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Experiences in Teaching and Learning

## Community education by advanced pharmacy practice experience students: Increasing electronic cigarette awareness amongst teens

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## ARTICLE INFO

## Keywords:

Electronic cigarette  
Adolescent  
Safety  
Survey  
Advanced pharmacy practice experience  
Advocacy

## ABSTRACT

**Background and purpose:** An electronic cigarette (e-cigarette) is a device used to mimic the experience of smoking tobacco cigarettes. Considering their growing popularity amongst adolescents, it is imperative that education surrounding e-cigarettes be provided. The purpose of this project is to describe the development and delivery of a pilot interactive presentation and survey tool by doctor of pharmacy (PharmD) candidates to gauge the use and understanding of e-cigarettes amongst teens.

**Educational activity and setting:** An interactive presentation providing information on e-cigarettes was created by a PharmD candidate, and presented to 357 high school students in Massachusetts and New Hampshire. An anonymous survey tool was administered after the presentation to evaluate students' perception, use, and knowledge of e-cigarettes.

**Findings:** When asked which is safer, an e-cigarette or a tobacco cigarette, most students (84%) responded "neither," and most stated that they learned something new from the presentation. Of the 96% of students that indicated they had heard of e-cigarettes, 27% of them had tried one. PharmD candidates reported increased confidence in public speaking and preparation of patient-suitable material.

**Discussion:** This pilot project provided both education to adolescents and insight into their experience and understanding of the potential harms of e-cigarettes. Having a PharmD candidate deliver the presentation may have increased the students' level of comfort.

**Summary:** An interactive, PharmD candidate-delivered presentation about e-cigarettes is an innovative method to both provide education about e-cigarettes, and ascertain information about knowledge and use in adolescents. Facilitating presentations like this could be successful in other settings or topics.

## Background and purpose

An electronic cigarette (e-cigarette) is a device used to mimic the experience of smoking traditional tobacco cigarettes. Within the device is a cartridge containing a vaping solution which is vaporized and inhaled by the user; this cartridge may be refilled or disposed of after one use depending on the product. Since initial marketing in the United States in 2007, e-cigarettes have grown immensely in popularity.<sup>1</sup> The World Health Organization (WHO) estimates that e-cigarettes, a \$3 billion-dollar industry, will surpass

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<http://dx.doi.org/10.1016/j.cptl.2017.07.022>

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the earnings of tobacco cigarettes by 2017. According to the 2013 National Youth Tobacco Survey, of more than 250,000 adolescents who have used an e-cigarette, but not a tobacco cigarette, 43.9% reported intention to smoke tobacco cigarettes within the next year compared to only 21.5% of those surveyed who had never smoked a tobacco cigarette.<sup>2</sup> This suggests that e-cigarettes may be a gateway to smoking tobacco cigarettes for adolescents. The 2014 National Youth Tobacco survey identified that although tobacco cigar and tobacco cigarette use amongst youth is decreasing, e-cigarette use is increasing.<sup>3</sup> Overall, a staggering two million youth had tried an e-cigarette at least once within 30 days of the survey, and the rate of use amongst high school students specifically was 13.4%. The highly addictive nature of nicotine is particularly concerning in the developing teen brain.<sup>2</sup> The CDC reports that three out of four teen smokers will continue to smoke into adulthood, despite the intention to quit early on in their use. This information not only showcases the strength of nicotine's addictive properties, but puts into perspective a teen's lack of intention to become a chronic smoker. Even though e-cigarettes may be the top industry earner in the future, the sale of tobacco cigarettes may also increase due to the bridge to nicotine dependence created by e-cigarettes.

