

Master of Public Health
Integrative Learning Experience Report

*Increasing awareness of the dangers of vaping for
students at Rossville Junior/Senior High School*

By

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MASTER OF PUBLIC HEALTH

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Abstract

Teen vaping has increased steadily for many years, quickly rising to epidemic levels. Products are becoming more readily available and being marketed to school-aged kids. The need for education on the dangers of vaping has never been greater. This project addressed the struggles with vaping at Rossville Junior/Senior High School in Rossville, Kansas. A needs assessment was completed as a self-reported survey to determine the extent of interventions needed at this school. Concurrently, an anti-vaping campaign was launched at an all-school assembly. The goal of the assembly was to reach a large number of students with accurate information regarding the dangers of vaping. Following the assembly, student volunteers created educational posters to reinforce the dangers of vaping. Additionally, metal signs from the Kansas Department of Health and Environment will be ordered and later posted throughout the school in strategic areas. The current school policy regarding vaping was reviewed, and a new policy was proposed (to administrators) to address its deficiencies. The new proposed policy is more universal in scope, removing clauses that were open to interpretation by different school clubs and teams. In addition, an interactive educational product was created for the school. It was designed to be used as a remediation tool for students who violate the new policy prior to being readmitted to school from their consequence. All components of the anti-vaping campaign will be permanent integrations at Rossville Junior/Senior High School. A future goal is to expand the anti-vaping campaign to include more students who expressed interest in helping. Positive student involvement is critical in reaching at-risk students.

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Chapter 1 - Literature Review

Introduction

As a scholarly reflection on my field experience (documented in my separate Applied Practice Experience, or APE, report), I explored and have documented below some insights on vaping as a historical and contemporary public health problem. While not comprehensive, this literature review augmented my understanding of the challenges of behavior modification—one of the grand challenges of public health.

Vaping History and Evolution

Electric cigarettes have been around since the 19th century. Figure 1-1 shows an advertisement from an 1887 issue of *Harper's Weekly*. The image, depicting Dr. Scott's Electric Cigarettes, promotes a product that is “exceedingly convenient” as it requires no match to light (Advertisement, 1887). It also promised buyers that “no nicotine can be taken into the system while smoking them” because of a cotton filter that has been placed in the cigarette (Advertisement, 1887).

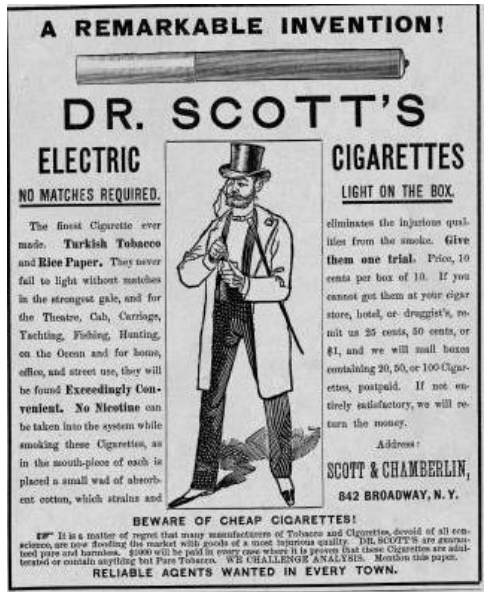


Figure 1-1 Dr. Scott's Electronic Cigarette. Source: Harper's Weekly, 1887.

Electronic cigarette use, known as vaping, has been marketed as a safer alternative to traditional smoking since it first appeared on the market. While the first patent for electronic cigarettes was submitted in the United States in 1963, they were not widely marketed or used for several more decades (U.S. Department of Health and Human Services, 2016). They did not become popular in the United States as a smoking alternative until 2007 (Dinardo & Rome, 2019). As electronic cigarettes have increased in popularity, they have also become more readily available and in a variety of shapes and sizes. There are currently more than 460 brands of electronic cigarettes available for purchase (National Institute on Drug Abuse, 2020). Figure 1-2 illustrates some of the current electronic cigarette devices. These current devices use a liquid product that is heated and converted to aerosol form. The liquids commonly contain nicotine and other additives (U.S. Department of Health and Human Services, 2016).

Because they were introduced as a safer alternative to smoking, they are frequently marketed as a smoking cessation tool.



Figure 1-2 Various Electronic Cigarette Devices. Source: Photo by Mandie Mills, CDC.

Dangers of Vaping

Although vaping was historically viewed as a safer alternative to smoking, recent studies demonstrate that it has its own potential dangers. One danger ensues because of the chemicals in the vaping liquids. Although the chemicals vary between each liquid, some that have been included are nicotine, propylene glycol, acetaldehyde, formaldehyde, diethylene glycol, heavy metals, cadmium, and benzene (American Lung Association, 2020). All of these chemicals are toxic and have been shown to cause a wide array of health problems on their own, such as popcorn lung, lung damage, breathing problems, and cancer (American Lung Association, 2020).

