Drug and Alcohol Dependence 134 (2014) 309–313

Contents lists available at ScienceDirect

Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep

First-year college students' interest in trying dissolvable tobacco products

Mark Wolfson[a,*], Jessica R. Pockey[b], Beth A. Reboussin[c], Erin L. Sutfin[a], Kathleen L. Egan[a], Kimberly G. Wagoner[a], John G. Spangler[d]

[a] Department of Social Sciences and Health Policy, Wake Forest School of Medicine, Medical Center Boulevard, Winston-Salem, NC 27157, United States
[b] 12 Oak Leaf Lane, West Chester, PA 19382, United States
[c] Department of Biostatistical Sciences, Wake Forest School of Medicine, Medical Center Boulevard, Winston-Salem, NC 27157, United States
[d] Department of Family and Community Medicine, Wake Forest School of Medicine, Medical Center Boulevard, Winston-Salem, NC 27157, United States

ARTICLE INFO

Article history:
Received 3 February 2013
Received in revised form 23 October 2013
Accepted 24 October 2013
Available online 6 November 2013

Keywords:
Smokeless tobacco
College students
Experimentation

ABSTRACT

Background: Dissolvable tobacco products (DTPs) have been introduced into test markets in the U.S. We sought to gauge the level of interest in trying these products and correlates of interest among potential consumers.
Methods: A web-based survey of freshman at 11 universities in North Carolina and Virginia was conducted in fall 2010. Multivariable logistic regression analyses were used to identify correlates of students' likelihood to try DTPs if offered a free sample.
Results: Weighted prevalence of likelihood to try DTPs was 3.7%. Significant correlates of likelihood to try included male gender, current cigarette smoking, current snus use, sensation seeking, lifetime illicit drug use, and perceived health risk of using DTPs. Among current smokers, current snus use, current use of chewing tobacco, and considering quitting smoking were associated with likelihood to try DTPs.
Conclusions: While overall interest in trying these products was low, current users of cigarettes and snus were much more likely than others in trying a free sample. Some current smokers may consider DTPs to be an aid to smoking cessation, although the population-level impact of introducing these products is unknown.

1. Introduction

A new generation of smokeless tobacco products has entered the U.S. market, and grown in popularity, over the past several years. Snus, a moist snuff originating in Sweden and Norway, was the first such product to enter the U.S. market. Snus is packaged in small pouches, and is used like moist snuff, but does not require spitting. Snus products include R.J. Reynolds' Camel Snus and Philip Morris' Marlboro Snus, Copenhagen pouches, and Skoal Snus, among others. In the span of 7 years, snus has gone from being an exotic product in the U.S. (but used extensively in Sweden; Norberg et al., 2011), to a product introduced, accompanied by significant marketing efforts, in multiple test markets, to a nationally available product, with widespread recognition, especially among adolescents and young adults (Regan et al., 2012; Loukas et al., 2012).

The entry of dissolvable tobacco products (DTPs) into U.S. markets began with Star Scientific, Inc., which is primarily a producer of dietary supplements, introducing Ariva in 2001 and Stonewall in 2003. Ariva was offered as a substitute product for smokers, in times and circumstances where they could not smoke, and Stonewall was intended as an alternative to moist snuff (Hatsukami et al., 2007). Both were promoted as requiring neither spitting (as in traditional smokeless tobacco use) nor disposal of a spent pouch (as in use of snus; Business Wire, 2006).

In January 2009, R.J. Reynolds (RJR) introduced Camel Dissolvables (DTPs) in three U.S. test markets (in Indiana, Ohio, and Oregon). These products are in the form of dissolvable strips (lasting 5 min or less), orbs (pellets that last about 15 min) and sticks (slightly larger than a toothpick, lasting 15–20 min; Seidenberg et al., 2011). They contain finely milled tobacco, and are designed to dissolve in the mouth, eliminating the need to spit (Seidenberg et al., 2011). In addition to nicotine, they contain flavoring compounds, sweeteners, binders, and humectants (Rainey et al., 2011).

