

The AVOID Plan: Model of Success to Limit Electronic Vaping Rates on a College Campus

Theresa A. Kessler

Valparaiso University, College of Nursing and Health Professions
836 LaPorte Avenue, Valparaiso, IN 46383, USA

Lynette Rayman

Valparaiso University, College of Nursing and Health Professions
836 LaPorte Avenue, Valparaiso, IN 46383, USA

ABSTRACT

Background: College students are a demographic group in which vaping is especially prevalent. National experts recommend promoting awareness of e-cigarette harm, implementing evidence-based prevention and treatment activities, and promoting tobacco free campus policies. **Methods:** A student-faculty collaborative research team initiated the Anti-Vaping Ongoing Information Dissemination (AVOID) plan based on best evidence and the results of a pre-implementation survey. The pre- and post-implementation surveys were distributed to random, stratified samples and assessed demographic information, vaping behaviors, and intentions for behavior change. A multicomponent, tailored intervention was created. Strategies with cessation and Quitline information included social media posts on Instagram; tabling displays in campus buildings; public service announcements, distribution of educational materials, and stress balls at sporting events; campus TV messages; coverage of issues related to vaping in the university student newspaper; a YouTube video; and educational posters/pamphlets displayed in campus buildings. **Results:** Post-implementation, all students ($n = 487$) reported seeing at least one AVOID strategy, with posters (74.3%, $n = 345$) as the most viewed followed by social media posts (40.5%, $n = 188$). Reported intentions to quit according to the Transtheoretical Model stages of change was significantly different following the multicomponent educational strategies ($\chi^2(5) = 26.408, p < .001$), with 61.5% planning to quit within the next 6 months compared to 33.3% pre-implementation. **Conclusions:** Collaborative educational initiatives such as the AVOID program should continue on college campuses. Campus representatives should inform college students who vape and those who might begin the behavior about the negative effects of vaping.

Keywords: vaping, college students, e-cigarettes, behavior change, education, evidence-based

INTRODUCTION

College students, who are often of-age to purchase electronic vaping devices, are a demographic group in which vaping is especially prevalent. In 2020, 18% of college students reporting vaping in the last 30 days [1], and the most recent rate among college students was 21.2% [2].

College students may not self-identify as e-cigarette users even if they vaped in the last 30 days potentially impacting the accuracy of reported rates. Many students are unaware of the potential harm from e-cigarette use; they often believe vaping is less risky than cigarette smoking [3] and not a serious concern [4]. Multiple factors were related to vaping practices of college students including age, length of vaping history [5]; curiosity, use by friends [6]; and male gender, fraternity and sorority life involvement, GPA, and decreased athletic ability [7].

E-cigarette corporations, such as JUUL, have launched campaigns towards young adults and students stating vaping is a safer alternative to cigarettes and can be used as a quit device compounding the increased risk of vaping. These campaigns were successful with over 80% of college students being aware of the product; 36% reporting ever use; and 20% reporting current use [6]. However, e-cigarettes are not approved as a quit smoking aid by the Federal Drug Administration [8]. E-cigarettes are not safer than non-use of cigarettes for young adults, and more research is needed to determine their effectiveness for quitting smoking [8]. Additionally, previous evidence suggests that college students are *generationally chill*, meaning they believe their generation is less judgmental than previous generations [7]. Without peer pressure, college students may make poor decisions regarding the use of harmful substances and are less likely to ask peers to not vape.

The American College Health Association recommends promoting awareness of e-cigarette harm, implementing evidence-based prevention and treatment activities, and promoting tobacco free campus policies [9]. CATCH My Breath, an evidence-based program, is the most-used youth nicotine vaping prevention program [10, 11]. Furthermore, evidence suggests that an effective framework to reduce e-cigarette use in college students is the Transtheoretical Model (TTM) of Change [5, 12]. The TTM posits health behavior change involves progression through five stages from precontemplation to maintenance [13]. According to the model, e-cigarette cessation can span these five stages, with specific behaviors unique to each stage. Interventions, according to stage, are targeted to help students eventually abstain from the behavior.

