

INITIATION OF AN ADOLESCENT SCHOOL-BASED ELECTRONIC NICOTINE
DELIVERY SYSTEM PREVENTION PROGRAM

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DOCTOR OF NURSING PRACTICE

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ABSTRACT

The leading cause of preventable disease, disability, and death in the United States is tobacco product use. The 2022 National Youth Tobacco Survey, which was completed in 2022, showed that the e-cigarette epidemic among youth continues to remain a public health threat. The survey revealed that over 2.5 million middle and high school students currently use e-cigarettes.

The purpose of this project was to provide youth with evidence-based education in a classroom setting. The education was designed to increase participant knowledge about health-related concerns of ENDS products, decrease participant intent to use ENDS products, and foster sustainability through training a school staff member in CATCH My Breath (CATCH, 2022). Seventh grade students at Kindred Middle School were educated using the CATCH My Breath (CATCH, 2022) vaping prevention program. The education was taught by the co-investigator and occurred in one class period for four weeks. This project was evaluated using pre- and post-survey results from the students.

The need for e-cigarette prevention in youth is evident. While the knowledge questions from this project did not show a statistically significant change, students demonstrated through comments, class discussion, and activity completion that they found the experience to be beneficial and educational. Enhanced knowledge is expected to decrease students' intent to use ENDS products in the future. Lastly, staff member CATCH My Breath (CATCH, 2022) training was accomplished on the last day of implementation. E-cigarette prevention is recommended due to continued rise in youth's e-cigarette use and the significant harm associated with it.

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DEDICATION

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INTRODUCTION

Background and Significance

The leading cause of preventable disease, disability, and death in the United States is tobacco product use. Traditionally, the vast majority of tobacco use was cigarette smoking, but that has transitioned to the use of electronic nicotine delivery systems (ENDS), cigars, and smokeless tobacco. If youth in the United States continue to smoke at the current rate, 5.6 million of Americans 18 years of age or younger are projected to die from smoking-related illness at a young age (Centers for Disease Control and Prevention [CDC], 2022a). Nine out of 10 adults who currently use tobacco started before the age of 18, so it is critical to prevent tobacco product use in adolescence (Gentzke et al., 2022). The prevention of tobacco use in adolescence will in turn decrease morbidity and mortality associated with tobacco-related deaths.

Currently, youth are using tobacco at high rates primarily due to the availability and popularity of ENDS products. ENDS are battery-operated devices that contain nicotine, flavoring, and other chemicals. To use an ENDS device, individuals inhale on the mouthpiece, which activates the battery-powered heating device and vaporizes the liquid in the cartridge, resulting in the inhalation of aerosol or vapor (NIH, 2020). In 2021, 2.55 million United States students reported the use of a tobacco product in the last 30 days. Of these students, 2.06 million were high schoolers and 470,000 were middle schoolers. The National Youth Tobacco Survey (NYTS) indicated that more than 2 million United States students reported currently using e-cigarettes. Of these students, 39.4% reported using e-cigarettes greater than 20 days out of 30 (U.S. Food and Drug Administration [FDA], 2022b).

Of the students surveyed using the NYTS, 16.6% reported that they believed that there is no harm or little harm associated with intermittent e-cigarette use (FDA, 2022c). It is crucial to

change this knowledge gap by initiating a school-level intervention program to prevent the use of ENDS and to educate adolescents on the dangers associated with nicotine use. While there are many nicotine cessation programs, evidence-based nicotine prevention programs for adolescents are sparse. Coordinated Approach to Child Health (CATCH) My Breath is an evidence-based ENDS prevention program for grades 5-12 (CATCH, n.d.). The goal of CATCH My Breath (CATCH, 2022) is to prevent the initiation of e-cigarette use among teens by increased education on ENDS, providing strategies to say “no”, and initiating goal setting for none-use (CATCH, n.d.).

Problem Statement

A considerable number of youth in the United States are using ENDS products, leading to addiction and continued tobacco use and in turn increasing their risk for tobacco-associated morbidity and mortality. Throughout the United States, there are many tobacco cessation programs available, but prevention programs are less common. Adolescents can be vulnerable to making poor decisions due to peer pressure and social immaturity (National Academies of Sciences, Engineering, and Medicine et al., 2019). That risk reinforces the importance of educating the adolescent population before they have the chance to try tobacco-related products. This project addresses the following question: “Will educating youth in a school-based ENDS prevention program increase their knowledge regarding the harms of tobacco use and decrease their intent to use an ENDS product by the end of the classroom-based curriculum?”.

Purpose

The purpose of this project was to provide youth with evidence-based education in a classroom setting to reduce their intent to use ENDS products. A pre- and post- education survey assessed for increased knowledge regarding ENDS use and decreased intent to use an ENDS

product. CATCH My Breath (CATCH, 2022) is a school-based program that provides education to help prevent the use of ENDS in youth. This project was specific to 12–13-year-olds who are in seventh grade. The overall goal of this project was to reduce ENDS product use in youth leading to decreased morbidity and mortality associated with tobacco-related deaths.

Objectives

The following are the practice improvement project objectives:

1. Increase participant knowledge about health-related concerns regarding the use of ENDS products by the end of the prevention program.
2. Decrease participant intent to use ENDS products by the end of the prevention program.
3. Foster sustainability through staff member CATCH My Breath (CATCH, 2022) training by the end of this prevention program

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

Chapter two includes a description of the theoretical framework and a review of the literature on ENDS products, prevention programs, and the role of the nurse practitioner. This review is divided into the following sections: a) Tobacco History, b) Tobacco Cessation Efforts, c) ENDS, d) ENDS Use in Adolescents, e) ENDS Adverse Effects, f) ENDS Prevention Programs, g) Catch My Breath (CATCH, 2022), h) Rural Health, i) Role of a Nurse Practitioner.

List of Definitions

Electronic Nicotine Delivery Systems (ENDS): There are many different ENDS products and ENDS terms, such as: vapes, vaporizers, hookah pens, e-cigarettes, e-cigars, and e-pipes. E-cigarettes use an e-liquid that contains nicotine, flavoring, propylene glycol, vegetable glycerin, and other harmful ingredients that are heated to create an aerosol that is inhaled by the user (U.S. Food & Drug Administration, 2022c).

Cessation Program: Cessation means a “temporary or final ceasing” of an action (Merriam-Webster, n.d.c). A cessation program is put into place to provide support to individuals who are trying to stop an unhealthy behavior, such as tobacco use.

Prevention Program: Prevention means to stop something from happening or the “act of preventing” (Merriam-Webster, n.d.a). A prevention program is put into place to reduce risk factors for developing a harmful disease, disorder, or addiction by increased education and guidance.

School-based Programs: School-based refers to a place that provides instruction, such as “an institution for the teaching of children” (Merriam-Webster, n.d.b). A school-based program is a prevention or cessation program that takes place in an adolescent’s classroom.

Theoretical Framework

This project was guided by Pender's Health Promotion Model (HPM) (Pender, n.d.). The HPM was originally developed in 1982 by Nola Pender, it has since been revised many times, with the latest revision being in 2002. This model recognizes that each person has unique personal experiences that affect their actions. The key concepts used as the basis for the HPM include the person, the environment, nursing, health, and illness (Pender, n.d.). Pender's model focuses on individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes. Health-promoting behavior is the desired outcome of this model resulting in improved health and quality of life. The HPM also has 13 statements that "provide a basis for investigative work on health behaviors. The statements are:

1. Prior behavior and inherited and acquired characteristics influence beliefs, affect, and enactment of health-promoting behavior.
2. Persons commit to engaging in behaviors from which they anticipate deriving personally valued benefits.
3. Perceived barriers can constrain commitment to action, a mediator of behavior as well as actual behavior.
4. Perceived competence or self-efficacy to execute a given behavior increases the likelihood of commitment to action and actual performance of the behavior.
5. Greater perceived self-efficacy results in fewer perceived barriers to a specific health behavior.
6. Positive affect toward a behavior results in greater perceived self-efficacy, which can in turn, result in increased positive affect.

7. When positive emotions or affect are associated with a behavior, the probability of commitment and action is increased.
8. Persons are more likely to commit to and engage in health-promoting behaviors when significant others model the behavior, expect the behaviors to occur, and provide assistance and support to enable the behavior.
9. Families, peers, and health care providers are important sources of interpersonal influences that can increase or decrease commitment to and engagement in health-promoting behavior.
10. Situational influences in the external environment can increase or decrease commitment to or participation in health-promoting behavior.
11. The greater the commitments to a specific plan of action, the more likely health-promoting behaviors are to be maintained over time.
12. Commitment to a plan of action is less likely to result in the desired behavior when competing demands over which persons have little control require immediate attention.
13. Persons can modify cognitions, affect, and the interpersonal and physical environment to create incentives for health actions” (Pender, n.d.).