In March 2011, Altria, parent company of Philip Morris introduced Marlboro Sticks and Skoal Sticks into test markets in Kansas. That same month, RJR, which had pulled its DTPs from test markets in December, 2010, introduced redesigned orbs, strips, and sticks—in new packaging—into test markets in and around Charlotte, NC and Denver, CO (Campaign for Tobacco-Free Kids, 2010).

* Corresponding author. Tel.: +1 336 716 0380; fax: +1 336 716 7554.
E-mail address: mwolfson@wakehealth.edu (M. Wolfson).

0376-8716/$ – see front matter © 2013 Elsevier Ireland Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.drugalcdep.2013.10.025

Research on the health effects of DTPs is in its infancy. Based on laboratory research that has been conducted to date (Stepanov and colleagues, 2011; Stepanov, 2012; Watson, 2012; Evans, 2012), use of these products may pose potential health risks associated with toxicity and carcinogenicity. For example, there is the potential for chronic exposure to two of the most carcinogenic TSNAs (NNN and NNK) (Stepanov, 2012). Piano et al. (2010) concluded that there are no data on cardiovascular disease health risks associated with use of DTPs. Finally, for children, there is the danger of accidental nicotine poisoning (Connolly et al., 2010). Despite this recent laboratory research, a recent review concluded that "more clinical research is needed as well as standardized clinical evaluation processes to understand the health effects of DTPs" (Chen and Jacobson, 2012).

There are also concerns about the potential addictiveness of DTPs. Stepanov (2012) concluded that, for current smokers, there is the potential for sustained tobacco use, as these products may serve as "an alternative in situations where smoking is not allowed". Moreover, for new tobacco users, there is potential for addiction and graduation to cigarette smoking (Tobacco Products Safety Advisory Committee, 2012).

Based on the extant literature—sparse as it is—there is little reason to doubt that for any individual user, exclusive use of DTPs—like use of other smokeless tobacco (SLT) products—poses far less risk than exclusive use of cigarettes (Rodu, 2011). However, in order to understand the overall public health significance of a product, it is imperative to understand its population effects—including its impact on the use of other products. Mejia et al. (2010) argue that to evaluate the health impact of SLT promotion, it is necessary to know, in a population, the proportion of non-users who will initiate either cigarette use or SLT use, and, within these categories of users, what proportions will continue to use, become dual users, or quit using.

To date, data on the appeal, likelihood to try, and initiation and use of the new wave of DTPs being test marketed are very sparse. In a 2009 consumer survey of adults, Regan and colleagues (2012) assessed awareness and trial of DTPs. Despite these DTPs having only recently come onto the market—and even then, limited to a few test markets—10.4% of respondents reporting having heard of DTPs, and 0.5% had tried them. Factors that were positively associated with having heard of DTPs included being male (OR = 1.6), black (OR = 1.5), lower income (<$15,000 compared to ≥$65,000; OR = 2.2), and younger age (18–24 year olds versus 65 and over; OR = 4.0). Less than 1% of individuals in this national sample reported having tried DTPs. Romito et al. (2011) conducted a survey on Camel dissolvables awareness, attitudes, and use in a convenience sample of 243 college students and dental patients in the (then) Indianapolis test market. Product awareness was reported by 42% of respondents, and trial by 3%. Males, and current and former smokers, showed the highest rates of interest and trial. Finally, in a survey of a nationally representative sample of U.S. adults, McMillen et al. (2012) found that 0.6% had tried DTPs. Males and nondaily smokers had somewhat higher rates of use than others (1.2% and 2.7%, respectively).

It is known that smokeless tobacco products, including snus, are intentionally marketed to college students and other young adults (Choi and Forster, 2012; Campaign for Tobacco-Free Kids, 2010; Klein, 2007). New products, including snus and, potentially, DTPs—if they are released nationally—may allow current smokers to get nicotine in places where smoking is not permitted (Choi and Forster, 2012)—a condition that is increasingly the norm on college campuses. In this study, we assessed college students' willingness to try a free sample of DTPs. We sought to gauge the overall level of interest in trying these products, and to identify demographic and behavioral characteristics that are associated with interest in trying. In particular, given debates about whether new SLT products are likely to appeal to nonusers of cigarettes (as "starter" products), or to current users of cigarettes (either as aids to quitting or as a means to maintain their nicotine habit, alternating between smokeless tobacco use and smoking, depending on situational factors), we examined current use of various tobacco products as potential correlates of likelihood to try DTPs if offered a free sample.