Of particular concern is nicotine. Nicotine is an extremely addictive drug with effects directly on the brain (U.S. Department of Health and Human Services, 2010). Since teens do not yet have fully developed brains, nicotine can cause long term deficits in memory, attention, and learning (American Lung Association, 2020). It is believed to be “as addictive as heroin, cocaine, or alcohol” and can make users more susceptible to using additional types of drugs (American Lung Association, 2020). It is this addiction and its unique profile as a “gateway drug” (i.e. leads to additional drugs) that is especially concerning and an increasing public health concern. Using nicotine in electronic cigarettes can lead to addiction, making it even more difficult for users to quit. Vaping liquids are sold with varying concentrations of nicotine, typically labelled quantitatively in incremental steps from 0 mg/ml to 30 mg/ml, while some containers are simply labeled with qualitative labels such as low, medium, high, or super high (National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice; Committee on the Review of

the Health Effects of Electronic Nicotine Delivery Systems, 2018). Despite misleading labeling, the amount of nicotine actually contained in the containers can vary, with some even higher than advertised. Some liquids claiming 0 mg/ml of nicotine were shown to have nicotine upon chemical analysis (National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice; Committee on the Review of the Health Effects of Electronic Nicotine Delivery Systems, 2018). These labelling errors are problematic; they could mislead individuals trying to quit smoking and unwittingly consuming nicotine, thereby perpetuating or reviving addiction in those trying to quit vaping or smoking.

In addition to nicotine and the previously mentioned toxic chemicals, tetrahydrocannabinol (THC) is another harmful substance that is added to some vaping liquids. THC is the component of marijuana that provides a psychoactive effect (Fletcher, 2019). This effect can be magnified in teenagers, as their brain is still developing (Fletcher, 2019). As shown in Figure 1-3, a large percentage of cases contain either nicotine or THC, or sometimes both (Krishnasamy, et al., 2020).

| Substances used in e-cigarette, or vaping, products (2,022) ¶,*** | |
|---|------------|
| Any THC-containing product | 1,650 (82) |
| Any nicotine-containing product | 1,162 (57) |
| Both THC- and nicotine-containing product use | 834 (41) |
| Exclusive THC-containing product use | 669 (33) |
| Exclusive nicotine-containing product use | 274 (14) |
| No THC- or nicotine-containing product use reported | 44 (2) |

Figure 1-3 Substances used by EVALI patients who reported vaping in the 3 months preceding symptom onset. Source: (Krishnasamy, et al., 2020).

During the summer of 2019, the CDC, the FDA, state and local health departments, and others discovered an outbreak of cases that they named e-cigarette or vaping product use-associated lung injury, or EVALI; this outbreak was not an infectious disease outbreak in the traditional sense (Centers for Disease Control and Prevention). Between August 2019 and January 2020, over 2600 cases of EVALI were reported to the Centers for Disease Control and Prevention (CDC) after appearing in emergency rooms across the United States (Krishnasamy, et al., 2020). Most cases were reported between August and September of 2019. Kansas reported 24 cases requiring hospitalization, with two deaths from EVALI (Kansas Department of Health and Environment). Active surveillance revealed that 82% of EVALI patients during this time reported using THC-containing vape products (Krishnasamy, et al., 2020). Because of the strong association between EVALI and patients using the THC-

containing liquids, these products were examined as a potential cause. Vitamin E acetate emerged as a possible causative agent, or exacerbating agent, in EVALI illnesses, as it was found in fluids from 94% of EVALI patients from 16 different states, while not found in any healthy patients of the sample group (Blount, et al., 2020). Vitamin E acetate is added to vaping liquid with THC as an additive (Krishnasamy, et al., 2020). The mechanism for causing illness from Vitamin E acetate has not been positively identified; however, the prevailing theory is that it affects respiration in the lungs by interrupting the maintenance of surface tension (Blount, et al., 2020). While not definitively linked as a causative agent, warnings have been issued against using vaping liquids that contain THC and Vitamin E acetate.

Vaping Appeal

Vaping has become an epidemic among teenagers. In 2019, over 5 million middle and high school students used electronic cigarettes, with close to 1 million of those students using them daily (U.S. Food and Drug Administration, 2020). One draw for teens is the variety of vaping liquids available; the vaping liquids that are used in electronic cigarettes are available in many fruity and minty flavors. Not surprisingly, as many as 78% of teenagers attributed the flavors to their use of electronic cigarettes (Baker, et al., 2019). The perceived safety of vaping, combined with the enticing flavors, makes vaping a popular option for some middle school and high school students.

In addition to the variety of flavors, electronic cigarette devices have become increasingly similar in appearance to everyday objects that students carry, such as flash drives and pens. This is appealing to students because they can carry them openly

without causing suspicion from teachers or parents. Between the variety of flavors and easily disguised cartridges, vaping is increasingly marketed to teenagers and young adults. The FDA took steps to reverse this appeal with a 2020 ban on minty, fruity, and dessert flavored cartridges; however this ban did not apply to open tank devices or menthol flavor, which could become substitutes (Radcliffe, 2020).

The Acquisition of Vaping Products by Youth

Ironically, the in-school environment is highly influential on the vaping activities of the students in attendance. A North Carolina survey overwhelmingly revealed that middle school and high school students are most likely to obtain vaping products from friends, with 51.5% of the survey respondents choosing this option (Baker, et al., 2019). Numerous studies have shown that schools with high levels of vaping incidences are more likely to have low-risk students begin this new habit (Lippert, 2019). One explanation for this is that the vaping devices are more readily available. Additionally, one study of adolescents and young adults discovered that as many as one-third began using vaping devices as a result of having at least one friend that used them (Lippert, 2019). Students who own or have access to a vaping device frequently share with their classmates. This gives a low-risk student who would not have purchased a device on their own the ability to try vaping without having to make an investment. By sharing their device, a high-risk student opens the door to vaping for low-risk students.

