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Healthcare Providers' Beliefs and Attitudes About Electronic Cigarettes and Preventive Counseling for Adolescent Patients

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A B S T R A C T

Purpose: Electronic cigarettes (e-cigarettes) are battery-powered nicotine delivery systems that may serve as a "gateway" to tobacco use by adolescents. Use of e-cigarettes by U.S. adolescents rose from 3% in 2011 to 7% in 2012. We sought to describe healthcare providers' awareness of e-cigarettes and to assess their comfort with and attitudes toward discussing e-cigarettes with adolescent patients and their parents.

Methods: A statewide sample (n = 561) of Minnesota healthcare providers (46% family medicine physicians, 20% pediatricians, and 34% nurse practitioners) who treat adolescents completed an online survey in April 2013.

Results: Nearly all providers (92%) were aware of e-cigarettes, and 11% reported having treated an adolescent patient who had used them. The most frequently cited sources of information about e-cigarettes were patients, news stories, and advertisements, rather than professional sources. Providers expressed considerable concern that e-cigarettes could be a gateway to tobacco use but had moderately low levels of knowledge about and comfort discussing e-cigarettes with adolescent patients and their parents. Compared with pediatricians and nurse practitioners, family medicine physicians reported knowing more about e-cigarettes and being more comfortable discussing them with patients (both $p < .05$). Nearly all respondents (92%) wanted to learn more about e-cigarettes.

Conclusions: Healthcare providers who treat adolescents may need to incorporate screening and counseling about e-cigarettes into routine preventive services, particularly if the prevalence of use continues to increase in this population. Education about e-cigarettes could help providers deliver comprehensive preventive services to adolescents at risk of tobacco use.

IMPLICATIONS AND CONTRIBUTION

In this statewide sample, healthcare providers reported moderately low levels of knowledge about and comfort discussing electronic cigarettes with adolescent patients; nearly all wished to learn more. Findings highlight information gaps that may be a barrier to providing comprehensive prevention services to adolescents at risk of tobacco use.

Electronic cigarettes (e-cigarettes) are devices that typically look like regular cigarettes but deliver vaporized nicotine without tobacco combustion. Public interest in e-cigarettes is skyrocketing [1], but these novel products are controversial among health professionals [2]. Safety information is sparse and inconsistent [3,4], and regulation is in flux [5]. Public health experts are currently divided about whether e-cigarettes are best understood as a potential harm reduction tool for current smokers or a "gateway" to nicotine dependence and, in turn, other tobacco use.

One point of consensus, however, is that protections must be put in place to ensure that young people who are at risk for smoking initiation do not use e-cigarettes [6]. Although rates of

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e-cigarette use were extremely low (<1%) in one 2011 study with a national sample of U.S. adolescent males (ages 11–19) [7], more recent data from the National Youth Tobacco Survey indicate greater prevalence [8]. From 2011 to 2012, ever-use of e-cigarettes increased from 1% to 3% among middle school students (Grades 6–8) and from 5% to 10% among high school students (Grades 9–12). Of particular concern, nearly 10% of students who had tried e-cigarettes had never smoked a traditional cigarette. If e-cigarettes act as a "gateway" product, these youth could be at high risk for initiating tobacco use.

Several national organizations, including the American Academy of Pediatrics (AAP) and the U.S. Preventive Services Task Force, point to the important role that healthcare providers play in prevention by giving guidance to adolescent patients and their parents about risk behaviors, including tobacco use [9,10]. Current guidelines include screening for tobacco use as a part of routine health care; asking about tobacco use among patients' families and friends; educating about health risks; and providing cessation counseling for those patients who use cigarettes or other tobacco products [9–12]. Recent evidence suggests that brief, preventive counseling with a primary care provider shows promise for decreasing adolescent risk behaviors, including smoking [13]. Although e-cigarettes, as a relatively new product, are not explicitly mentioned in current guidelines, knowledge about these nicotine-containing devices is important for providers who wish to deliver comprehensive tobacco-related counseling to their patients.

Despite the potential for healthcare providers to deliver education and guidance about e-cigarettes to adolescent patients, research has yet to explore providers' perceptions of this emerging health issue. We sought to describe providers' awareness of e-cigarettes and to assess their comfort with and attitudes toward discussing e-cigarettes with adolescent patients and their parents. We also aimed to explore differences in awareness and attitudes by provider age and specialty.

