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Original article

Prospective Predictors of Novel Tobacco and Nicotine Product Use in Emerging Adulthood



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A B S T R A C T

Purpose: The purpose of this study was to investigate whether risk factors for cigarette smoking assessed in adolescence predict the use of novel tobacco and nicotine products (hookah, little cigars, and e-cigarettes) in early emerging adulthood.

Methods: In a longitudinal study (N = 862), risk factors were measured in middle and high school, and novel product use was measured in emerging adulthood (mean age 22.4 years). Structural equation modeling was used to test a model predicting lifetime use of any of hookah, little cigars, and e-cigarettes in early emerging adulthood from distal predictors (gender, maternal smoking through Grade 8; already tried alcohol, cigarettes, or marijuana by Grade 8; and sensation seeking at Grade 8) and potential mediators (intentions to smoke cigarettes, drink alcohol or smoke marijuana at Grade 9, and smoking trajectory across high school).

Results: The most prevalent novel tobacco product was hookah (21.7%), followed by little cigars (16.8%) and e-cigarettes (6.6%). Maternal smoking, having already tried substances, and sensation seeking each predicted the use of at least one of these products via an indirect path through intentions to use substances and membership in a high-school smoking trajectory.

Conclusions: Risk factors for cigarette smoking were found to predict novel tobacco use, suggesting that interventions to prevent cigarette smoking could be extended to include common novel tobacco products.

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IMPLICATIONS AND CONTRIBUTION

In this prospective study, adolescent risk factors for cigarette smoking were found to predict the use of at least one novel product (hookah, little cigars, or e-cigarettes) in emerging adulthood. These findings suggest that effective interventions to prevent adolescent smoking should be extended to include novel product use.

The use of novel tobacco and nicotine products, particularly hookah, little cigars, and electronic cigarettes (e-cigarettes), is rapidly increasing among emerging adults (aged 18–29 years) compared with older or younger individuals [1,2]. Because each of these products may pose health risks, it would be valuable to identify adolescent predictors that could be targeted in prevention interventions.

Hookah (waterpipe) use has accelerated [3], with marked increases over recent years among high school [4] and college

students [5,6]. It has been estimated that 10%–20% of some young adult populations in the United States are current waterpipe users [3], and 30.5% of college students reported ever trying a waterpipe [6]. The health risks of tobacco smoked through a hookah may include decreased pulmonary function, cancer, and heart disease [7,8]. The use of little flavored cigars has increased among emerging adults in recent years despite their link with head and neck cancers and possibly the development of chronic obstructive pulmonary disease [9]. The 2013 Youth Risk Behavior Surveillance indicated that 12.6% of high-school students were current cigar smokers, with twice as many boys using cigars than girls [10]. The use of Electronic Nicotine Delivery Systems (aka e-cigarettes) to inhale vapor containing nicotine is rapidly

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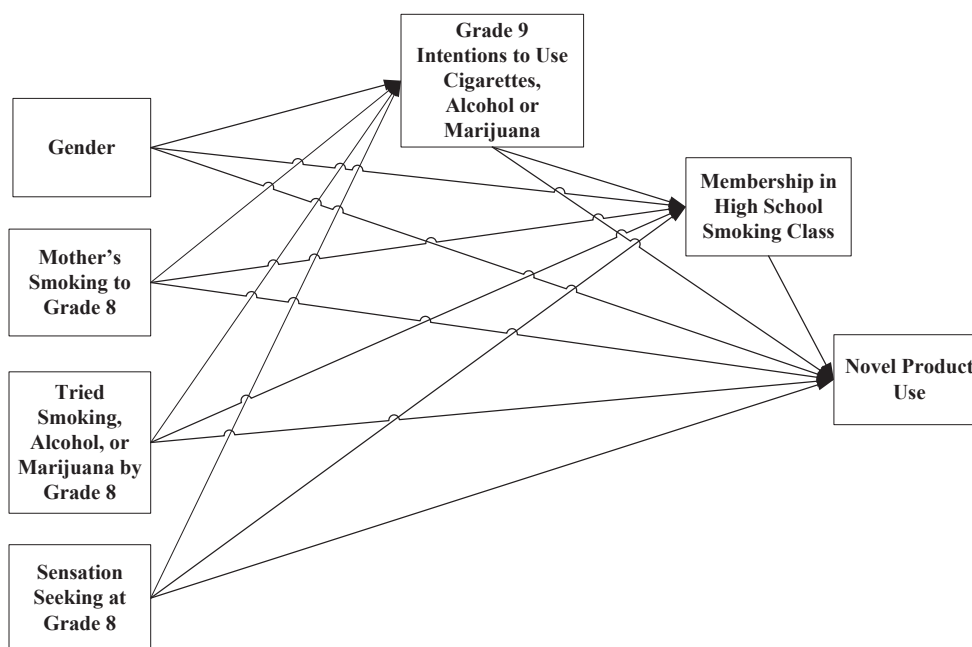


