Research Note

Electronic cigarette use, knowledge, and perceptions among health professional students

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ABSTRACT

Introduction: Our study evaluated the electronic cigarette (e-cigarette) use, knowledge, and perceptions of health professional students enrolled in one of five colleges at a single academic health center.

Methods: A 56-item survey was conducted to examine the use, knowledge, and perceptions of e-cigarettes among health professional students. An e-cigarette knowledge score was calculated according to correct responses to eight true-false survey items, with possible scores ranging from zero to eight points. Regressions were used to determine associations between students' enrolled college/discipline and e-cigarette knowledge scores and to identify associations between three perception domains (smoking cessation, harm reduction, and enhanced regulation) and e-cigarette use.

Results: Of the 853 students responding, 24.2% reported e-cigarette ever-use. Of e-cigarette ever users, 85.5% had used within the past year, and 23.1% used e-cigarettes for smoking cessation. Participants from the colleges of public health, pharmacy, and nursing had significantly higher knowledge scores, compared to those in allied health. Knowledge scores from college of medicine participants did not differ significantly compared to scores from allied health. Perceptions of using e-cigarettes for smoking cessation, reduced harm compared to tobacco, and reduced e-cigarette regulation were significantly associated with using e-cigarettes.

Discussion and conclusions: Self-reported ever-use of e-cigarettes among health professional students in this sample was 3.5–6 times higher than previously reported among medical and nursing students. Substantial gaps in e-cigarette knowledge exist. Enhancing health professionals' preparedness to effectively advise patients about the benefits and harms of e-cigarettes is crucial.

Introduction

Electronic cigarettes (e-cigarettes) have increased in popularity since their introduction in 2007.[1] In 2014, 12.6% of adults in the United States (US) reported ever trying e-cigarettes, with 18–24-year-olds having the highest prevalence at 21.6%.[2] Given the popularity, incomplete understanding of health effects, and limited regulation, significant controversy surrounds e-cigarettes.

Proponents argue that e-cigarettes allow users to retain most of the sensory, behavioral, and social components associated with smoking and may serve as a safer substitute for tobacco and as a tobacco cessation aid.[3] One study found nearly two-thirds of e-

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cigarette retailer websites contain smoking cessation messages.[3,4] Research related to e-cigarette use in smoking cessation is ongoing, but recent findings have provided some support for e-cigarettes improving rates of successful quit attempts.[5,6] In addition, British professional organizations and government health services now promote the use of e-cigarettes to help tobacco users quit smoking.[7,8] However, opponents view e-cigarette use as a setback toward eliminating smokers' nicotine use and worry that widespread availability of e-cigarettes may introduce nonsmokers to nicotine, with one study finding 12% of tobacco-naïve adults indicating ever-use of e-cigarettes.[9] Another concern is that increased availability and social acceptance of e-cigarettes could lead to a subsequent increase in tobacco cigarette use.[10] In the US, professional groups and government entities continue to cite insufficient evidence to support e-cigarettes for smoking cessation.[11–16] Until the May 2016 announcement and the subsequent finalized rule in August 2016 by the US Food and Drug Administration (FDA) (and at the time this study was conducted), e-cigarette products, manufacturing, sales, marketing, and use were outside the constraints of regulatory controls.[17] Prior to this announcement, concerns related to the then unregulated industry, including lack of safety testing, quality control, marketing limits, labeling requirements, and long-term health outcomes were previously identified in the literature.[1,18]

Although the use and perceptions regarding e-cigarettes have been studied in older teens and college students, a specific investigation of health professional students has not been reported. As e-cigarette ever-use is both prevalent among young adults and a developing health controversy, health professional students are likely to have direct or indirect experience with e-cigarettes. As future health professionals, these students will be in the position to initiate patient conversations on the subject. A better understanding of their perspective is valuable with regard to their preparation and training. The objective of this study was to investigate e-cigarette use, knowledge, and perceptions among health professional students.

Methods

Setting

A cross-sectional survey was conducted in August 2014 after institutional review board approval. All students currently enrolled in a health professional degree or certificate program in one of five colleges within a single US academic health center (University of Arkansas for Medical Sciences) were invited to participate. Degree and certificate programs included those in medicine, nursing, pharmacy, public health, or allied health (i.e., audiology and speech pathology, dental hygiene, dietetics and nutrition, emergency medical services, genetic counseling, health information management, imaging and radiation sciences, laboratory sciences, ophthalmic medical technology, physical therapy, physician assistant, respiratory care, and surgical technology).

Design

Informed consent and response data were obtained via anonymous online questionnaire (SurveyMonkey®). Participants were given a two-week period to complete the questionnaire following an emailed invitation to participate. In the invitation to participate, the term "e-cigarettes" was introduced to refer to all electronic nicotine delivery systems and as synonymous with other popular terms for the devices (electronic cigarettes, e-cigs, vape pens or pipes, or e-hookah pens or pipes). At the end of the questionnaire, participants were given the option of providing their contact information for a drawing to win one of two iPod Shuffles®. Responses were not linked to contact information to maintain participants' anonymity.

Instrument

A 56-item self-reported questionnaire was developed and validated for content by the investigator team. Conditional logic was used to assess participants' personal history of tobacco smoking (cigarettes, cigars, pipe, hookah, etc.); e-cigarette use, knowledge, and perceptions; and education related to smoking cessation. Following the consent to participate, participants were asked whether they had previously heard of e-cigarettes. Those affirming familiarity were directed to questionnaire items to assess their use, knowledge, and perceptions. Remaining participants provided general information about health status, tobacco use habits, and demographic data only.

The knowledge section of the questionnaire consisted of eight items presented in a true-false format (Table 1). A knowledge score was calculated by assigning one point for each correct response, with possible scores ranging from zero to eight points. The knowledge score was not calculated if the participant did not answer all eight knowledge items.

Perception items were organized into three domains: smoking cessation (three items), perceived harm reduction (five items), and enhanced regulation (seven items). For each statement, participants were presented with five Likert-based response options (1 = strongly disagree; 2 = disagree; 3 = neutral/unsure; 4 = agree; 5 = strongly agree). Domain scores were calculated by averaging all items in the domain. Domain scores ranged from one to five, with higher scores indicating higher agreement.

General demographic data included age, gender, enrolled college, and progression in professional curriculum. Students enrolled in more than one degree program self-identified their primary college of enrollment and were subsequently included in all analyses within the primary college. The questionnaire was reviewed for content and readability by two authors and took approximately five to ten minutes to complete.