Methods

We surveyed a statewide sample of physicians and nurse practitioners who provide preventive care to preteens and adolescents ages 11–17 years. We identified potential participants through publicly available lists provided by the Minnesota Boards of Medical Practice and of Nursing. From these lists, we sampled providers in pediatric and family medicine specialties, excluding providers without e-mail addresses or Minnesota mailing addresses. Because our sampling frame included many providers who may not provide preventive care to adolescents (e.g., neonatal specialists), the survey used a screener question to determine eligibility. Providers who indicated on the screener that they provided preventive care to adolescent patients ages 11–17 years were eligible to participate.

In April 2013, we invited 3,923 healthcare providers to participate in the study. A total of 615 providers were eligible, gave informed consent, and completed the cross-sectional, online survey (adjusted response rate 28% based on American Association for Public Opinion Research (AAPOR) formula 4) [14]. Among those who responded to the screening questions and were eligible, the cooperation rate was 85%. Study data were collected and managed using REDCap (Research Electronic Data Capture) tools hosted at the University of Minnesota [15]. Participants received an invitation describing the study's purpose and providing a link to the survey. Nonresponders received up to three reminder e-mails. The present analysis uses data from 561 providers who answered questions about e-cigarettes. Providers who responded to the survey items about e-cigarettes did not differ from those who did not with regard to any of the assessed sociodemographic characteristics (all $p > .05$). The institutional review board at the University of Minnesota approved the study.

Measures

We developed e-cigarette items based on our previous research with adolescents [7]. We cognitively tested measures with five healthcare providers to identify potential sources of response error and improve survey items [16].

Prior to questionnaire items about e-cigarettes, the survey provided a picture of an e-cigarette accompanied by the statement: "An electronic cigarette (e-cigarette) looks like a regular cigarette, but it runs on a battery and produces nicotine vapor instead of smoke. There are many types of e-cigarettes. Some common brands are Smoking Everywhere, NJOY, Blu, and Vapor King." The survey then assessed providers' awareness of e-cigarettes with the question "Before today, had you ever heard of e-cigarettes?" For those who responded "yes," questions assessed their perceived knowledge of e-cigarettes, whether they had heard about e-cigarettes from any of a list of nine potential sources (including from a patient, a colleague, an advertisement, and a professional source such as a journal article or newsletter), as well as whether they thought they had ever provided care to an adolescent patient who had used an e-cigarette.

Among all providers, the survey assessed comfort talking with adolescent patients about e-cigarettes (*1* = "very uncomfortable" to *4* = "very comfortable"). Finally, seven items measured a range of attitudes and beliefs using a 4-point response scale (*1* = "strongly disagree" to *4* = "strongly agree"). These items focused on risk beliefs ("E-cigarettes are safer to use than regular cigarettes"; "E-cigarettes are safer to use than smokeless tobacco (chew, snuff, dip, etc.)"; and "E-cigarettes could be a 'gateway' to other tobacco use") and communication ("My adolescent patients do not know about e-cigarettes"; "Discussing e-cigarettes with patients may encourage them to use e-cigarettes"; "It is important to discuss e-cigarettes with adolescent patients"; and "Parents of adolescents need to know about e-cigarettes"). An additional item used the same response scale to assess desire for education about e-cigarettes ("I would like to learn more about e-cigarettes"). The survey also gathered demographic and practice characteristics, including provider type (family medicine physician, pediatrician, or nurse practitioner), year of training completion, type and location of primary clinical practice, and number of adolescent patients (ages 11–17 years) seen per week.

Analysis

We examined univariate characteristics of the three main dependent variables (awareness of, knowledge of, and comfort discussing e-cigarettes), as well as correlations of these variables with providers' age. We used one-way ANOVA to test for differences in the three dependent variables by provider type. We treated two highly correlated risk perception items ("E-cigarettes are safer to use than regular cigarettes" and "E-cigarettes are safer to use than smokeless tobacco [chew, snuff, dip, etc.]") as a scale (Cronbach's $\alpha = .92$) and examined correlations of the scale with beliefs about the importance of discussing e-cigarettes with patients and their parents. Missing values were imputed to the