Individual Characteristics and Experiences

Individual characteristics and experiences are related to prior behavior and personal factors. Personal behaviors are related to biological, psychological, and socio-cultural factors. Some of these factors include weight, sex, motivation, social status, race, education, and socioeconomic status. Many of these factors are unchangeable, however, it is important to know

as an educator that adolescents have characteristics and experiences that can determine their actions and behaviors.

Behavior-Specific Cognitions and Affect

Behavior-specific cognitions and affect include perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences, and situational influences. Perceived benefits are the positive consequences that one feels will occur from a health-promoting behavior. Perceived barriers are the anticipated or actual barriers that make a person not participate in a certain behavior. Perceived self-efficacy is the belief we have in our own abilities to execute a health-promoting behavior. The activity-related affect is the subjective feeling that occurs before, during, or after a behavior. Positive subjective feelings regarding a health-promotion behavior will increase self-efficacy. Interpersonal influences include norms, social support, and learned behaviors that individuals get from family members, friends, and healthcare providers. Situational influences consist of personal perceptions or beliefs of a given situation (Pender, n.d.). How an adolescent perceives a behavior plays a large role in whether they will adopt that behavior or choose something else. If the perceived benefits outweigh the barriers, the effect is positive, and the adolescent has positive interpersonal influences. Consequently, the adolescent's self-efficacy will be increased and more likely to choose a health-promoting behavior.

Behavioral Outcomes

Behavioral outcomes include the commitment to a plan of action, immediate competing demands and preferences, and health-promoting behavior. Intention to implement a healthy behavior depends on competing demands and preferences. Competing demands are alternative behaviors in which are hard to change due to prior engagements. Competing preferences are

alternative behaviors in which are easy to change because they are a choice related to desire (Gonzalo, 2021). To ensure implementation and success of a health behavior it is important to have a planned strategy. In order to have a planned strategy, the adolescent must have goals for their life that will promote this healthy behavior.

Application Related to Project

Pender's HPM was chosen to guide this project designed to prevent school-aged students from using ENDS products by increased education, guidance, and refusal strategies, which in turn will increase health-prompting behavior and self-efficacy (Penders, n.d.). Adolescents are exposed to pressure from the media, peers, and themselves to engage in risky behaviors. ENDS use falls into the category of risky behaviors, and it is the role of medical professionals, teachers, and parents to ensure that children receive the proper education to make informed decisions regarding their choices and their health (Gonzalo, 2021).

Some personal characteristics and experiences are hard to change, however, it is important to provide all adolescents with evidence-based information to help guide behaviors towards their goals and positive health outcomes. The goal of this project was to increase adolescent's evidence-based knowledge regarding ENDS and provide strategies to help promote self-efficacy. CATCH My Breath (CATCH, 2022) provided the resources and information needed to decrease their perceived barriers (CATCH, n.d.). By educating all seventh-grade students in a school-based setting, with a plan for sustaining the education in future years, it was anticipated that students would have positive interpersonal relationships and strive for health-promoting behaviors. All students should receive the information they need to make educated decisions regarding their personal health.

LITERATURE REVIEW

A literature search was conducted to review evidence regarding a) tobacco history; b) tobacco cessation efforts; c) ENDS; d) ENDS use in adolescents; e) adverse ENDS effects; f) ENDS prevention programs; g) CATCH My Breath (CATCH, 2022); h) rural health; i) role of the Nurse Practitioner (NP). The search was conducted using PubMed and Cochrane databases for articles published between January 2017 to September 2022.

Criteria used to search these data bases included peer reviewed journals and systematic reviews written in the English language and conducted on human subjects. Articles were also limited to being published in the United States. Keywords used in the search included “tobacco history”, “tobacco-related disease”, “tobacco cessation efforts”, “electronic nicotine delivery systems”, “electronic nicotine delivery systems in adolescents”, “electronic cigarette cessation programs”, and “electronic cigarette prevention programs”. The goal of this literature review was to provide evidence regarding ENDS use in adolescents and the effect that prevention programs have on future tobacco use. The literature described why this topic is important to nurse practitioners and other healthcare providers regarding health outcomes.

Tobacco History

Tobacco comes from the leaves of the genus *Nicotiana*, which is a plant that is native to North and South America (Mishra & Mishra, 2013). Tobacco has been used since the first century BC by the Mayan people who used it for religious ceremonies. By 470-630 AD, other tribes began using tobacco for religious rites and illness cures. By the 1400s, tobacco was being used in pipes, cigars, and snuff. In many countries, increased tobacco use was due to direct and indirect influences. Smoking was seen as part of being a man and was a sign of male authority, so many young boys began smoking earlier in life. Tobacco use also started becoming part of

social events and was considered an act of hospitality and friendship-binding. Some countries promoted tobacco use via associated positive health outcomes regarding tension, concentration, bad breath, and dental care. The United States promoted tobacco use by popularizing it through sports icons and the media (Mishra & Mishra, 2013).

Tobacco contains 2550 compounds and tobacco smoke contains 4000 compounds. Tobacco contains many carcinogens with nicotine being the most addictive (Mishra & Mishra, 2013). Tobacco smoke contains “carbon monoxide, thiocyanate, herbicide, fungicide and pesticide residues, tars, and many other substances which promote diseases and impair the body’s defense mechanism and functions” (Mishra & Mishra, 2013). Tobacco consumption of any kind is unhealthy and can lead to addiction, death, disease, and disability (Mishra & Mishra, 2013).

Smoking is the leading cause of preventable death and disease in the United States, killing about approximately 1 in 5 people, or around 480,000 deaths per year (CDC, n.d.). Furthermore, the CDC (2020) estimates that more than 16 million Americans are living with a disease caused by smoking. Smoking puts individuals at risk for cancer, heart disease, stroke, lung disease, diabetes, chronic obstructive pulmonary disease, tuberculosis, eye disease, and immune system problems. Heart disease is the number one cause of death in the United States. Eighty-three Americans die from heart disease and stroke every hour; a quarter of these deaths could be prevented by avoiding behavioral risk factors such as tobacco-product use (CDC, n.d.). Cigarette smoking is the number one risk factor for lung cancer. Eighty percent to 90% of lung cancer is attributed to cigarette smoking. Smoking cigarettes leads to a 15-30 times increased likelihood of getting lung cancer. Cigarette smoking is the main risk factor for lung cancer, but also can cause cancer of the mouth, throat, esophagus, stomach, colon, rectum, liver, pancreas,

larynx, trachea, bronchus, kidneys, bladder, and cervix (CDC, 2021). Secondhand smoke also causes lung cancer and directly causes 41,000 deaths each year (CDC, 2020).

In the United States every day, 1,500 youth under 18 smoke their first cigarette. Almost all tobacco-product use is started in adolescence when the developing brain is vulnerable to nicotine addiction (FDA, 2022a). The early education of youth regarding prevention of tobacco-product use and nicotine use will vastly decrease death, disease, and disability (FDA, 2022a).

Tobacco Prevention and Control Efforts

1. 1954: First article published that linked smoking and lung cancer
2. 1964: First surgeon general report on smoking published
3. 1966: Health warning appearing on cigarette packs
4. 1975: First statewide law that requires separate smoking areas in public places
5. 1984: Nicotine gum approved by FDA
6. 1987: Prohibits smoking on flights less than 2 hours
7. 1987: Aspen, CO becomes first city to require smokefree restaurants
8. 1988: First increase of cigarette tax
9. 1990: San Luis, CA becomes first city to eliminate smoking in public buildings
10. 1995: Nicotine declared a drug
11. 2002: Delaware becomes first smokefree state
12. 2009: FDA has regulatory authority over tobacco products
13. 2012: North Dakota becomes 28th smokefree state, media advertisements in place for people to quit smoking
14. 2014: Initiation of “The Real Cost”
 - a. FDA has regulatory authority over e-cigarette products

15. 2015: Hawaii becomes first state to raise minimum age to buy tobacco products to 21
16. 2016: Surgeon General report regarding dangers of e-cigarette use
 - a. Federal minimum age to buy e-cigarettes is 18 years old
17. 2018: Final ruling requiring public housing agencies to have smokefree policies for units and common areas
18. 2019: Tobacco-product sale age to 21 in all United States
19. 2020: Removal of all flavored cartridge-based e-cigarettes from the market
 - a. Increased price of cigarettes
 - b. Smokefree air policies
 - c. Tobacco product control programs
 - d. Warning labels on packages
 - e. Mass media campaigns regarding tobacco cessation
 - f. Insurance coverage for tobacco cessation efforts
20. 2021: Begin movement to remove all flavored cigars and menthol cigarettes

(American Lung Association, 2022)

Since 1964, federal and state legislatures have been fighting the tobacco product epidemic by establishing new laws and increasing cessation efforts. Treatments for tobacco cessation include behavioral therapy and medication implementation (NIDA, 2022). While great strides have been made in traditional tobacco cessation, there is room for improvement regarding e-cigarette prevention and cessation, especially for adolescents.