Tobacco 21 (T21) is a federal bill that was signed in December 2019 to compel states to raise the legal age for purchasing tobacco products from 18 to 21 (Preventing

Tobacco Addiction Foundation, 2020). Many states enforced this age prior to the passing of Tobacco 21. However, some states still lag behind, including the state of Kansas. Kansas is one of 29 states that do not yet have a statewide law; however, certain counties and cities, as shown in Figure 1-4 and 1-5, are paving the way for Kansas to eventually adopt a statewide law (Preventing Tobacco Addiction Foundation, 2020). This is a step in the right direction for the state of Kansas and the remainder of our country.

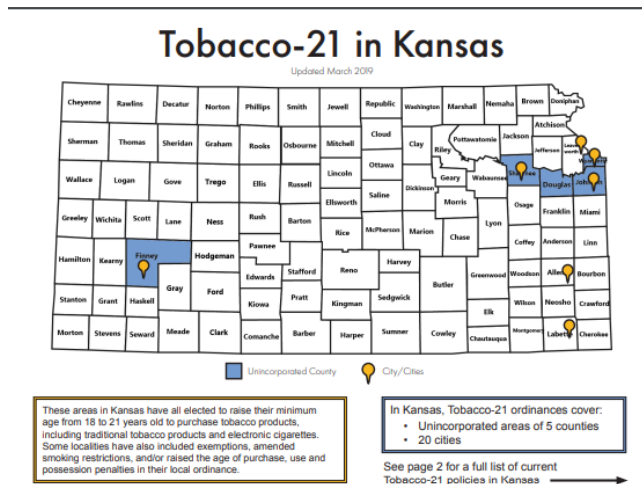


Figure 1-4 Cities and Counties in Kansas that have enacted Tobacco 21

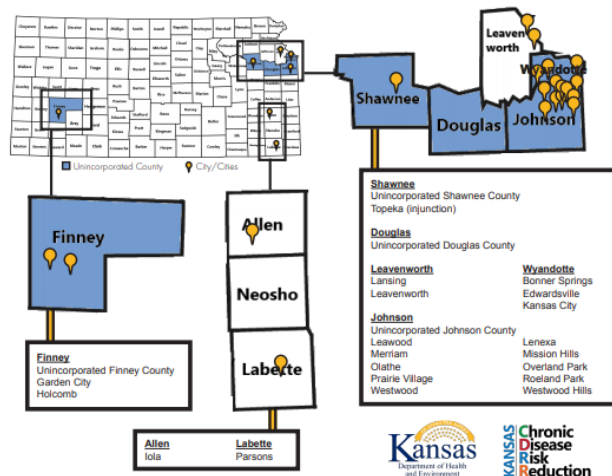


Figure 1-5 Kansas cities that have enacted Tobacco 21

Importance of an Anti-Vaping Campaign in Schools

Vaping is more common in schools with ineffective policies and practices that fail to properly address electronic cigarette use. Schools that practice celebrating academic success and reinforcing the norm that vaping is dangerous are less likely to have high incidences of students who vape (Lippert, 2019). Conversely, schools that do not practice this have higher numbers of students who vape. In addition, the students at the higher risk schools are also less likely to realize the dangers of using electronic cigarette products (Lippert, 2019). With students in school eight hours per day, schools are in a unique position to provide education to students about the dangers of vaping. With the alarming numbers of teens who vape in our country, intervention is essential for their health.

Chapter 2 – Project Description

Background and Objectives

In July 2016, I attended a one-week professional development in Washington, D.C. to expand my knowledge of food science. This program was developed by the Center for Food Safety and Applied Nutrition (CFSAN), a branch of the Food and Drug Administration (FDA). While in attendance, I enjoyed many exclusive experiences. I attended intensive microbiology training at the University of Maryland to further my techniques of isolating and identifying microorganisms. While touring the United States Department of Agriculture (USDA) dairy, poultry, and beef farms, as shown in Figure 2-1, I saw first-hand the processes involved with food inspections.



Figure 2-1 Entrance to a USDA property

In addition, I was amazed by the strength of security provided at each area that handled food. I spoke with scientists who narrated the process imported food must adhere to

prior to entry into the United States. Figure 2-2 is an example of one presentation inside of the USDA facilities.

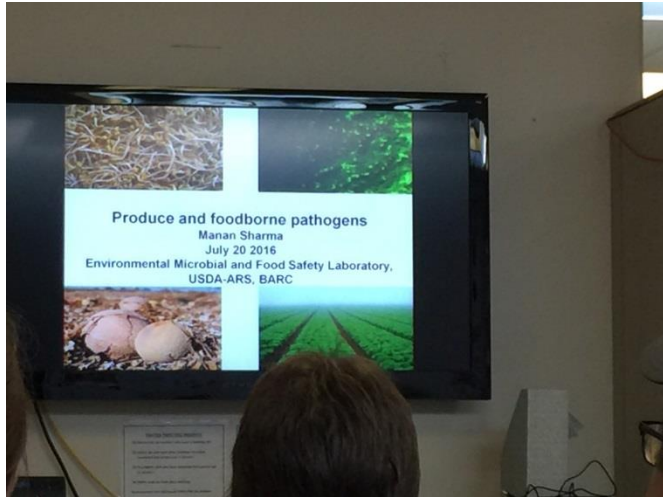


Figure 2-2 USDA Presentation on Food Safety

The final experience was a tour of the CFSAN facilities. I was shown how to use machines I had only heard of, including one that sequenced the genome of foodborne pathogens from contaminated foods when cases came in, as shown in Figure 2-3. I was also given explanations of the various products regulated by each division of the FDA, including electronic cigarette products. This trip was in the midst of the increased popularity of vaping and the FDA was finalizing a rule extending their regulation of tobacco products to include vaping

