JOURNAL OF
ADOLESCENT
HEALTH

Original article

Youth or Young Adults: Which Group Is at Highest Risk for Tobacco Use Onset?

Cheryl L. Perry, Ph.D.[a,*], Adriana Pérez, Ph.D.[b], Meagan Bluestein, M.P.H.[c], Nicholas Garza, M.P.H.[c], Udoka Obinwa, M.P.H.[c], Christian Jackson, M.S.Stat.[c], Stephanie L. Clendennen, M.P.H.[d], Alexandra Loukas, Ph.D.[e], and Melissa B. Harrell, Ph.D.[f]

[a] Department of Health Promotion and Behavioral Sciences at the University of Texas Health Science Center at Houston (UTHealth), School of Public Health, Austin, Texas
[b] Department of Biostatistics and Data Science, The University of Texas Health Science Center at Houston (UTHealth), School of Public Health, Austin, Texas
[c] Michael & Susan Dell Center for Healthy Living, The University of Texas Health Science Center at Houston (UTHealth), School of Public Health, Austin, Texas
[d] Tobacco Center of Regulatory Science on Youth and Young Adults, The University of Texas Health Science Center at Houston (UTHealth), School of Public Health, Austin, Texas
[e] Health Behavior and Health Education in the Department of Kinesiology & Health Education, The University of Texas at Austin, Austin, Texas
[f] Department of Epidemiology, Human Genetics and Environmental Sciences, The University of Texas Health Science Center at Houston (UTHealth), School of Public Health in Austin, Austin, Texas

A B S T R A C T

Purpose: Historically, adolescence has been regarded as the time when most tobacco use initiation occurs. This study examines the initiation of tobacco product use, including cigarettes, e-cigarettes, cigar products, and hookah, among contemporary youth and young adults, to determine whether the developmental timing (youth vs. young adulthood) of initiation has changed.
Methods: Three cohort studies were used to examine the onset of ever use and current (past 30 days) use of each tobacco product among never-using youth (11 to <17 years) and young adults (18−24 years) at baseline (2013−2015) to one-year follow-up (2015−2016). These studies include the national Population Assessment of Tobacco and Health Study, and two Texas cohort studies, the Texas Adolescent Tobacco and Marketing Surveillance System (TATAMS), and the Marketing and Promotions Across Colleges in Texas (M-PACT) project. Estimations of onset were computed using generalized linear mixed models for TATAMS and M-PACT. The rates of initiation in Population Assessment of Tobacco and Health Study were compared to standardized incidence rates from TATAMS to M-PACT.
Results: Young adults had significantly higher incidence rates than youth to initiate ever and current use of each/all tobacco products for all comparisons.
Conclusions: These findings extend prior research on the timing of the onset of tobacco use by using longitudinal analyses from three contemporary cohort studies to include not just cigarettes, but also e-cigarettes, cigar products, and hookah. Among those who were never-users of tobacco products, young adults began to ever and currently use all tobacco products more than youth in these samples, a marked departure from prior decades of research.

IMPLICATIONS AND CONTRIBUTION

This study reveals that the initiation of tobacco products among never-using young adults at the national and regional levels is now greater than among youth. This recent, unprecedented change suggests that young adults should receive greater attention so that their tobacco use does not become long-term with associated health consequences.

Historically, the developmental stage of adolescence is the time when cigarette smoking is initiated and progression to daily smoking is observed [1,2]. The first major conclusion of the 1994 Surgeon General's Report stated: "Nearly all first use of tobacco occurs before high school graduation; this finding suggests that *if adolescents can be kept tobacco-free, most will never start using tobacco*" (p.5). The conclusion was informed by data from the 1991 National Household Surveys on Drug Abuse. Among adults, ages 30−39, who had ever smoked daily, 89% first tried a cigarette and 71% began to smoke daily by age 18 (p. 65) [2]. These analyses were replicated for the 2012 Surgeon General's Report (p. 136) [1]. These data strongly suggest that the onset and regular use of cigarettes began in adolescence for adults who were smokers in 1991 and 2010 [1]. However, these data are somewhat limited since they are retrospective data from adults. Other prospective data, from the Add Health longitudinal study, are consistent with this conclusion (p. 248) [1].