2. Methods

2.1. Sample

Data presented in this paper are from the Smokeless Tobacco Use in College Students study. The goal of the overall study is to assess trajectories and correlates of smokeless tobacco use in a cohort of college students by surveying them each semester beginning in their freshman year and continuing through the fall of their senior year. Eleven colleges and universities are participating in the study; seven are located in North Carolina and four are in Virginia. Nine are public schools and two are private. Five schools are in rural communities, four are in suburban communities, and two are in urban communities. Undergraduate enrollment ranges from 4024 to 23,730.

To identify potential members of the cohort, we conducted a screener survey in the fall of 2010. Emails were sent to all 1st-year students at each of the participating colleges (N = 29,536) inviting them to participate in a short web-based survey, which took approximately 5 min to complete. Survey completers were eligible for a raffle, with 10 students per school winning a $100 debit card. Non-responders were sent reminder emails (up to three). Across 11 schools, 10,528 freshmen age 18 or older completed the screener survey in early fall 2010 (Spangler et al., in press). Two weeks following the screener survey, data from the survey were used to create a sampling frame of students eligible for the cohort, which was stratified by school, gender, and history of tobacco use. To ensure an adequate number of students at risk, students who ever used SLT, current smokers and males were oversampled at each school. The total number of students invited into the cohort across all campuses was 4910, of which 3146 (64.2%) joined the cohort and completed the baseline fall 2010 survey.

2.2. Procedure

Participants in the cohort survey completed a 15–20 min web-survey in fall 2010 (from which the data for this paper are drawn), and were asked to participate in similar surveys annually or biannually through the fall of their senior year. Students were sent an email invitation, which included information about the survey and a link to a secure website where the survey could be completed. Non-responders received up to five email reminders, a phone call and a text reminder. Participants received a $15 incentive for completion of the survey. The study protocol was approved by the Wake Forest School of Medicine Institutional Review Board, and, where requested, by the Institutional Review Board of the college or university providing contact information for freshman students. Additional privacy protection was secured by the issuance of a Certificate of Confidentiality by the U.S. Department of Health and Human Services.

2.3. Measures

The analyses presented below included variables reflecting students' demographic characteristics, personality characteristics, and use of alcohol, tobacco, and illicit drugs. These variables were selected based on past research on smokeless tobacco use—in particular, use of new smokeless products, such as snus (Biener and Bogen, 2009; Biener et al., 2011; Loukas et al., 2012; Regan et al., 2012).

Demographic variables included gender (reference = female), age (reference = over 18), race (white or non-white; white is the reference category), Hispanic ethnicity (reference = non-Hispanic), mother with college degree (reference = no college degree), and father with college degree (reference = no college degree). Sensation seeking, which is defined as the tendency to seek novel and thrilling experiences, has been found to be associated with adolescent experimentation with smoking (Zuckerman et al., 1990). The Brief Sensation Seeking Scale (Hoyle et al., 2002; Stephenson et al., 2003) was used to assess sensation seeking. We also included a measure of spending money in an average month (reference = <$100).

The outcome variable was constructed based on responses to a series of questions asking about dissolvables, which were accompanied by pictures of the leading dissolvable products being sold in the test markets at the time (including Camel sticks, strips and orbs; and Stonewall and Ariva tablets). The pictures were accompanied by a lead-in statement, which said: "Another type of smokeless tobacco product which is not burned or smoked is called dissolvables. Several examples are shown here". Students were first asked, "Are you aware of this type of smokeless tobacco: dissolvables"; response categories were "Yes" and "No". A variable based on this question was included as a covariate in the multivariable analyses presented below (with "No" as the reference category). Students were then asked, "How likely would you be to try dissolvables if you were offered a free sample?" For the analysis presented below, the response categories of "Definitely yes" and "Probably yes" were combined to represent "yes", and "Probably no" and "Definitely no" responses were classified as "no".