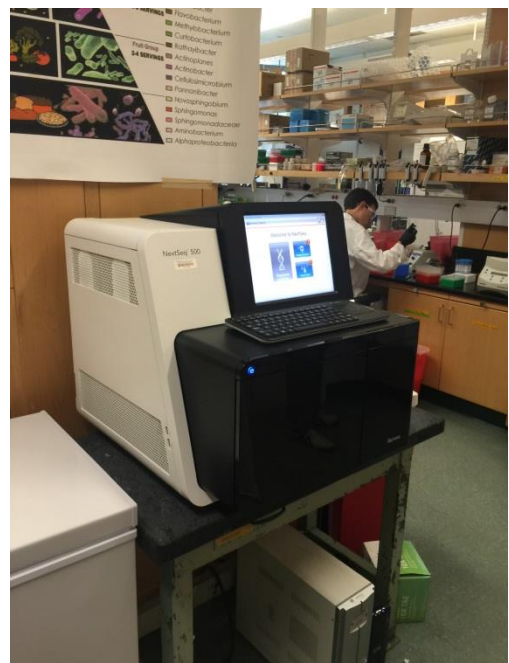


Figure 2-3 Gene Sequencer at CFSAN Lab

devices. My experiences on this entire trip reinforced my interest in food science and biosecurity. My experiences at CFSAN enhanced my interest in the emerging vaping epidemic.

As a life-long non-smoker, I was unfamiliar with electronic cigarettes. When vaping first began to emerge at RJSHS, our principal held a staff meeting (circa early 2018) to educate us on how to evaluate and address the scope of the problem. In this staff meeting, I was briefly introduced to what the devices looked like so that I would be aware of what to look for. I was also informed that the devices held a liquid that could often be identified by the smells produced during the vaping process. When school resumed the following fall (2018), there was yet another in-service to educate staff. This in-service was much more informative and explained some of the chemicals in the vaping liquids. I also learned that while data was just starting to emerge, the dangers of vaping were being underestimated. However, this was the extent of my education and knowledge of electronic cigarettes. During the school year (2018-2019), vaping at RJSHS increased at alarming rates. Students were caught vaping in the bathroom, on school trips, at sporting events, and even in the middle of class. As a teacher and a parent, this was alarming to me.

In the fall of 2019, I returned to RJSHS with the conviction that RJSHS likely had a significant need for an anti-vaping campaign, and I later informed Dr. Kastner that I would like to investigate it in my Applied Practice Experience (APE). For a timeline of my project starting in early 2020, see Appendix A of my APE report. The school nurse and I established specific objectives for this project. First, I needed to truly educate myself on the many types of electronic cigarette devices and how they work, as well as

the chemical contents of the various vaping liquids and the effect that they have on our bodies. Next, I needed to learn about the laws related to vaping, particularly how they related to middle school and high school students. Finally, I needed to gather data to better understand the vaping problem at RJSHS before I could begin the process of creating an anti-vaping campaign to combat the problem.

Pre-Intervention Survey

A variety of portfolio products were needed to address the broad range of students that are represented in our building, as well as faculty and staff. To meet this need, I began with a pre-intervention survey. This survey was designed to obtain both qualitative and quantitative data from our school population. It contained 15 questions regarding topics such as the perception of the level of danger, personal involvement using electronic cigarettes, and demographic data questions designed to help me understand which groups were most involved in the process. The survey was reviewed and approved by the school principal as well as my preceptor. The survey, designed in Google Forms, was sent out February 19, 2020 to the entire grade 7-12 student body of RJSHS, as well as all faculty and staff. Approximately 275 individuals received the survey through their school email inbox. Of the 275 people that received the survey, 187 responded. This represents a 68% response rate. While many students and staff members failed to respond, this is to be expected in a self-reporting survey of counter normative behavior (Brenner & DeLamater, 2016). The survey was anonymous; this was clearly indicated to the students in the email introduction to the survey and at the

beginning of the survey itself. Survey questions and responses are shown in Appendix B.

Upon evaluating the pre-intervention survey with my preceptor, it was determined there was a need for behavior-change inducing intervention strategies in our school. Admittedly, the survey did not reveal as much of a need as I initially thought it would; however, this was likely due to understandable reluctance or fear of punishment. First, asking junior high and high school kids to admit in a survey that they vape depends upon them telling the truth. It is possible that, although I stated that the survey was anonymous and did not collect their email addresses, the respondents still had reservations about admitting this habit in a survey conducted by one of their teachers. Second, the students most at risk may have elected to not complete the survey altogether once they saw what it was about; indeed, this challenge is often faced in surveys of sensitive or embarrassing personal behavior (Brenner & DeLamater, 2016). While the student numbers were lower than I expected, they were similar to vaping trends shown in national data. During the process of the survey, I did have some faculty members personally ask me the reason for the survey, as they were also slightly hesitant to reveal their personal behavioral information. I explained the project and the need for accurate data to determine the educational components that would be necessary to help our school population. Other factors that need to be taken into consideration regarding the survey numbers are the number of students that were caught vaping throughout this school year and subsequently received punishment. The first semester of the 2019-2020 school year identified four separate students caught vaping in school on at least one occasion, all of whom were boys. The self-reported

survey results identified only two males willing to admit vaping. Thus at least two individuals did not give honest responses in the survey. Typically in a school, numbers will decrease slightly after such offenses, as students are aware that faculty and staff have a heightened awareness. They also have a perception that we are looking for vaping devices. Recent legislation that increased the age of purchasing the devices from 18 to 21 might also have impacted this number, as the devices might be harder to obtain. Finally, a recent ban of the appealing flavors that attracted so many students to vaping might have also caused a true decrease in vaping incidences. The pre-intervention survey was a valuable tool for information for this project. It helped identify locations of concern in the school that students use for vaping, as well as misconceptions among the students regarding the dangers of vaping.