NIDA (2022) discussed multiple options for tobacco cessation. Tobacco dependent individuals have higher rates of cessation if they receive a combination of behavioral therapy and cessation medications. Behavioral therapy for tobacco cessation can occur both in person and

over the telephone. Cognitive behavioral therapy helps patients identify triggers, teaches them relapse-prevention skills and coping strategies to avoid smoking in the face of their triggers. Motivational interviewing (MI) allows patients to explore their resistance to tobacco cessation and make healthy changes. MI also allows the therapist or provider to identify discrepancies between patients' goals and their current behavior. Mindfulness is used to allow the patient to think about triggers and come up with alternative coping techniques. Phone quit lines, text messaging, web-based services, and social media support are also options. There are also multiple medications that are FDA approved for use in adults. FDA-approved medications include nicotine replacement therapies (NRT), bupropion, and varenicline. These medications decrease cravings and can greatly increase cessation in combination with other strategies. NRT is approved for adolescents under 18 years old, however the use of bupropion and varenicline is contraindicated for adolescents (CDC, 2022d). Transcranial magnetic stimulation (TMS) is in early stages of research but has been proven effective to reduce the number of cigarettes smoked by stimulating neural activity in targeted areas of the brain.

Treatment options are plentiful regarding tobacco prevention and cessation, but e-cigarette prevention and cessation treatment options are less abundant. While behavioral therapies are acceptable for e-cigarette cessation in both adults and adolescents, the availability of resources and quit lines are sparse (Burt & Li, 2020). The Truth Initiative has created three different e-cigarette smoking cessation programs to help increase the availability of resources, tools, and plans with the ease of anonymous text messaging (Truth Initiative, 2019). In North Dakota, NDQUITS also has My Life, My Quit (ND Health and Human Services, n.d.). No pharmacotherapy options are FDA approved for e-cigarette cessation. It is believed that if NRT is used for e-cigarette cessation the doses may be inadequate due to the increased dosage of

nicotine in e-cigarettes compared to tobacco products. While cessation resources are lacking for e-cigarettes, many regulatory laws have been put into place to help with e-cigarette prevention and cessation. Some of these changes include banning e-cigarettes from vending machines and requiring a warning statement on packaging detailing that the product contains nicotine (Burt & Li, 2020). In 2020, the FDA ordered the “removal of all flavored cartridge-based e-cigarettes from the market” (American Academy of Pediatrics [AAP], n.d.). However, this law “does not prohibit the sale of tobacco and menthol flavored cartridge-based e-cigarettes, flavored disposable e-cigarettes, or refillable flavored e-cigarette products” (AAP, n.d.). Many states have also increased e-cigarette tax, passed smokefree indoor air laws, and require a retail license to sell e-cigarettes (CDC, 2022).

ENDS

ENDS products were first introduced in China in 2003 and then made their way to the United States in 2006. ENDS products consist of a battery, a heating device, and a liquid. The liquid contains propylene glycol, vegetable glycerin, and nicotine. This e-liquid is heated by the coil and wick and produces an aerosol that is inhaled by the user (Ward et al., 2020). These aerosols have been found to produce toxic substances such as formaldehyde, nickel, cadmium, tin, acrolein, and lead. E-cigarettes come in many different shapes and sizes making them easy to conceal. One of the most common e-cigarettes is the JUUL which looks like a USB drive. The JUUL experienced a 600% increase in sales during 2016 to 2017. The JUUL pod contains as much nicotine as a pack of 20 cigarettes (U.S. Department of Health and Human Services, 2016). “ENDS have been proposed as a smoking cessation strategy, or for smoking reduction, but concerns also exist that ENDS may serve as a “gateway” to conventional tobacco products among adolescents” (Ward et al., 2020). According to Buettner-Schmidt et al. (2021), the use of

ENDS products as smoking cessation should be avoided due to the lacking quality control measures, minimal data on short- and long-term effects of ENDS on health, and the unknown amount of nicotine in ENDS products. The FDA has approved cessation medications that should be recommended for tobacco cessation over ENDS products, due to their proven efficacy and safety.

ENDS Use in Adolescents

Since 2014, ENDS have been the most-used tobacco product by United States youth. E-cigarette use among middle and high school students increased by 900% during 2011-2015. In 2019, over 5 million youth reported electronic cigarette use. Of these students, 970,000 of them reported daily use (Substance Abuse and Mental Health Services Administration [SAMHSA], 2020). Older male Hispanic or Caucasian students are more likely to use e-cigarettes than younger students and African Americans. The most common reasons adolescents begin using e-cigarettes include curiosity, flavoring/taste, and low perceived harm.

E-cigarette use often leads to the use of other tobacco products, such as cigarettes. A study showed that students who started using ENDS products by 9th grade were more likely to start smoking cigarettes within the next year. This study also found that individuals who use ENDS products are 7 times more likely to report cigarette use as compared to those who do not use ENDS (National Institute on Drug Abuse [NIDA], 2022). Some evidence has also been found that links e-cigarette use to increased use of cannabis and other illicit drugs (U.S. Department of Health and Human Services, 2020).

Prevention of ENDS use in adolescents and young adults is particularly hard due to risky behavior, advertising, and peer pressure. Due to this, the legal age to purchase tobacco products was increased to 21 to protect the health of our youth. However, a study found that youth still

obtained ENDS products from vape stores or online retailers, buying them from someone else, giving money to someone of age to purchase or receiving ENDS as a gift from a friend or family member. Advertisements regarding e-cigarettes target youth by showing youth individuals having fun while using ENDS products. These advertisements are more commonly seen on applications that adolescents use, such as, TikTok, Twitter, Instagram, and YouTube. ENDS advertisements encourage ENDS use by promoting flavoring and not talking about risks (SAMHSA, 2020).

Vulnerable youth are subject to peer pressure by influencers, friends, and family members. The most common responses by middle and high schoolers for why they tried an e-cigarette were that either a friend used ENDS or because they are less harmful than cigarette use. Many adolescents say they continue to use e-cigarettes because they are stressed or depressed (CDC, 2022c). NIDA (2020) found that teens did not know that vaping cartridges contained nicotine. The misinforming advertisements and availability of many e-liquid flavors leads adolescents to believe that they are safer than cigarettes. ENDS products are also easy to hide from teachers and parents because they do not smell of typical tobacco products and often do not look like a typical “vape” (NIDA, 2020).

Adverse ENDS Effects

Nicotine in the e-liquid is inhaled into the lungs and absorbed into the blood stream when an individual uses an ENDS. Nicotine stimulates the adrenal glands to release epinephrine and increases dopamine in the brain. Dopamine is a neurotransmitter in your brain that reinforces rewarding behaviors (NIDA, 2020). “Pleasure caused by nicotine’s interaction with the reward circuit motivates some people to use nicotine again and again, despite risks to their health and well-being” (NIDA, 2020). Adolescents are at particular risk, because their brains are still

developing up until the age of 25. Developing brains that have their reward circuits affected can cause adolescents to be more susceptible to developing addiction (Coke, 2020). Addiction has a strong hold on individuals and can cause long term issues for these adolescents. “Fewer than one in 10 United States adults successfully quit smoking each year” (CDC, 2020).

Addiction and brain synapse changes are only a small fraction of adverse effects caused by ENDS use. ENDS affect the respiratory system causing cough, increased respiratory rate, and shortness of breath, which can also increase an individual’s risk for asthma or chronic obstructive pulmonary disease (COPD). The use of ENDS products can also cause e-cigarette, or vaping, product use-associated lung injury (EVALI) which can be severe and life-threatening. The first case of EVALI was found in the summer of 2019 and by spring of 2020 there were 68 deaths reported to the CDC. Along with this 80% of the cases were younger than 35 years of age (UpToDate, 2023). The cardiovascular system is also affected causing increased heart rate, increased blood pressure, chest pain, and increased blood viscosity. These respiratory and cardiovascular changes put an individual at risk for stroke and myocardial infarction. The gastrointestinal system can also be affected by ENDS use, causing nausea, vomiting, diarrhea, and abdominal pain (Coke, 2020). Studies have also found that ENDS use is associated with depression, suicidality, disordered eating, ADHD, conduct disorder, impulsivity, and increased stress and anxiety (Becker et al.,2021). Long term side effects of ENDS remain unknown due to the short history of availability.