In the first stage of the TTM (precontemplation), students are typically unaware they have a problem or are not thinking about quitting e-cigarettes within the next 6 months. In the second stage (contemplation) the pros and cons of the problem are weighed along with a solution for quitting within the next 6 months. During stage 3 (preparation), small changes are already being made, and students are considering quitting within the next 30 days. In the fourth stage (action) attempts to quit are successful for up to 6 months. The fifth and final stage (maintenance) is when the student continues to maintain the successful change, abstaining from e-cigarette usage for more than 6 months [5, 12]. A final goal is to eventually achieve termination of the behavior with zero temptation and 100% self-efficacy, but the termination phase is typically not included because of the difficulty of achieving this stage [14].

Without intervention, individuals may remain stuck in earlier stages. Specific stages are aligned with action processes to promote a greater impact on health. Depending on a person's stage of change and their demographic information, interventions should be tailored for change to occur and should focus on the pros and cons of the new behavior. For example, if a person has utilized e-cigarettes for more than 6 months, they are less likely to be in an early stage of the TTM and a different set of interventions is required [5]. Designing interventions to match

specific demographics, such as peer influencing or social media campaigns for younger users, may increase cessation practices. Aligning these strategies with the TTM could potentially increase awareness in the college population regarding both the dangers of e-cigarettes and the likelihood of cessation success [15].

Educational campaigns can be part of evidence-based strategies to affect change for risky behaviors prevalent within a population and influence a larger percentage of individuals who are susceptible to those behaviors. On college campuses, undergraduate nursing students can be instrumental in facilitating health behavior change in peers through education [16]. Not only are nursing students aware of peer practices, they may also be seen as having expertise in health promotion. Sponsoring a student-faculty collaborative research model to deliver educational campaigns supports leadership development while positively impacting the health of college campuses. The purpose of this evidence-based study was to implement multicomponent educational strategies on a residential college campus championed by a collaborative model to support a change in vaping behaviors and to reduce rates of e-cigarette use.

MATERIALS AND METHODS

Pre-Implementation Data

Undergraduate nursing student members of a student-faculty collaborative research team at a private, Mid-Western university completed a pre-implementation study to form a foundation for the multicomponent educational strategies. A mixed method design assessed students' awareness of vaping behaviors and perceptions of students across campus [7]. An investigator-developed survey was used to collect data and contained questions assessing demographic information and adapted questions to assess e-cigarette behaviors and intentions for change [2, 12]. Following IRB approval, SurveyMonkey® was used to distribute the questionnaire to a random, stratified sample of students by year in college (freshmen to seniors). SPSS 25 was used for data analysis.

Of the eligible randomly selected 800 students, 487 responded (61%). Eighteen percent vaped in the last 30 days; 19% did not want to stop; and 12.2% did not see vaping as a problem. Students in a fraternity or sorority (30%) used significantly more vaping devices than those not in Greek life (18%) ($X^2 = 6.344$, $p = .012$). Students vaped in social gatherings (72%) and with friends at their place of residence (60%). Focus group data supported several themes. Students perceived vaping "as safer" than smoking, it was cool in high school, easily accessible, and students were "generationally chill". Students believed their generation is less judgmental than previous generations meaning they were not likely to criticize those who smoke or vape and as a result would not call out the behavior.

AVOID Program

Following the baseline assessment, the team initiated the Anti-Vaping Ongoing Information Dissemination (AVOID) plan based on best evidence [4, 9-11, 13, 17]. Using the TTM as a change framework, strategies were developed to encourage movement from precontemplation to contemplation, and from contemplation to action. All students across campus were the recipients of messaging and education due to their increased likelihood to use a vaping device and failing to view themselves as "vapers" [4, 7]. These viewpoints provided an opportunity to influence social norms and present the cons of e-cigarette use as a foundation for behavior

change. Since the majority of students who reported vaping were unaware, they had a problem or were not thinking about quitting [7], strategies were employed to help students gain insight into their behaviors and the negative consequences of vaping. For example, one of the messages used in a variety of settings stated: "So you think vaping is safe, think again" and included negative health outcomes from using e-cigarettes.