The results of the survey indicated that we did have a need for education about vaping in our school. Rossville Junior/Senior High School is a small sized 2A (schools with 109-171 enrolled high school students) school northwest of Topeka. With only approximately 225 students in grades 7-12, it does not take many students pursuing this habit before it begins to spread quickly throughout the community. There was also a misconception that emerged in the survey data. According to their responses, it seems many students believe that vaping is not dangerous at all, or is less dangerous than smoking. This is not surprising according to the 2018 National Youth Tobacco Survey, which states that 17.1% of the respondents listed the belief of vaping being safer than smoking as the reason they began their vaping habit (U.S. Food and Drug Administration). This was valuable information for me moving forward with my portfolio products, as this guided me toward specific areas to focus on for the students.

All-School Assembly

Following the survey, RJSHS had an all-school assembly during which the Shawnee County Health Department gave a presentation regarding the dangers of vaping. All students and staff at school on February 20 attended the assembly, as shown in Figure 1. This assembly was arranged as a way to dispute inaccurate information that students believed to be true as well as to educate them on what actually physiologically happens to their bodies when they vape. A Health Promotion Specialist from Shawnee County

presented a twenty-minute slide presentation that gave information on the dangers of vaping. The presentation included information on the contents of vaping liquids and how they damage the lungs. In addition, it covered statistics on vaping as well as statistics that were relevant to the students, such as what they could alternatively buy with the money they potentially spent on

vaping throughout the years. This part of the presentation went well, as the products that were presented were items that were popular with students. My preceptor and I noticed that students were more attentive and engaged when they heard of these alternatives. Hearing that they could buy a new gaming system or popular shoes with the money they would save from not vaping, as opposed to hearing a speaker just tell



Figure 1-4: All-School Assembly on February 20, 2020 at RJSHS

them the dangers of vaping, seemed to grab their attention. According to a report published by the World Health Organization, cost is attributed as a motivational reason for tobacco cessation for all ages of smokers (Department of Mental Health and Substance Dependence, 2001). Therefore, this kind of a presentation can be effective for students because it appeals to positive alternative behavior. Following the presentation, the speaker answered questions. Many questions were asked of the speaker, including questions relating to the health effects, clarification of the current laws, and whether vaping was more dangerous than smoking. Additionally, the school nurse asked guiding questions that she felt the students might need to know, such as lack of research on long term health effects. The students were attentive and engaged with this presentation. It was an ideal response to the pre-intervention survey and addressed the main area of concern from the survey results.

Literature and Posters

Following the assembly, my next portfolio project was to inundate the school walls with literature and posters to reinforce the concepts discussed in the assembly. In the pre-intervention survey, I included a question allowing for students to give their name and contact information if they would like to be included in efforts to help educate their peers against the dangers of vaping. I received a total of 19 responses from students volunteering to be included in these efforts. I am the sponsor of the RJSHS Chapter of SADD, which is short for Students Against Destructive Decisions. It was my intention to integrate the student volunteers into my SADD group, if they were not

already a member. Combining my MPH field experience efforts with my SADD chapter activities would give me additional resources and events to further the educational efforts, such as Red Ribbon week. Red Ribbon week is an anti-drug and alcohol campaign condensed into one week each October. However, at the beginning of March, the novel Coronavirus 19 pandemic became more widespread in the United States. While on Spring Break, students and staff of any school in Shawnee County were notified that they would not be returning to school after Spring Break and were, in fact, moving to online learning for the remainder of the school year. With this unforeseen event interrupting the school year, the posters were unable to be distributed completely throughout the entire school. Additionally, the students will not receive the benefits of them until Shawnee County schools are potentially allowed to resume for the 2020-2021 school year. However, although not an immediate benefit, the educational posters will still be hung up for the next school year as a continuing intervention strategy. In addition to the posters created by the students, I will receive pre-printed metal signs from the Kansas Vape-Free Schools Toolkit, which is distributed by the Kansas Department of Health and Environment (KDHE), as shown in Appendix C. An example of a poster created by a student, as well as a picture of the metal signs distributed by KDHE can be seen in Appendix C. Once I upload our new policy, the signs will be sent to our school.

Policy Proposal

One issue contributing to the vaping problem at our school is the lack of an

effective centralized policy. Tobacco policies are the responsibility of the school district. The RJSHS student handbook states,

“Possession and/or use of tobacco products by students are prohibited in any attendance center, in any school-owned vehicle, at school-sponsored events or on school grounds. E-cigarettes and related products are considered tobacco products in this policy” (Kaw Valley School District, 2020).

The handbook then details the policy based on the number of offenses the student has. For the first offense, the student is required to serve two days of in-school suspension (ISS). This involves doing homework in a conference room with no electronics or other students. At this time, parents would be notified, but would not be required to visit the school for a meeting with the principal. Additionally, it is up to administration to decide whether to report the offense to law enforcement. If the student commits a second offense, they receive a consequence of three days suspension to be served out of school (OSS). The student is still allowed to receive credit for homework, but is not allowed on school property for classes or any school activities. In addition to the OSS, administration will report the offense to law enforcement. If a third offense occurs, the consequence is again an instance of OSS. However, the length of time is extended to five days. Law enforcement is again called. This offense also requires a parent to attend a meeting with the principal.