Rural Health

Tobacco product use and secondhand smoke remains the leading cause of preventable disease, disability, and mortality in the United States. While most of the United States is seeing a decline in tobacco product use, rural population use rates remain high. Adverse effects of

tobacco product use include an increased risk of dying from heart and respiratory disease. In the United States, chronic obstructive pulmonary disease (COPD) and heart disease rates are highest in rural counties. It is believed that rural areas have higher smoking rates due to demographic and psychosocial factors (Buettner-Schmidt et al.,2019). Some of these factors include lower income and education and higher unemployment. Cessation efforts have increased barriers in rural areas due to access and resources (Vance et al., 2022). Due to these barriers, it's important that rural, underserved communities participate in tobacco and e-cigarette prevention programs.

ENDS Prevention

Risk-taking and experimentation occurs frequently in childhood and adolescence. This risk-taking can include tobacco or e-cigarette use. Many youth never try tobacco or e-cigarette products, but some become regular users and lifelong smokers. There are short- and long-term consequences that arise from smoking, which are stated above. E-cigarette prevention programs can educate youth on how to make informed decisions for themselves as they are challenged with peer pressure (Liu et al., 2020).

Schools and classrooms have been an ideal setting for tobacco product prevention efforts, because students spend a large amount of their time at school, and they can get this information alongside their peers. When prevention programs are taught in classrooms it helps adolescents with decision-making and refusal skills and gives them confidence as they learn with their peers. The most effective tobacco product prevention program includes information regarding the topic as well as interactive content that encourages discussion (Liu et al., 2020).

CATCH My Breath

CATCH My Breath (CATCH, 2022) is a vaping prevention program developed by The University of Texas Health Science Center at Houston (UTHealth) School of Public Health.

CATCH My Breath (CATCH, 2022) is the only evidence-based youth nicotine vaping prevention program for grades 5-12 that showed evidence of significantly reducing students' likelihood of vaping. The program consists of four lessons that are about 35 minutes each. Each session includes learner outcomes, an outline for teaching, and all materials needed to provide the education. The goal of CATCH My Breath (CATCH, 2022) is to provide students with knowledge and skills to make informed decisions regarding e-cigarettes and how to manage peer pressure. The goals of this program are evaluated using a pre- and post-survey (Coordinated Approach to Child Health (CATCH), 2022).

“CATCH My Breath (CATCH, 2022) was informed by theoretical perspectives of social cognitive theory, evidence-based strategies from tobacco prevention programs, and risk-factor data from recent research on e-cigarettes” (Kelder et al., 2020). Throughout the program students were educated on the content of ENDS, the short-term adverse health effects, and the schools' policies and age-related restrictions for use. Students also discover that ENDS use is not common behavior among middle school students. Motives for using ENDS will be explored and positive alternatives are discussed. Students learn how their social and environmental influences have pressured them into using ENDS. Lastly, students learn refusal skills and make a commitment to remain ENDS free (Kelder et al., 2020). Not only will students receive information regarding ENDS prevention, but they will be given a handout with resources for ENDS cessation to reach the students that have already used ENDS products. Educators are trained via webinar to ensure preparedness and proper training and education.

CATCH My Breath (CATCH, 2022) was evaluated using a pilot test in 12 middle schools in central Texas from January 2017 to May 2018. There were 6 control schools and 6 intervention schools. A questionnaire administered before initiation of the program that assessed

knowledge and attitudes toward ENDS use, ever and 30-day ENDS use, past 30-day tobacco use, race, and sex. From baseline to 16-month follow up, ever ENDS use increased by 6.2% in the control schools and 2.1% in the intervention schools. Intervention schools had significant improvements in ENDS knowledge and positive outcomes for not using ENDS. Intervention schools had a significant decrease in rates of ever using ENDS after 16 months (Kelder et al., 2020).

CATCH My Breath (CATCH, 2022) is updated every year regarding new information and research. The high school version was completed in 2019 and the elementary version is underway. Kelder et al., (2022) report that “as of June 2020, approximately 4,000 schools in the United States have adopted the program, 70,000 teachers have taught the program, and 1,400,000 students have been exposed to the program materials”. This represents 25% of the school marketplace. Of those schools utilizing the CATCH My Breath (CATCH, 2022) program all have reported positive feedback without any unanticipated negative outcomes. National dissemination has occurred by CATCH Global Foundation, CVS Health, Discovery Education, school districts, and community partners (Kelder et al., 2022).

Role of a Nurse Practitioner

Nurse practitioners (NP) provide health care through a patient-centered care approach. NPs promote healthy lifestyles by focusing on health promotion, disease prevention, and health education (American Association of Nurse Practitioners [AANP], n.d.). Providers have the unique opportunity to provide patients with evidence-based knowledge regarding the use of ENDS. Adolescents are receiving incorrect or targeted information from their peers, the internet, and social media. Healthcare providers have a duty to prevent disease, so it is important to address the e-cigarette epidemic. ENDS prevention can be done by asking patients about e-

cigarette use, providing education, promoting a nicotine-free lifestyle, and providing patients with resources (U.S. Department of Health and Human Services, n.d.).

Summary

Adolescents in rural counties are at increased risk for tobacco and ENDS use. ENDS use has many adverse effects, including the progression to tobacco and illicit drug use. Prevention programs allow adolescents to get evidence-based information to make an informed decision regarding their health and future goals. CATCH My Breath (CATCH, 2022) is an evidence-based vaping prevention program that has had success regarding increased knowledge and a decreased intent to try ENDS products by the end of the program.

METHODS

Overall Project Design

This educational improvement project took place in the classroom setting at Kindred Middle School in Kindred, ND. The purpose of this project was to increase knowledge about ENDS use and promote informed decision-making regarding ENDS use. A member of the school staff was invited to observe the training and deliver the training in future years. The project data was evaluated and analyzed using quantitative methods. Program evaluation included pre-and-post surveys assessing adverse health outcomes of ENDS use, decreased intent to use, and the CATCH My Breath (CATCH, 2022) program overall.

Implementation Plan

The Iowa Model Revised

The evidence-based practice (EBP) model chosen to guide this project was the Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care (Iowa Model Revised) (Iowa Model Collaborative, 2017). Permission was granted to use this model (Appendix F). This model was developed in 1994 and revised in revised in 2017. The original model was based on the Diffusion of Innovations Theory and the Quality Assurance Model Using Research, making it a problem-solving approach for healthcare improvement (Hanrahan et al., 2019). The revision included the addition of a purpose statement, feedback loops, and expansion of piloting, implementation, patient engagement and sustaining change. Since the revision, The Iowa Model Revised has been proven useful for making and sustaining EBP change in healthcare (Hanrahan et al., 2019). This model was created to be a guide for nurses to use research findings to help improve patient care. Although the project is not directed at a patient care improvement, it does involve identifying where an EBP change is needed along with

identifying the problem, forming a team, analyzing research, implementation of project, and evaluation of results (Cabarrus College of Health Sciences, 2022).

Step 1 & 2: Identifying the Issue and Stating the Purpose

The first step of the Iowa Model involves identifying triggering issues and opportunities (Iowa Model Collaborative, 2017). There are five categories of triggers to help guide research. These categories include data and new evidence, research and literature, agency requirements or regulations, clinic or patient identified issues, and organization, state, or national initiatives (Iowa Model Collaborative, 2017). Once the issue is identified, then the purpose of the project can be stated. To define the purpose, one must ask who the population is, what is the planned intervention, what is the comparison, and what is the goal of this project (Iowa Model Collaborative, 2017). The purpose of this project was based on the above questions and resulted in this purpose statement: the purpose of this project was to provide youth with evidence-based education in a classroom setting to reduce their intent to use ENDS products.

Once the purpose of the EBP project is decided, the second step is to decide if the chosen topic is a priority for the organization and/or the community. ENDS products became available in the United States in 2007 and have been the most commonly used tobacco product in youth since 2014. In 2018, the Surgeon General declared an epidemic of youth ENDS use (CDC, 2020). The 2022 National Youth Tobacco Survey found that 2.14 million high school students and 380,000 middle school students currently use ENDS products (FDA, 2022b). The information above validates the importance and increased priority for this project, as it hopes to increase information regarding ENDS use and decrease adolescents' intent to use. Once the purpose statement was deemed a priority, it was time to find an appropriate population in which

to implement this project. Regarding the Iowa Model, the purpose statement was a priority, and the target population was identified, so the project could move forward to step number three.

