴ This gap should be addressed because subgroup populations that experience multiple types of social and economic oppression have increased vulnerability for tobacco use, experience tobacco-related health disparities, and lack access to cessation resources.^{11,13,14}

Tobacco use researchers have largely overlooked adults with intellectual and developmental disabilities (IDD). According to the U.S. Census Bureau, adults with IDD comprise roughly 1% of the non-institutionalized adult population.¹⁵ They are more likely than their non-disabled peers to live in poverty, be unemployed, and have low levels of education,^{16–18} all of which are known factors associated with tobacco use and difficulty in cessation.^{8,19–21} People with IDD also experience high rates of chronic health complications and diseases including arthritis, asthma, diabetes, high blood pressure, high cholesterol, stroke, and cardiovascular disease.^{22,23} They also have high rates of epilepsy, fractures, skin conditions, respiratory conditions, and high mortality rates due to bowel obstruction, pneumonia, and trauma.²⁴ Tobacco use by people with IDD may compound existing health problems.

Of the scant tobacco use research conducted with people who have IDD in the United States, researchers have found lower use rates (4%–8%) than among the general U.S. population.^{25–27} Most studies have also found that men with IDD are more likely to use tobacco than women with IDD,^{28–31} a finding consistent with gender differences in the general population.² Only one research study (n = 1097), conducted in the United Kingdom, considered gender differences in correlates of tobacco use. This study found that while adults with IDD who have asthma were significantly more likely to smoke than those without asthma, after controlling for gender, the relationship between smoking and asthma was only significant for men.²⁸ Having found no U.S. studies that examined gender and tobacco use among people with IDD, we investigated this subject using a U.S. sample. We first calculated tobacco use prevalence among men and women in the sample. Then we examined demographic, health, and personal variables to determine gender differences in tobacco use.

Methods

Data

Data were collected from Special Olympics athletes aged 18 years or older. Special Olympics International (SOI) is a non-profit organization that provides sports training and competition for children and adults with IDD.³² To be eligible to participate in SOI competitions, individuals must have a diagnosis of an intellectual disability, cognitive delays, or a related developmental disability.³³

As part of its mission, SOI provides its athletes free health screenings through a program called Healthy Athletes. During SOI state, national, and international events, athletes have the opportunity to visit the Healthy Athlete Village, where trained volunteers assess athlete health and provide health educational information to them. Since 1997 when the Healthy Athletes program began, more

than 1.6 million health exams in more than 130 countries have been conducted.³²

We examined U.S. data from the SOI Health Promotion database, the database of health indicators SOI collects during Healthy Athletes health screenings. Data used in this study were from 2007 to 2014. Volunteers assessed athletes' height, weight, and blood pressure. Athletes self-reported other data collected. The SOI research office de-identified data before providing it to researchers. SOI also removed duplicates by selecting at random a single year of data for each athlete who participated in more than one year.

Measures

Although variables in the dataset relevant for studying tobacco use are limited, we extracted several demographic, health, and personal variables for examination.

Demographic characteristics were age in years and gender (coded as male [0] or female [1]).

Health indicators were systolic blood pressure (SBP), diastolic blood pressure (DBP), and body mass index (BMI; calculated as weight in kilograms divided by squared height in meters).

Personal variables included family member tobacco use, coded as no (0) or yes (1) based on the question "Does someone in your family smoke or chew tobacco?"

Fruit and vegetable consumption was coded based on the question "How often do you eat fruits and vegetables (less than daily [weekly, less than 1 serving per day, or never = 0], or daily (more than 5 servings per day, 3–5 servings per day, or 1–2 servings per day = 1))."

Tobacco use was coded as no (0) or yes (1) based on the question "Do you use tobacco?"

Analysis

The data were cleaned to remove data errors and assess for extreme outliers. Outliers were identified as a score three times the interquartile range of the distribution of scores in the sample.³⁴ The SOI dataset contained information on 13,815 U.S. Special Olympics athletes, aged 18 and older, who reported whether or not they use tobacco; 13,714 of whom also reported on gender. Athletes with incomplete data on other study variables were excluded from analysis, leaving a subset of 3587 cases used in the study. Continuous variables were examined for assumptions of parametric testing, and variables with non-linear logits were transformed accordingly. Tobacco use prevalence rates were calculated, and bivariate analyses were conducted to examine gender differences in study variables. In addition to describing the sample using percents and means, chi-square tests were used to examine gender differences in tobacco use, family members' tobacco use, and daily fruit and vegetable consumption. Independent samples t-tests were used to examine gender differences in age, BMI, and blood pressure. Separate logistic regression analyses were then conducted for men and women to determine odds ratios, i.e., the likelihood that study variables were related to each gender's tobacco use. Sensitivity analyses ensured that year in which data was collected was not associated with dependent variables.

Results

Prevalence

Of the 13,714 Special Olympics athletes who reported on tobacco use and gender, tobacco use prevalence was 3.8% among women and 8.1% among men.

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