While the general policy is mostly straightforward, it is not always followed and is deficient in significant areas. A specific strength of the current policy is that it addresses all tobacco products and includes electronic cigarettes in this category. This part of the

policy will be retained in the new policy proposal. Although not entirely poorly written, the current policy does have some loopholes that need to be addressed. Specifically, all students need to be treated equally. Some of the teams at RJSHS have their own policies regarding vaping that are stricter, resulting in students being removed from the sporting team. This sends a very clear message to students that athletes and/or team competitors are representatives of the school and held to high standards. However, some teams do not have a policy in place and have had repeat offenders. This discrepancy lends itself to a system that is open for argument and interpretation, with the final result often being no repercussions at all; in addition, it raises questions about inequity of consequence administration. To illustrate this point, a basketball player with one offense might be removed from the team while a football player on his third offense might still be allowed to play. Therefore, although there is a general policy, the policy needs to also address *all teams* instead of letting them each have their own policy. This would eliminate the need for interpretation and would remove any room for objections or loopholes. Additionally, the current policy does not address faculty, staff, and visitors. It is imperative to have the entire population of RJSHS represented in the new policy.

Based on this information, I drafted a new policy to propose to building administration. For the new policy, the offenses are still categorized into first, second, and third offenses. The suspensions also remained the same. However, the wording is more definitive in the new policy proposal, leaving less room for ambiguity. Faculty, staff, and visitors are encompassed in the new policy as well. I also included provisions for announcing the new policy to the public, as well as posting the policy in common public areas. The full policy proposal is shown in the Appendix E. This policy will be

proposed to our building administrator, who is our high school principal. If he wishes to pursue this policy, I would present the policy to our district superintendent. Following the superintendent's approval, I would present the new policy to the USD 321 Board of Education for approval.

One challenge of the new policy will be acceptance by all faculty and staff. While many teachers find it difficult to manage the vaping issues within their classrooms, they are required to follow the policy and would likely be in favor of a universal policy to help them. However, coaches and sponsors of extra-curricular activities might be less receptive. A universal policy would eliminate the ability of coaches and sponsors to use judgement calls as a method of handling vaping offenses of their participants. If a student is caught vaping that is an integral part of the team or activity, the coach and sponsor would be required to either suspend or dismiss the player, thus potentially affecting the outcome of the activities they were participating in. Although support of coaches and sponsors might be more difficult to obtain, the policy will still be required to be followed if approved.

Remediation Program

My final portfolio product is an interactive multimedia creation designed to help remediate the problem and would be used by students during their suspension time, prior to returning to school. This tobacco and nicotine educational element requires the student to work through an interactive program. This program was created in Google Slides, with Pear Deck as an add-on component to create the interactive portion of the

program I chose this format because RJSHS is an all-Google school, with Google Certified Educators. As they progress through the program, they will encounter short, informative videos that require them to write a brief reflective summary of what they learned. The program also has periodic questions that are designed to check the understanding of the student regarding the dangers of vaping. Once the program is complete, their completion status is sent directly to the school principal. Once the principal receives the notification that the student has completed their remediation, they will be allowed to return to school. While the remediation content does not change, it is added to every level of the proposed school policy. If a student continues to abuse the policy, they will complete the program more than once. However, future considerations might be to add different levels of remediation products depending on the number of violations the student has had. Different approaches to information, such as having the student research the dangers of vaping, might have a better effect on the student. This will need to be evaluated after the first year of use to determine the effectiveness of the product and assess the need for change. Multiple offenses by the same student who completes the program would be an indicator of the effectiveness of the remediation program.

Chapter 3 – Competencies Addressed by Coursework and Field Experience

Student Attainment of MPH Foundational Competencies

Competency Two

The first competency is number two, which demonstrates the ability to “select quantitative and qualitative data collection methods appropriate for a given public health context” (Kansas State University, 2020). Mastery of this competency is demonstrated in the pre-intervention survey that was sent to students and staff on February 19th. Analysis of the survey results generated much quantitative data, such as the ages of students who vape. Additionally, the charts showing the vaping frequency of both the students and staff provide quantitative data. Qualitative data is also demonstrated on the survey by asking the students their perceptions on whether vaping is more dangerous than smoking. Similarly, a question was included as to why the participant started vaping. This information is equally as important, as it could give public health professionals a point at which to start interventions. The qualitative and quantitative questions that were asked in the pre-intervention survey are effective methods to evaluate this public health situation.

Competency Four

Competency number four is the next competency that was demonstrated during the field experience. The skills addressed by this competency are to “interpret results of data analysis for public health research, policy or practice” (Kansas State University,

2020). The data generated in the pre-intervention survey also fulfills this competency. Figure 3-1 and 3-2 show some examples of the survey data analysis. The new school policy was created using the student and faculty responses. Additionally, the locations of poster placement were chosen from the survey data regarding school areas that students use to vape. Finally, perception on the dangers of vaping guided the information used in the remediation product. More data was obtained to be analyzed for future additions to the anti-vaping campaign. One example to pursue is the data regarding the strength of the vaping liquid. Analysis of this on a larger scale might help researchers to focus on which area had the most critical need. For this project, analysis of this data helped to identify the needs of the school in regards to the entire anti-vaping campaign.