Target Population: Due to increased prevalence of tobacco product use and decreased resources in rural areas, targeted this underserved population. The co-investigator implemented this project in Cass County at Kindred High School in Kindred, North Dakota (ND) which is 35 miles from Fargo, N.D. Eligible participants included all seventh-grade students who attend Kindred High School. The seventh-grade cohort was chosen based upon feedback from the co-investigator, the Kindred High School principal, and the Kindred High School nurse. Previous ENDS education was taught to ninth-grade students at this school, and it was determined that this behavior was often beginning at a much earlier age. The educational program was introduced to parents and/or guardians via email in February of the 2023 spring semester. This allowed parents to be aware that the teaching is occurring and provide the option to opt out if they desire. This education was taught to 74 seventh-grade students during their spring semester of 2023, one student was opted out by their guardian. Faculty was also able to listen alongside their students. The education was taught during the normal school hours in selected class periods. Inclusion criteria includes all seventh-grade students who were enrolled at Kindred High School at the time of the project and have parental consent. There is no exclusion criteria and students were not excluded based on gender or ethnicity.

Step 3: Forming a Team

The formation of a team is the next step in the progression of the Iowa Model. It is important to find team members who agree that this project is of importance and should be implemented. There were many stakeholders involved in this project with the most active participants being the co-investigator and the Kindred High School principal. Other faculty that

were utilized during this process were the Kindred High School nurse, physical education teacher, and health teacher. The dissertation committee includes chair, Dr. Mykell Barnacle from the School of Nursing, Dr. Kelly Buettner-Schmidt from the School of Nursing, Dr. Abigail Burkett Vetter from the School of Nursing, and Dr. Leah Irish as the North Dakota State University (NDSU) graduate appointee.

Institutional Review Board: NDSU Institutional Review Board (IRB) approved project implementation and ensured appropriate protection for human subjects. Parents were given the opportunity to provide consent or decline regarding their child’s participation in this educational project. Students were not required by the co-investigator to attend these educational settings and were able to withdraw their participation at any time without consequences. Surveys obtained before implementation and after implementation from students were anonymous and optional for all participants involved. Risks of this program to the students included the time needed to participate in the educational course and to complete the pre- and post- surveys. Risk to the students also included disclosure of sensitive information regarding an illegal act. Benefits of this program to the students included increased knowledge of ENDS products resulting in informed decision making regarding the use of ENDS products.

Step 4: Assemble, Appraise, Synthesize

This step involves assembling, appraising, and synthesizing evidence utilizing a systematic search which encourages weighing quality, quantity, consistency, and risk ((Iowa Model Collaborative, 2017). This step requires vigorous evaluation, analysis, and synthesis of all available literature on the topic of choice. This step was completed in the literature review provided in Chapter Two of this dissertation. Once the evidence has been reviewed, it is time to ask, “is there sufficient evidence”? If no, the negative feedback loop will redirect the writer to

conduct more research. If yes, the writer can move on to development and implementation of the EBP project (Iowa Model Collaborative, 2017). While proposing this project, identifying team members, and evaluating research, the evidence was deemed sufficient to implement this school based EPB project.

Step 5 & 6: Develop and Implement

Once the project is deemed sufficient for implementation, the next step is to pilot the change in practice. This step includes informing key stakeholders on the implementation plan, making set plans for implementation, and ensuring an appropriate evaluation tool. This project utilized the CATCH My Breath (CATCH, 2022) program that was originally piloted in 2016 to 2017 in twelve Texas middle schools (Kelder et al., 2020). The goal of this program was to decrease middle school children's intent to use ENDS products through increased education.

The co-investigator wanted to initiate this program in a rural area due to the increased rates of tobacco-related death, increased tobacco product use, and the lack of resources. This co-investigator emailed the principal of Kindred High School, Kent Packer. This email introduced the co-investigator, the dissertation process, and the suggested program. The conclusion of the email was asking for Kindred High School consideration in adapting this program in their curriculum. On Tuesday December 6th, 2022, the co-investigator met via Zoom with Mr. Packer and was able to give him additional information regarding the CATCH My Breath (CATCH, 2022) program and implementation process. Implementation of this dissertation project to be completed at Kindred High School in their 7th grade class during the spring semester of 2023 was approved. The parents received the email regarding their passive consent on March 3rd and had 1 week to opt their child out by either emailing Mr. Packer or sending the opt-out form back to school with their child (Appendix I). Students were given the pre-survey on March 8th, 2023. The

curriculum was taught via the co-investigator March 22nd, March 29th, April 3rd, and April 12th during their 2nd, 4th, 6th, and 7th periods. The post-survey was given to the students on April 19th, 2023.

The students with parental approval were sent a link on their MacBook Pros to complete the pre-implementation survey (Appendix C) one week prior to the first session. The education was taught by the co-investigator and occurred in one class period for four weeks in total. One week after the final session, the students were sent a link on their MacBook Pros to complete the post-implementation survey (Appendix D). The co-investigator compared the pre- and post-surveys for evaluation of learning.

The first objective of this project was to *increase participant knowledge about health-related concerns regarding the use of ENDS products by the end of the prevention program*. This objective was met by implementing the CATCH My Breath (CATCH, 2022) program to a cohort of 7th grade students at Kindred High School. This program consisted of four 20-45 minute in person classroom sessions that occurred in a four-week period. CATCH My Breath (CATCH, 2022) is a free program that provides online training for educators, parental consent documentation, pre- and post- surveys, teaching outlines, and a PowerPoint (Appendix E) that was utilized during implementation. The co-investigator completed the online training and utilized the parental consent, the pre- and post- surveys, the teaching outlines, and the PowerPoint.

The second objective of this project is *decreasing the participants intent to use ENDS products by the end of the prevention program*. This objective was accomplished by educating 7th grade students via the CATCH My Breath (CATCH, 2022) program in hopes that they will be able to make an educated decision to not use ENDS products.

The third objective of this project is *for a member of the Kindred High School 7th grade faculty will become trained in CATCH My Breath (CATCH, 2022) in order to continue this education yearly for students*. This objective was accomplished with the help of the Kindred High School staff to determine who would be the best educator for this training. The educator of choice was given the information needed to complete the training and given tips and resources by the co-investigator.

Step 7: Evaluate & Disseminate

The evaluation of this project was completed via the pre- and post-implementation surveys (Appendix C&D) on Qualtrics. The pre- and post- surveys were created by CATCH My Breath (CATCH, 2022) and consist of 44 multiple choice questions that compare the students' knowledge about ENDS products, their current potential use, current friend use, their intent to use, their opinions about using ENDS products or not using ENDS products, the adverse health outcomes of ENDS use, the content in ENDS products, different pressures they may come across, and refusal strategies. The co-investigator along with NDSU statisticians compared results of the surveys while keeping confidentiality through use of personal code assigned to each student. Any answers that did not have a corresponding result were excluded from analysis. This decreases the risk for skewed results and allows for comparison of pre- and post-survey answers. The first objective was evaluated by questions 15, 16, 17, 18, 19, 20, 21, 23, 24, 27, and 31, which addressed vaping knowledge, side effects, and consequences. The second objective was evaluated by questions 5, 7, 8, 9, 10, 11, 12, 40, 41, 42, 43, and 44, which address prior vaping, ENDS product used, and interest/intent to vape. The third objective was evaluated by discussion with the Kindred High School principal and faculty after sharing results of this

project. There were an additional 5 questions added to the post-implementation survey to allow for student feedback regarding whether this curriculum was beneficial and should be continued.

Dissemination. The final step of the Iowa Model consists of dissemination of the results found throughout the entirety of the project. First, a poster was presented to all in attendance at the North Dakota Nurse Practitioner Association Pharmacology Conference in September of 2023. Following completion of my outcomes, dissemination of this project through NDSU graduate school, committee chair, and committee during the dissertation defense. Dissemination of this project will occur to Kindred High School 7th grade faculty via email or oral presentation following dissertation defense.