Figure 1. Conceptual model showing hypothesized directional paths from gender, mother's smoking, already tried substances, and sensation seeking (all measured at Grade 8) through Grade 9 intentions to use substances and high-school smoking trajectory.

escalating: one study reported 41% of young adults using e-cigarettes in the past month in 2013 compared with 6.2% in 2009 [11]. E-cigarettes appear to be less of a health risk than conventional cigarettes [12], but the potential long-term health effects of “vaping” are not known [13].

There has been little prospective research on predictors of novel tobacco products. However, novel tobacco use is more prevalent among smokers than that among nonsmokers [14–18], and prior use of alcohol and marijuana predicted hookah use 1 year later among female college students [5]. These findings suggest that there may be overlap among predictors of conventional tobacco and other substances and predictors of novel tobacco, consistent with a common liability model [19]. The common liability model proposes that the same influences (liabilities) underlie the use of different substances, both licit and illicit. These influences include mother's smoking [20,21], early trying of cigarettes and other substances in childhood [22], and adolescent sensation seeking. The trait of sensation seeking refers to the tendency to seek out experiences that are novel, exciting, or rewarding, and has been identified as a risk factor for under-age tobacco use and other illicit drug use [23]. These predictors may indirectly influence novel product use through more proximal precursors, including behavioral intentions and patterns of smoking across high school. Favorable intentions to use substances predict later use of cigarettes, alcohol [24,25], and marijuana [26,27].

In the present study, it was hypothesized that novel tobacco and nicotine product use in emerging adulthood would be influenced by variables assessed in adolescence that have been found to predict cigarette, alcohol, and marijuana use. Maternal tobacco use, early trying of substances, and higher levels of sensation seeking in the year before high school were expected to influence later novel product use through more proximal predictors of intentions to use substances (cigarettes, alcohol, or marijuana) and the level of smoking across high school. This

conceptual model is shown in Figure 1. The same predictors were tested across different novel products with the aim of identifying common and unique predictors.

Methods

Participants

The sample comprised 862 youth in the Oregon Youth Substance Use Project (OYSUP). The original sample was recruited using epidemiological sampling techniques from elementary students in the first through fifth grade within one school district in a working class community in Western Oregon. Parents of 1,075 children gave consent for their child's participation. At the first assessment (T1, 1998–1999), an average of 215 students in each grade cohort participated, 50.3% were female, and the mean age at T1 was 9.0 years ($SD = 1.45$). Participants were representative of students in the school district in terms of race/ethnicity (i.e., primarily white) and participation in the free or reduced school lunch program at the first assessment (40%), but the third and fifth grade cohorts had slightly higher achievement test scores on reading and math (for more details, including assessment procedures, see Andrews et al. [25]). These youth were assessed annually until 1-year post high school, and again at age 20–22 years. The original study and all its extensions were approved by the institutional review board at Oregon Research Institute.

All those in the original OYSUP sample, who had not actively withdrawn from the study and for whom we had current contact information ($N = 906$; 84% of the original 1,075 participants), were asked to complete a questionnaire in 2013 regarding their novel tobacco/nicotine product use: smoking shisha in a hookah, little cigars, and e-cigarettes and using snus and dissolvables. Among these, 862 (95%) completed the questionnaire. Of those who did not participate, nine were out of the country on religious

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