Tailored cessation messaging and education strategies with Quitline information were provided across campus in many ways (a) three social media posts on Instagram; (b) tabling displays over several weeks in six academic campus buildings, including the student union, with free items such as stress balls, candy, and magnet clips; (c) public service announcements, distribution of educational materials, and stress balls at sporting events including football, volleyball, and soccer games; (d) campus TV messages in all buildings with electronic displays over several weeks; (e) coverage of issues related to vaping in a feature article in the university student newspaper; (f) Panhellenic education programs for fraternity and sorority houses; (g) a YouTube video; and (h) educational posters/pamphlets displayed in campus buildings over several weeks. All messaging interventions were distributed over a four-week period during the fall semester and were simple to create, available in at least one format to students on campus, and inexpensive to implement. Additionally, the team partnered with the local Tobacco Education and Prevention Coalition (TEPC) to secure educational and Quitline materials for campus. TEPC was organized with the support of Smokefree Indiana, the university, and a grant from the Indiana Tobacco Prevention and Cessation Commission. Partnering with the coalition allowed all groups to address the incidence of e-cigarette use and promote cessation activities, not only at the university but across the community where students interact.

Post-Implementation Data

Evaluation included surveys of students to determine the effectiveness of the AVOID multicomponent program and the number of students in the different stages of the TTM. The same investigator-developed survey from pre-implementation was used [2, 12]. Following IRB approval, SurveyMonkey® was used to distribute the questionnaires to a new random, stratified sample of students by year in college (freshmen to seniors). Post-implementation, 464/900 (52%) students responded. Rates and behaviors related to e-cigarette use were compared. SPSS 25 was used for data analysis.

RESULTS

Demographic characteristics of the respondents were similar pre- and post-implementation (see Table 1). Post-implementation, all students (100%) reported seeing at least one AVOID strategy, with posters (74.3%, $n = 345$) as the most viewed strategy followed by social media posts (40.5%, $n = 188$), tabling displays (24.5%, $n = 101$), campus TV messages (19.9%, $n = 82$), fraternity/sorority meetings (9.7%, $n = 40$), YouTube video (8.5%, $n = 35$), school newspaper article (8.0%, $n = 33$), and sporting event activities (7.8%, $n = 32$). Students who reported vaping in the last 30 days decreased from 18.1% pre-implementation to 15.8% post-implementation ($X^2(1) = .469$, $p = .494$). Reported TTM stages of change were significantly different following the multicomponent educational strategies ($X^2(5) = 26.408$, $p < .001$), with 61.5% planning to quit within the next 6 months compared to 33.3% pre-implementation (see Table 2).

Table 1: Demographic Percentages Pre- and Post-Implementation

	Pre-Implementation	Post-Implementation
Year in College		
Freshman	30.8	27.4
Sophomore	18.3	23.7
Junior	19.9	23.7
Senior	30.0	23.7
Other	1.0	1.5
Gender		
Female	59.6	66.4
Transgender Female	0.2	0.8
Male	37.3	31.4
Transgender Male	0.7	0.4
Gender Variant/Non-Conforming	2.2	1.0
Fraternity/Sorority Involvement		
Yes	22.9	28.7
No	77.1	71.3

Table 2: Vaping Behaviors by Percent according to TTM Pre- and Post-Implementation

Behavior	Pre-	Post-
Decided to stop vaping and I have a quit date in the next month	17.9	54.1
Planning to stop vaping within the next 6 months	15.4	7.4
Thinking about stopping vaping but I do not have a plan	12.8	3.9
Thinking of cutting down on vaping but I am not ready to stop	15.4	8.2
I know I shouldn't vape but do not want to stop now	23.1	7.8
I do not think vaping is a problem and I do not plan to quit	15.4	18.6