Table 1

Logic Model

| <p>Project Goals: Prevent use of ENDS products in 7th grade students at Kindred Middle School through implementation of a classroom-based ENDS prevention program. Increasing knowledge regarding adverse health effects of ENDS use and promote informed decision making in youth to prevent initiation of vaping.</p> <p>Objective One: Increase participants knowledge about health-related concerns regarding the use of ENDS products by the end of the prevention program.</p> <p>Objective Two: Decrease the participants intent to use ENDS products by the end of the prevention program. Objective Three: A staff member at Kindred Middle School will finish CATCH My Breath (CATCH, 2022) training by the end of my prevention program to continue this education yearly for students.</p> | | |
|---|--|---|
| Inputs | Activities | Participation |
| <ul style="list-style-type: none"> • Co-investigator as CATCH My Breath (CATCH, 2022) facilitator • CATCH My Breath (CATCH, 2022) Program online education session and resources • Literature review • Partnership with Kindred High School • Teacher’s time during the school hours to help with facilitation • Principal’s time regarding approval for implementation • NDSU faculty participation and evaluation • 7th grade students • Parents/Guardians of the students • Kindred Middle School facility and resources | <ul style="list-style-type: none"> • Collaboration between NDSU (DNP student) and Kindred Middle School • Implement the CATCH My Breath (CATCH, 2022) program through four 30–40-minute, classroom educational sessions for middle school students • Pre- and post-surveys • Collect, evaluate, and report survey outcomes | <ul style="list-style-type: none"> • Email communication and collaboration with principal • Survey completion by students • Approval by students’ parents regarding implementation of project • Student’s participation in classroom activities |
| Outcomes | | |
| Short Term | Medium/Long Term | |
| <ul style="list-style-type: none"> • 90% of all students included in educational sessions attend all four sessions offered. • Students with increased knowledge of adverse health outcomes of using ENDS products. • Students with decreased intent to use ENDS products • 90% of students report decreased intent to use ENDS products on the postsurvey • Free educational material for teachers • Faculty completes free CATCH My Breath (CATCH, 2022) facilitator education | <ul style="list-style-type: none"> • Significant decrease in ENDS use in Kindred middle school students • Kindred Middle School will implement the CATCH My Breath (CATCH, 2022) program curriculum into yearly schedule • Surrounding schools adopt this program | |

Setting

The setting of this project was in Kindred, ND at Kindred High School. The co-investigator wanted to implement this project in rural ND and after reaching out to many school districts, Kindred High School was interested in project implementation. Kindred is in Cass County, but is located 20 miles southwest of Fargo, ND. As of 2019, Kindred had 781 residents, 394 of those being male and 387 of those being female (City-Data, n.d.). The median resident age is 29.5. The percent of residents living in poverty was 3.2%. This community is 93.8% Caucasian with American Indian being the second most common race at 2.7%. Kindred Elementary School is for K-6th grade and Kindred High School is 7th-12th grade (City-Data, n.d.). The Kindred School district serves the surrounding communities, including Davenport, Hickson, Leonard, Oxbow, and Walcott.

Sample/Sample Size/Recruitment

The participants involved in this project include the co-investigator, the Kindred High School principal, the Kindred High School faculty, the parents or guardians of the students, and the 7th grade students at Kindred High School. Inclusion criteria included all 7th grade students enrolled at Kindred High School and who obtained passive parental consent and give their own assent (Appendix H). In addition, all the students who participated needed to complete both the pre-survey and post-surveys to use their answers for the results. There was no exclusion criteria and students were not excluded based on gender or ethnicity. There were 75 total 7th grade students enrolled at Kindred High School, and all but one was included following consent and assent. Students are not required by the co-investigator to participate in the project, however, the school mandates that students attend classes in which they are enrolled. Students were also not required to complete the pre- and post- surveys. IRB approval was obtained before initiation of

project in the school-based setting. Risks to the students included their time to complete the pre-survey, the post-survey, and their time to participate in the curriculum. It was also potentially a risk to students to provide incriminating information regarding their use of ENDS since the surveys were taken in their classroom alongside peers. Benefits to the students included increased knowledge of ENDS products resulting in informed decision making regarding the use of ENDS products and their health.

Summary

The CATCH My Breath (CATCH, 2022) program was implemented at Kindred High School to a group of students who were determined by Kindred Middle School administration and via parent consent. The CATCH My Breath (CATCH, 2022) program was taught by the co-investigator to increase adolescents' knowledge regarding negative health outcomes of ENDS use and decrease adolescents' intent to use ENDS products. The Iowa Model guided the project implementation by providing structured steps to follow throughout the process to ensure EBP changes that improve outcome (Iowa Model Collaborative, 2017). The outcomes of this project were evaluated using quantitative and qualitative data analyzed by the co-investigator with guidance from a statistician at NDSU. The overall goal of dissemination will be committee and graduate school approval along with Kindred High Schools' intent to continue ENDS prevention education.

RESULTS

The purpose of this project was to provide youth with evidence-based education in a classroom setting to reduce their intent to use ENDS products. Seventh-grade students were taught the CATCH My Breath (CATCH, 2022) curriculum over a four-week period. One week before initiation of this project, the students were given a pre-survey to analyze their prior knowledge of ENDS products and their current use or intent to use ENDS products. One week after finishing the CATCH My Breath (CATCH, 2022) curriculum, the students completed a post-survey to analyze their knowledge of ENDS products and their current use or intent to use ENDS products after being provided with evidence-based education.

Objective One

The first objective of this project was to increase participant knowledge about health-related concerns regarding the use of ENDS products by the end of the prevention program. This objective was assessed by evaluating questions 15, 16, 17, 18, 19, 20, 21, 23, 24, 27, and 30 which addressed vaping knowledge, side effects, and consequences. This data was analyzed using descriptive statistics via an NDSU statistician and NDSU Qualtrics. Table 2 shows the difference in student answers from the pre-survey to the post-survey with all answers excluded if it did not have a corresponding result in either the pre- or post-survey. This decreased the risk for skewed results and allowed for direct comparison of pre- and post-survey answers based on the individual students. Questions 15, 17, 18, 19, and 21 answers consisted of “*true*” and “*false*”. Question 16’s answers consisted of “*true*”, “*false*”, and “*I don’t know*”. Question 20’s answers consisted of “*more than other e-cigarettes*”, “*about the same*”, “*less than other e-cigarettes*”, and “*I don’t know*”. Questions 23, 24, 27, and 30 answers consisted of “*strongly agree*”, “*agree*”, “*disagree*”, and “*strongly disagree*”.

Although some questions showed a positive change from pre- to post-survey in Table 2 after discussion with the NDSU statistician it was agreed that inferential statistics were not necessary because the results did not foster enough change. In addition to the pre-written CATCH My Breath (CATCH, 2022) questions, the co-investigator added two additional questions at the end of the post-survey that assessed the students' beliefs regarding their own learning experience and what they thought was most beneficial to their education. One of these questions consisted of "yes" and "no" answers and the other was an open-ended question; both are shown below in Figure 1 and Table 3. There were 84.5% of the responding students that said that they learned something new during this education. Forty-one students provided examples of what they thought was the most beneficial to their learning, these were categorized with sample language below.

Table 2

Subject Knowledge

| Question | Percent of students who answered correctly on the pre-survey | Percent of students who answered correctly on the post-survey (number of students who correctly changed their answer) | Total number of students who answered both pre- and post-surveys |
|---|--|---|--|
| E-cigarettes contain harmful chemicals like nicotine (True) | 100% | 97% | 63 |
| *Nicotine can change the way your brain works (True) | 94% | 97% (1) | 68 |
| When you are addicted to e-cigarettes, it means you cannot stop using e-cigarettes (True) | 61% | 56% | 55 |

Table 2. *Subject Knowledge* (continued)

| | | | |
|---|-----|----------|----|
| Using e-cigarettes can harm many parts of your body (True) | 98% | 98% | 64 |
| *Advertisements about e-cigarettes are meant to make young people use them (True) | 57% | 86% | 38 |
| *How much nicotine is in a JUUL compared to other e-cigarettes? (More than other e-cigarettes) | 1% | 29% (17) | 68 |
| *Teens who are younger than 18 years can use e-cigarettes (False) | 83% | 95% (6) | 42 |
| Most students my age use e-cigarettes (strongly disagree, disagree) | 98% | 95% | 68 |
| Most kids in high school use e-cigarettes (strongly disagree, disagree) | 82% | 82% | 68 |
| *If I were to use an e-cigarette or vaping device, I would feel less stressed (strongly disagree, disagree) | 94% | 96% (2) | 68 |
| If I were to use an e-cigarette or vaping device I would worry about my health (strongly agree, agree) | 90% | 85% | 68 |

*Positive change

Figure 1

Do you feel you learned something new during our four educational sessions?