There have been several major changes in tobacco-related products, marketing methods, and policies in the past decade [3,4], that could affect the ways in which youth and young adults initiate and use tobacco products. The most notable change is the introduction of new tobacco products, particularly electronic cigarettes (e-cigarettes), to the U.S. market in 2007, and their rapid adoption by adolescents and young adults [4]. Data from the National Youth Tobacco Survey indicate that 37.7% of high school students had ever used e-cigarettes and 16% were current users in 2015 [5]. Among young adults, ages 18−24, from the National Adult Tobacco Survey in 2013−2014, 35.8% had ever used e-cigarettes and 13.6% were current users [6]. A second change in the past decade involves increased access to and exposure to digital media, including marketing of a variety of products, including tobacco products, via digital and social media [7]. The iPhone's introduction in 2007 and other smartphones have made access to digital media and marketing nearly ubiquitous [8,9]. Unfortunately, exposure to digital marketing appears to affect subsequent tobacco use [10−12], with adolescents who reported seeing e-cigarette marketing on the internet having 2.2 times the odds of being current e-cigarette users six months later (compared with those who did not report exposure) [11]. A third change involves the implementation of the Family Smoking Prevention and Tobacco Control Act (TCA), which gave the Food and Drug Administration (FDA) the authority to regulate the manufacturing, distribution, and marketing of tobacco products [13]. The TCA originally included cigarettes, smokeless, and loose tobacco, but FDA's authority was extended to all tobacco products in 2016 [14]. One of the major charges of the TCA is to reduce tobacco use among adolescents under the age of 18. For example, the TCA banned some flavors of cigarettes and sponsorship at entertainment/sports events, prohibited free sampling of tobacco products and nontobacco branded items, and required manufacturers to seek approval or exemptions from FDA before introducing new tobacco products [15]. These regulations, in addition to those placed on marketing to youth by the 1998 Master Settlement Agreement, have all changed the potential for tobacco companies to market or appeal to youth [16]. As a possible response to these changes, among high school students, from 2011 to 2016, the use of cigarettes, cigars, and smokeless tobacco significantly decreased, while the use of e-cigarettes and hookah significantly increased [17].

Importantly, Thompson and colleagues [18] analyzed cross-sectional national data from 2006 to 2013, on adolescent (12−17 years old) and young adult (18−25 years old) cigarette use, using the National Survey on Drug Use and Health. They found that the rate of onset of cigarette smoking among adolescents was significantly less (1.9%) than onset among young adults (6.3%) during this time. Because this is such a notable departure from decades of research on the age of the onset of cigarette use, the current study extends this work by analyzing data from our ongoing longitudinal studies of youth and young adults in Texas, as well as the national Population Assessment of Tobacco and Health (PATH) study. The current study builds on prior work, by using contemporary data, from 2013 forward, examining the onset of ever and current (past 30 days) use of tobacco by age group (youth vs. young adults) and by product type (cigarettes, e-cigarettes, cigar products, and hookah). If young adults have become a higher risk group for tobacco use onset, then greater attention to preventing use prior to consolidation and addiction in adulthood will be crucial to future efforts to prevent tobacco-related morbidity and mortality.

Methods

Study design

Data in this study are derived from three longitudinal studies described below. These studies include two parallel, longitudinal studies of youth and young adults living in the five counties surrounding the four largest cities in Texas (Austin, Dallas/Fort Worth, Houston, San Antonio) between 2014-15 and 2016. The third study provides nationally-representative data on youth and young adults between 2013-14 and 2014-2015.

The Texas Adolescent Tobacco and Marketing Surveillance System (TATAMS) surveyed 6th, 8th, and 10th grade students at wave 1 (October 2014 to June 2015; n = 3,907), wave 2 (March 2015 to September 2015), and wave 3 (November 2015 to January 2016). Since there was an overlap in the overall timing of the first two waves of data collection, the TATAMS student surveys at wave 2 began at two time points to accommodate the long survey period in wave 1. The average time between waves for all students was 6 months. At wave 3, there was a 70% retention rate (n = 2,733; N = 308,460). TATAMS applies sampling weights to account for the complex design and to represent the population of the five counties [19]. Students completed the wave 1 survey using tablets in the 79 participating schools; participants in waves 2−3 responded to survey questions administered and completed online. Active, informed consent, and assent were obtained from parents and students.

The Marketing and Promotions Across Colleges in Texas project (M-PACT) surveyed students from 24 two-year and four-year colleges who were 18−29 years old (n = 5,482 at wave 1). The students were surveyed online at wave 1, and every six months thereafter, for waves 2−3, during similar dates as TATAMS, and from the same cities/counties. There was a 79% response rate at wave 3 (n = 4,321) [20]. Active and informed consent were obtained from young adults in M-PACT.

PATH study is a nationally-representative study of the civilian noninstitutionalized population of the United States who are 12 years and older. The sample size at baseline included 9,112 young adults of ages 18−24, and 13,651 youth of ages 12−17 [21]. Wave 1 data were collected via interviews with subjects from September 2013 to December 2014. Wave 2 data were collected one year later, 2014−2015 [21]. Data for this study come from the public and restricted use PATH data files [21].