Until recently, e-cigarettes remained unregulated by the Food and Drug Administration (FDA).<sup>1</sup> In May 2016, the FDA announced that effective August 8, 2016, e-cigarettes are considered a covered tobacco product, and as such, sales will be limited to those 18 years old and older, health warnings must be added to labeling, and manufacturing establishments and product lists must be registered with the FDA.<sup>4</sup> Due to the paucity of federal guidance on quality, standardization and purity, manufacturers have not been required to prove accuracy of labels on vaping solutions. This is in part due to the rapid rise in popularity of these devices combined with the lack of adequate research studying the carcinogenic potential of vaping solution flavorings *in vivo*. Additionally, discrepancies in the amount of nicotine in each product were found to exist in a chromatographic analysis, including presence of nicotine in products labeled as "nicotine-free."<sup>5</sup> The same analysis of selected e-cigarette products found that none of the cartridges contained the amount of nicotine printed on the devices' packaging.

There are studies that have investigated e-cigarettes as a smoking cessation tool, but results have been inconclusive.<sup>6</sup> Interestingly, the Royal College of Physicians<sup>7</sup> in the United Kingdom, advocates for their use for smoking cessation as a harm reduction technique, noting that e-cigarettes may be less toxic than tobacco cigarettes, despite being more toxic than nicotine replacement therapy. In their report, it is acknowledged that more regulations should be implemented to reduce harm from e-cigarettes. The debate surrounding the use of e-cigarettes for adults as a smoking cessation tool is contentious in the United States, and they are not recommended as a cessation tool at this time. That being considered, the focus of this presentation is to educate teens about the dangers of e-cigarettes in hopes it will deter use at all.

Due to increased popularity and the potential for becoming a gateway to tobacco cigarettes for teens, it is imperative that education surrounding e-cigarettes be provided to this population. The purpose of this paper is to describe the development and delivery of an interactive presentation and survey tool by doctor of pharmacy (PharmD) candidates. The goal of this pilot project is to foster engagement and interest in the topic amongst the student audience via an interactive presentation. As well as provide PharmD candidates with increased practice in presentation and communication skills.

## Educational activity and setting

An interactive slide presentation on e-cigarettes was created by a PharmD candidate during a patient advocacy advanced pharmacy practice experience (APPE) rotation and delivered to high school students in Massachusetts (MA) and New Hampshire (NH) over the course of a year and a half. Schools that participated were self-selected, in that they were local to the university and expressed interest in the presentations. A total of four PharmD candidates presented and provided feedback during this time. Each session began with an initial didactic presentation of background information on the risks of tobacco products and e-cigarettes. Students were then divided into teams for an interactive Jeopardy™-style game. The PharmD candidates provided pertinent pearls of information and facilitated the discussion after each question, under supervision of the faculty preceptor. The purpose of the game was to encourage engagement and discussion, rather than assess prior knowledge. Another method of delivering information was the use of video clips depicting some cases of explosions of e-cigarettes. [Table 1](#) summarizes the content of the presentation. At the end of the session, a paper survey tool was distributed to students, who were asked to complete it anonymously ([Appendix A](#)). The survey tool was developed by the PharmD candidates and pharmacy practice faculty preceptors during program inception as a tool to efficiently gauge students' feedback about the pilot project as well as their use and understanding of e-cigarettes. Because the initial

**Table 1**  
Presentation discussion points.

Category	Discussion points		
<b>Cigarettes</b>	Cigarette smoking results in more than 480,000 deaths in the United States each year.	Cigarette smoking accounts for about one-third of all cancers, including 90% of lung cancer cases.	Greatly increases your risk for heart disease, stroke, lung diseases, and cancer.
<b>E-Cigarettes</b>	Some contain a nicotine based liquid called e-juice or e-liquid.	Produce a vapor cloud similar to smoke.	Can look like a cigarette, or be much larger.
<b>Dangers of electronic cigarettes</b>	Some have been found to contain antifreeze and formaldehyde.	E-cigs are not regulated.	It's possible to overdose on nicotine.
<b>How can electronic cigarettes affect me?</b>	Difficulty breathing/playing sports	Worsen asthma	Chronic cough/chest pain

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