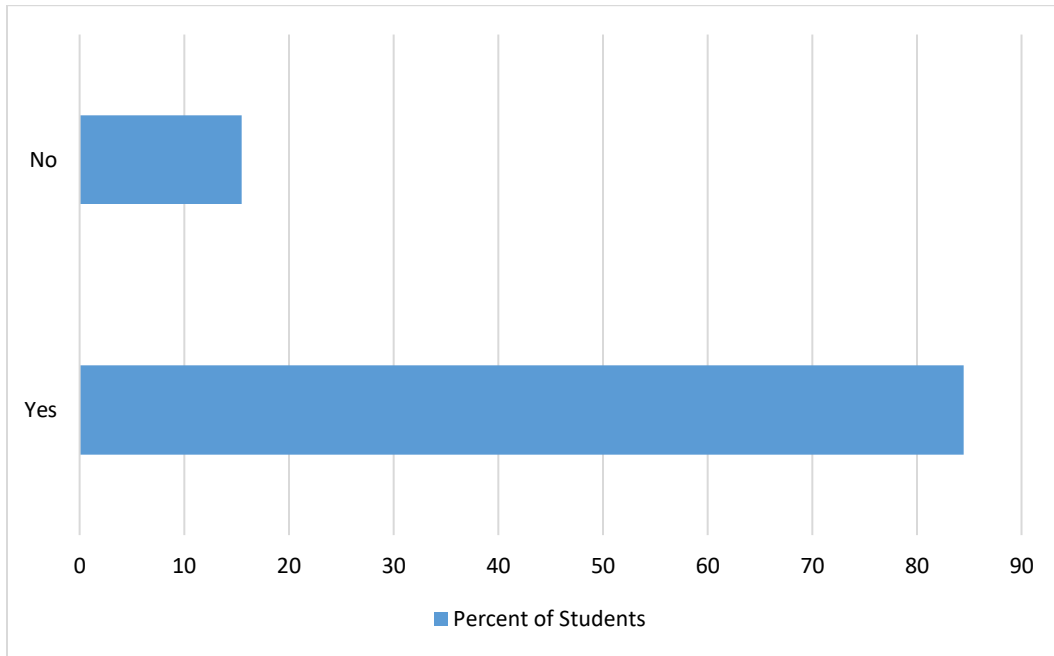


Table 3

If yes, what do you think is the most beneficial?

| Categories | | |
|------------------------------|-----------------------------|-----------------------------|
| E-cigarette Components | Harms | Refusal Strategies |
| Answers | | |
| Not water vapor | Can make stress worse | Ways to say no |
| Inhaling chemicals and metal | How addictive it can be | How to leave a situation |
| Nicotine is in e-cigarettes | Nicotine rewires your brain | How to handle peer pressure |

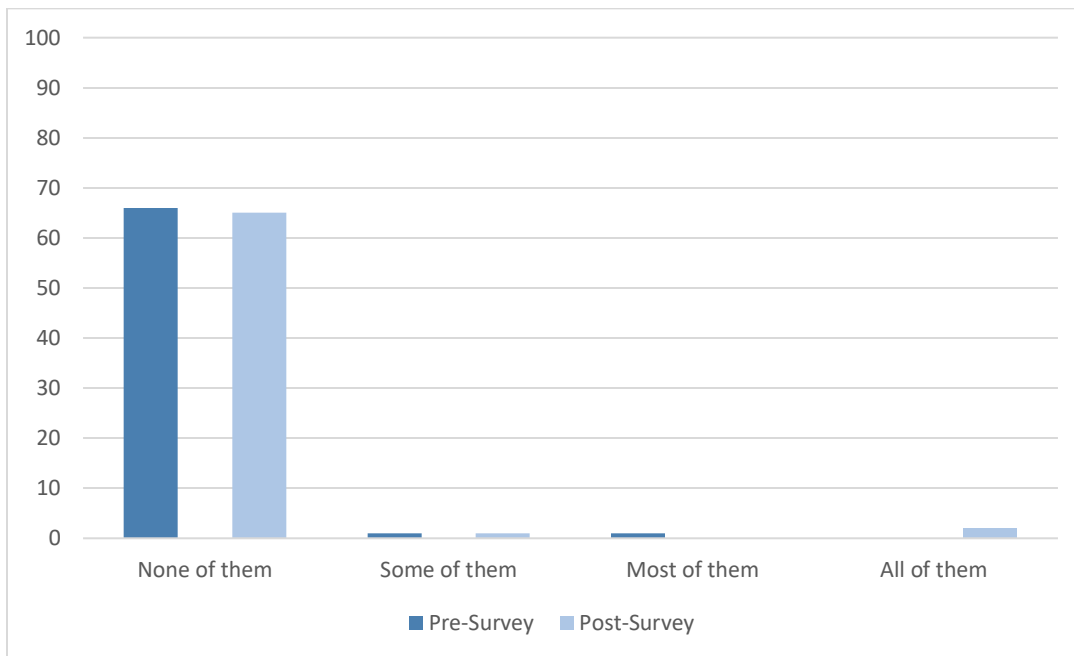
Objective Two

The second objective of this project was to decrease participant intent to use ENDS products by the end of the prevention program. This objective was assessed by evaluating questions 5, 7, 8, 9, 10, 11, 12, 40, 41, 42, 43, and 44 which addressed prior vaping, ENDS product used, and interest/intent to vape. After further discussion with the NDSU statistician, it was agreed that inferential statistics were not necessary because the results did not foster enough

change. The data was analyzed using descriptive statistics based upon findings from Qualtrics surveys. Any answers that did not have a corresponding results were excluded from analysis to decrease the risk for skewed results and allow for direct comparison of pre- and post-survey answers for each individual student. The results of these questions are laid out below in bar-graph format for easier assessment. In many of the questions addressed below, it appeared that students answers either changed negatively or stayed the same. This will be further analyzed in the discussion and recommendations chapter below.

Figure 2

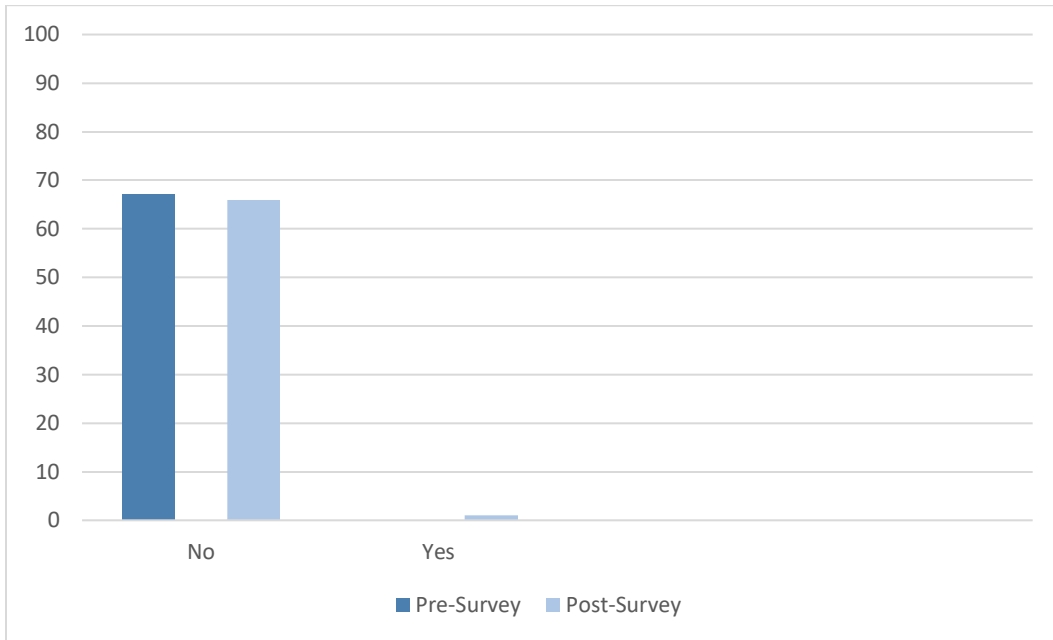
How many of your close friends use e-cigarettes?



*Three students changed their answer from none of them to some of them and all of them and two students changed their answer from some of them and most of them to none of them.

Figure 3

Have you ever used an electronic cigarette, even once?