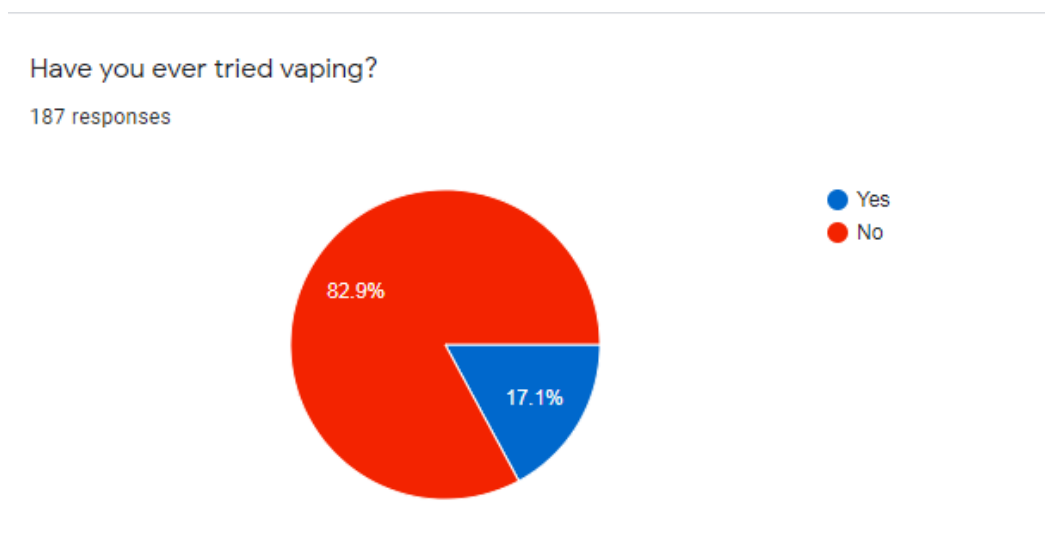


Figure 3-1 Data of Number of Students that Vape from Pre-Intervention Survey

If yes, how often do you vape?

11 responses

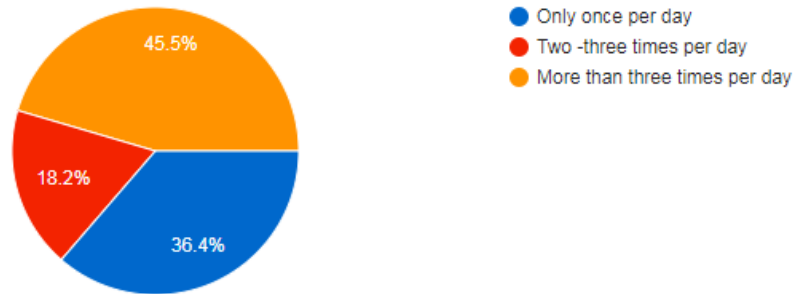


Figure 3-2 Frequency of Vaping at RJSHS

Competency Seven

Further analysis of the pre-intervention survey aided in the direction of the interactive multimedia product designed for remediation. This demonstrates mastery of competency number seven, which states that public health students will “assess population needs, assets and capacities that affect communities’ health” (Kansas State University, 2020). A remediation product would have been ineffective without knowing the reasons that kids started vaping or their thoughts on the dangers of vaping. Additionally, knowing that so many students have never tried vaping and are willing to help educate their peers is a true asset at RJSHS. This information was valuable in guiding me as to what information to include in this product and making it a relevant and valuable resource for both the school and the students.

Competency Nine

Competency number nine addresses the students' ability to "design a population-based policy, program, project or intervention" (Kansas State University, 2020). The universal policy, as shown in Appendix E of my APE report, which is to be proposed to the RJSHS Administration, reflects this competency. The new policy advocates for a less ambiguous wording that addresses all students, which is needed as a method to curb vaping incidences in the school. It also extends the reach of the policy by requiring visual and auditory reminders of the policy, such as posters and announcements at school events.

Competency Nineteen

Finally, I created several types of products to accomplish the anti-vaping campaign that would be ideal for the variety of ages that are seen in a single-building junior/senior high school. This applies to competency number nineteen, which states that students should "communicate audience-appropriate public health content, both in writing and through oral presentation" (Kansas State University, 2020). The oral presentation was accomplished through the all-school assembly presented by the Shawnee County Health Department, while the remainders of the products were accomplished in writing. All products were directed at the population of RJSHS.

Table 3-1 Summary of MPH Foundational Competencies addressed in APE and Demonstrated in Specific Products

| Number and Competency | | Field Experience Activity or Product |
|-----------------------|---|--|
| 2 | Select quantitative and qualitative data collection methods appropriate for a given public health context | A pre-intervention survey was administered to students and staff of RJSHS to determine the needs of the school. See APE Appendix B. |
| 4 | Interpret results of data analysis for public health research, policy or practice | Analysis of the pre-intervention survey result helped to determine the focus areas of concern to aid in directing the policy proposal. |
| 7 | Assess population needs, assets and capacities that affect communities' health | Analysis of the pre-intervention survey result helped to determine the focus areas of concern to aid in directing the remediation component. See Appendix D of APE. |
| 9 | Design a population-based policy, program, project or intervention | A policy was designed based on the pre-intervention survey to propose to the administration of RJSHS. See APE Appendix E. |
| 19 | Communicate audience-appropriate public health content, both in writing and through oral presentation | Considering the audience of junior high students, high school students, and staff, the educational and remediation components included written and oral components as well as an oral presentation to begin this campaign. |

Student Attainment of MPH Emphasis Area Competencies

The courses taken throughout my plan of study prepared me for the required competencies of the MPH degree. The five core classes provided the foundational education and introduced me to the many different facets that public health covers. Additionally, five Food Safety and Biosecurity competencies were met through the remainder of my coursework. Table 3-2 lists the FSB emphasis area competencies and their descriptions.