DISCUSSION

Colleges and universities are well positioned to address vaping behaviors and promote student health [9]. These institutions should ensure that messages and education for students are up to date, provide treatment resources, and encourage tobacco free policies that include e-cigarettes. The AVOID multicomponent strategies managed by an undergraduate student-faculty collaborative team provided evidence-based tailored messages [9, 10, 17] that provided positive results on campus and capitalized on the use of social media to best reach this population [9]. All students (100%) who responded were exposed to at least one strategy with posters and social media providing the most exposure. All strategies were cost-effective, simple to create, easily viewed, and sustainable social norm messages. While rates of vaping in the pre-implementation group (18.1%) were similar to national data (18%) [2], rates of vaping were lower post-implementation (15.8%) and compared to the most recent rates of vaping from the ACHA (21.1%) [2]. While the rate decrease was not statistically significant, any reported decrease in vaping behavior can be seen as positive for health. Higher rates of reported vaping may have been associated with other student characteristics such as the number of students who were members of fraternities and sororities [7].

Findings suggested the multicomponent strategies resulted in an increase in the number of students in later TTM stages of change. The percent of students who reported a quit date within

the next month and those planning to stop within the next six months increased significantly from pre- to post-implementation. The TTM is an effective behavioral framework to reduce e-cigarette use in college students [5, 12]. It is important to have a better understanding of student vaping behaviors and their perceived stages of change. Knowing “where students are in the stages of change can help to inform behavioral message campaigns enabling more focused targeting of messages and efforts to reduce consumption” (p.1) [5]. While causation cannot be determined based on the design, students who participated in both surveys were selected through random, stratified sampling, were similar, and representative of students on the campus.

This study also supports the need to integrate strategies that universities use to maintain ongoing e-cigarette interventions. Collaboration among student groups and student life offices should maintain yearly programs to educate and support vaping and smoking cessation across campuses. Having peers, such as nursing or other health profession majors, provide tailored education enhances the credibility of the intervention and may lead to greater student buy-in to messaging. Working with a tobacco prevention coalition could further support each group’s mission and the ability to form a realistic multicomponent plan. Efforts are needed to update campus policies beyond tobacco-free statements. Universities need to actively create campaigns for changing social norms and to promote further cessation activities, such as working closely with student health offices on campus to integrate vaping assessments and cessation resources for all students who come for services.

Limitations

Data were not matched or tracked per student pre- and post-implementation, and data do not imply causal relationships. Data were collected on one campus and may not reflect other campuses. Since responses were self-reported, students may have held biases and not reported their true behaviors or intentions. Additionally, since vaping behaviors were not confirmed for students who reported their TTM stages of change, it is not known whether these students actually changed their vaping behaviors based on the AVOID program or had already decided to change their e-cigarette use. However, addressing behavior change through social norm message campaigns more realistically reached the majority of students who vape, is cost effective as compared to attempting one-on-one quit strategies, and does not rely on students having to seek out and self-identify as “vapers”.

Pre-implementation data for this study were collected immediately prior to the COVID-19 pandemic and post-implementation data after the pandemic began. Many factors that students encountered during the pandemic have led to negative effects on their mental health and behaviors [18, 19]. While there is lack of evidence on increased vaping because of the pandemic in a national sample of young adults, there is evidence that self-reported vaping increased for current nicotine dependence [19]. To manage their negative emotions, college students may have used unhealthy coping strategies for pandemic-related stressors.

CONCLUSIONS

Involving undergraduate nursing students in a student-faculty collaborative model provided experiential learning about implementing best practice opportunities and made a positive impact on a campus and the health of their peers. The team worked effectively to develop multicomponent educational strategies to promote vaping cessation that can easily be

sustained and updated on campus. Educational initiatives such as the AVOID program should continue on college campuses. Knowledge is the foundation to behavior change. Campus representatives should develop tailored messaging to inform college students who vape and those who might begin the behavior about the negative effects. Interventions to help move college students from precontemplation to contemplation and even to action must be directed towards undergraduate student vaping behaviors. Now more than ever, a change needs to occur, and it all starts with informing college students on the unspoken consequences of vaping.

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