Table 3-2 Summary of MPH Emphasis Area Competencies

| FSB Emphasis Area Competency | | Description of Competency |
|-------------------------------------|---|---|
| 1 | Food safety and biosecurity | Evaluate solutions appropriate for different food safety, biosecurity, and defense issues in the food production continuum. |
| 2 | Threats to the food system | Examine specific threats to the food system and scientifically investigate how each can be prevented, controlled, and/or mitigated in the food production system. |
| 3 | Food safety laws and regulations | Differentiate key U.S. food safety regulatory bodies and their unique legislative authorities, missions, and jurisdictions. |
| 4 | Food safety policy and the global food system | Analyze and distinguish how food safety and governmental biosecurity policies, globalization, and international trade cooperation influence public health. |
| 5 | Multidisciplinary leadership | Contrast the food safety and biosecurity technical needs of different stakeholders and make judgements as to the appropriate methods of collaboration. |

Competency One - Food Safety and Biosecurity

Food Safety and Biosecurity is addressed in competency one. This competency requires students to “evaluate solutions appropriate for different food safety, biosecurity, and defense issues in the food production continuum” (Kansas State University MPH Program, 2019). While addressed throughout my graduate education, Dr. Nutsch specifically addressed these concepts in her FDSCI 730 and FDSCI 731 classes. Dr. Nutsch guided me through an epidemiologic case study of foodborne illness to experience the transmission of foodborne pathogens. During this experience, I had the chance to view models of how quickly the illness could spread throughout the country as food is distributed to different locations. I considered options that could be taken to attempt to remedy the situation. In addition, I examined numerous examples of foodborne illness caused by adulterated food in examples of bioterrorism and discussed ways to secure our food supply. Although my field experience focused on a non-food safety issue, many of the same public health and epidemiological themes appeared in the vaping public health threat.

Competency Two - Threats to the Food System

Competency two was also addressed in Dr. Nutsch’s FDSCI 730 and FDSCI 731 courses. Through both courses, Dr. Nutsch helped me to “examine specific threats to the food system and scientifically investigate how each can be prevented, controlled, and/or mitigated in the food production system” as specified in competency two (Kansas State University MPH Program, 2019). As explained in the literature review of this report, manufacturing of vaping products and erroneous labeling of those products create threats not dissimilar to dangerous food products.

Competency Three - Food Safety Laws and Regulations

Dr. Kastner's DMP 816 course, Trade and Agricultural Health, best demonstrated the concepts in competency three. Competency three requires students to "differentiate key U.S. food safety regulatory bodies and their unique legislative authorities, missions, and jurisdictions." Dr. Kastner introduced me to such regulatory agencies as the United States Department of Agriculture (USDA), Department of Homeland Security (DHS), and the Food and Drug Administration (FDA). Incidentally, the FDA is involved with the regulation of vaping products, too, as I learned on my CFSAN visit described in my background above.

Competency Four - Food Safety Policy and the Global Food System

For competency four, students should be able to "analyze and distinguish how food safety and governmental biosecurity policies, globalization, and international trade cooperation influence public health" (Kansas State University MPH Program, 2019). Dr. Kastner's DMP 888 course provided the foundation for this competency by introducing me to the development of the globalization process and the influence that had on developing food safety and biosecurity policies. In my field experience, I witnessed the importance of good scientific policy making as well as innovative forms of cooperation (not between countries, but between school districts and state and local health departments).

Competency Five - Multidisciplinary Leadership

For competency five, students should be able to "contrast the food safety and biosecurity technical needs of different stakeholders and make judgements as to the appropriate methods of collaboration" (Kansas State University MPH Program, 2019).

Dr. Kastner and Dr. Nutsch accomplished this with their DMP 815 course. Throughout this course, I was exposed to different types of scientific reports designed to communicate with invested parties. For example, I wrote a technical report designed to educate a company or policy maker of a topic that they were not familiar with, followed by a recommendation on how to handle the situation. Additionally, I considered the consequences of releasing information in a developing situation to the press by writing a news release to control the flow of information to the public.

Chapter 4 – Discussion and Conclusion

My goals for this project were achieved and will continue to be implemented at Rossville Junior/Senior High School. The constant pressure that school-aged kids are under to “fit in” with their peers ensures that there will continue to be a need for an anti-vaping campaign for the foreseeable future. In the future, I will conduct much of the educational presentations myself and follow up with post-intervention surveys to ensure that knowledge was attained from my efforts. The education on vaping that I received by completing this project is an asset to my students, as I am better equipped to help them. My knowledge of electronic cigarettes and vaping will be beneficial to me as a teacher. In the past, students have likely carried their vaping devices right in front of me without my knowledge. Teacher interventions and positive student role models are essential in this fight to keep our students healthy.

The Covid-19 pandemic created some hurdles to completing this project. Fortunately, I was far enough along in the project that I had already completed the student contact components of the project. While causing some difficulties, the pandemic also raised some interesting questions for further research. For example, what influence do vaping and Covid-19 have on each other? Does vaping make an individual more susceptible to Covid-19 complications because of lung damage? Does vaping spread Covid-19 further by projecting it a longer distance in the aerosol ejection? These questions are worthy of exploration in the future, especially if Covid-19 remains a long-term issue.

I am grateful for the opportunity to complete this experience with Kansas State University. I especially enjoyed the chance to have a project that applies to students

with whom I work on a daily basis. I look forward to witnessing the positive effect that my field experience project will have on the student body at RJSHS.

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