*One student changed their answer to yes

Figure 4

E-cigarette usage

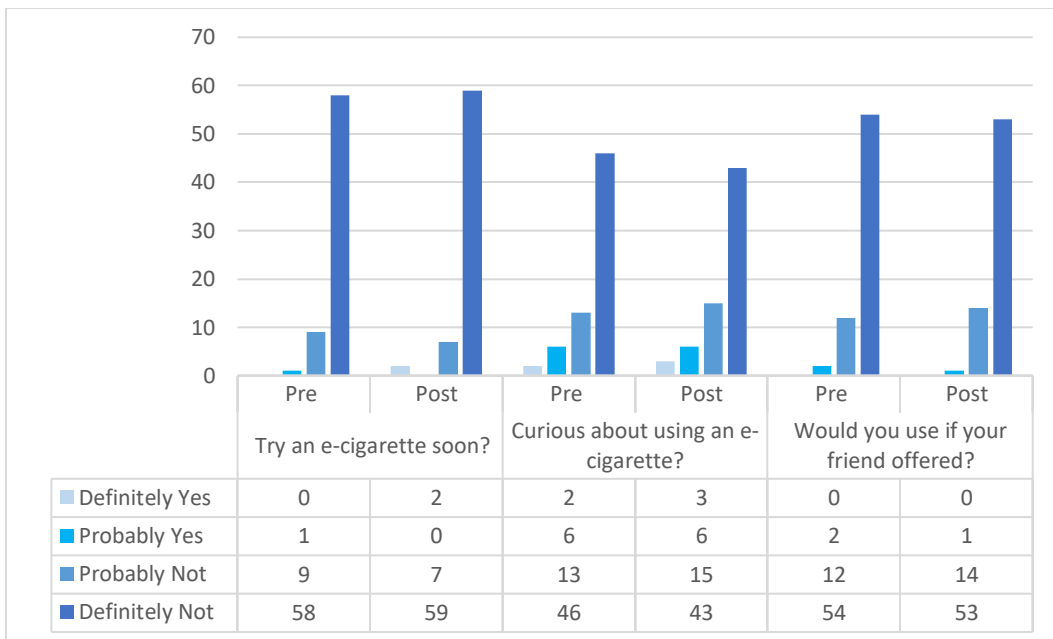
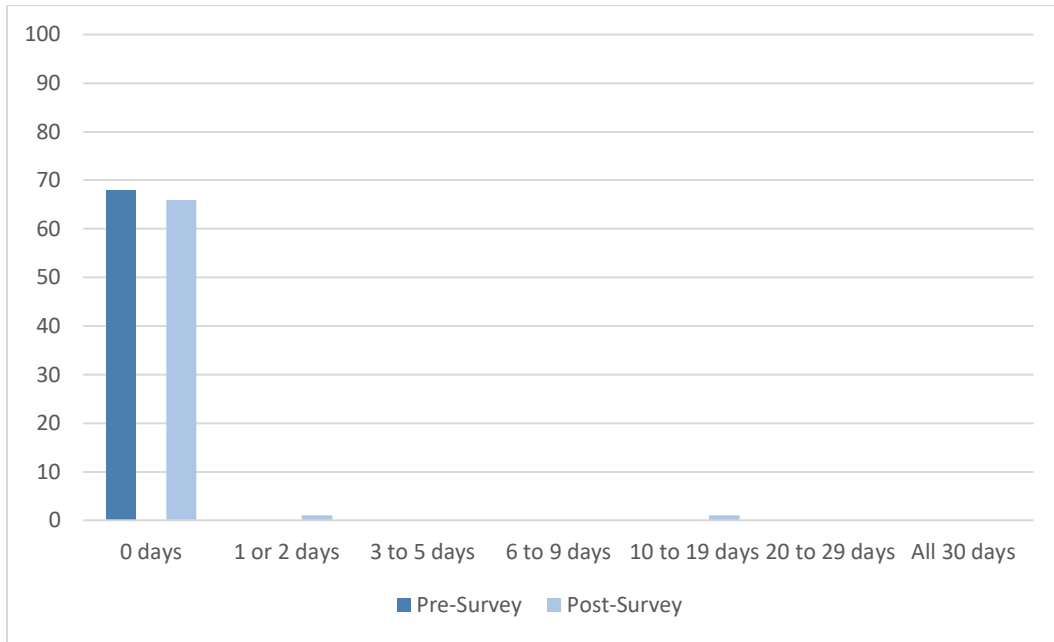


Figure 5

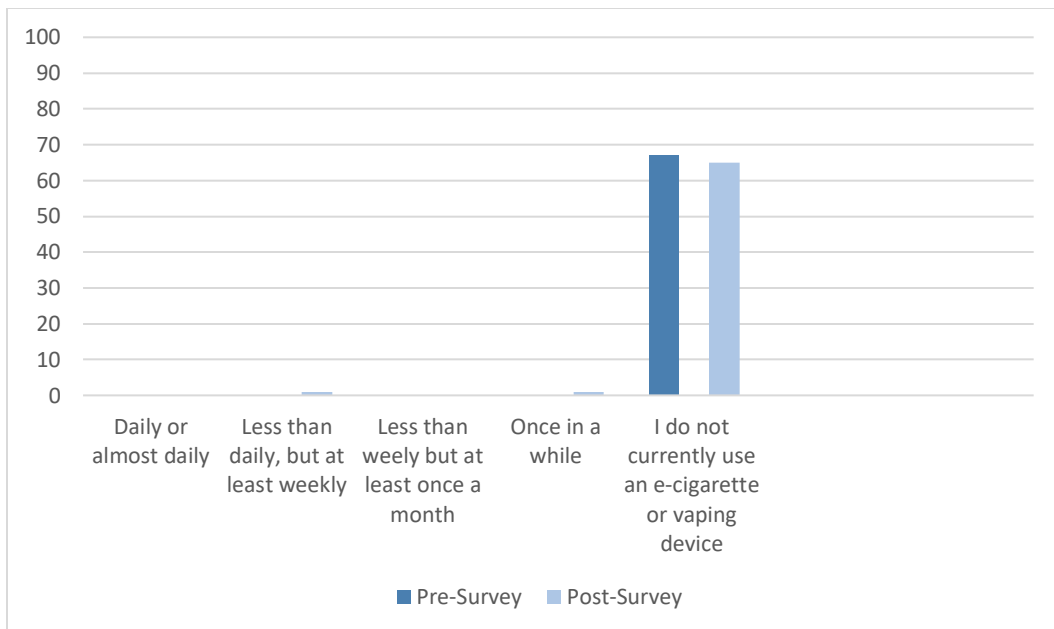
During the past 30 days, on how many days did you use an e-cigarette?



*Two students changed their answers from 0 days to 1-2 days and 10-19 days.

Figure 6

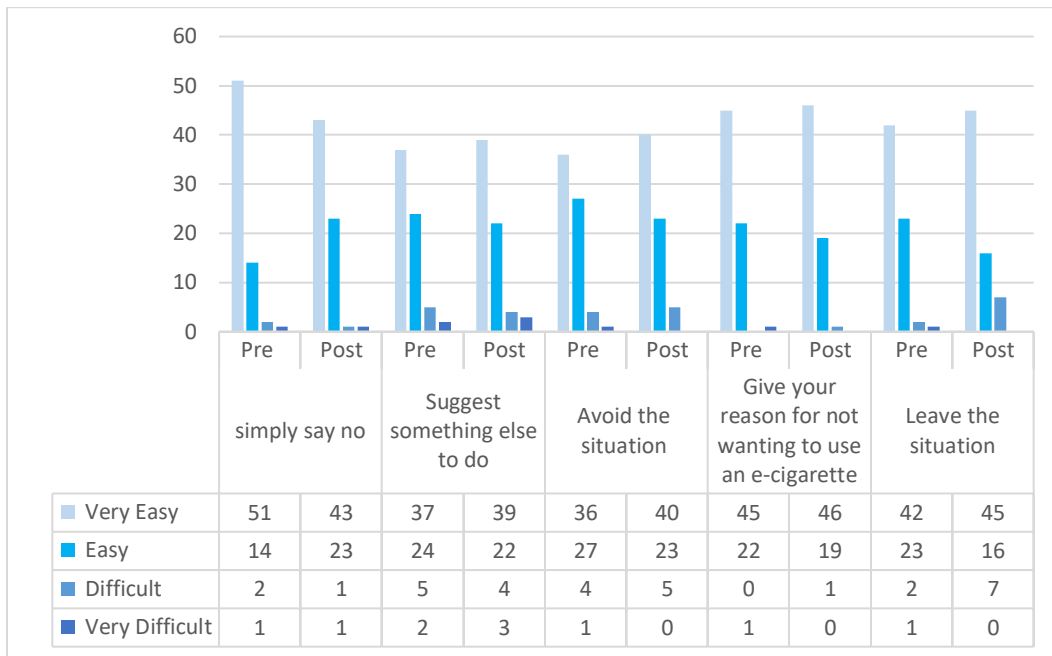
How often do you currently use an e-cigarette or vaping device?



*Two students changed their answers from I do not use to once in a while and less than daily, but at least weekly

Figure 7

If you were offered an e-cigarette how easy would it be for you to...



Objective Three

The third objective of this project was to foster sustainability through staff member CATCH My Breath (CATCH, 2022) training by the end of this prevention program. This objective was met as the 7th grade health teacher completed her CATCH My Breath (CATCH, 2022) training on 4/12/2023. Project results will be disseminated to Kindred High School principal and faculty as desired with the goal of curriculum continuation after this semester. The first step in this process is teacher education and enrollment, which is completed, making continuation straight-forward. In addition to CATCH My Breath (CATCH, 2022) training, the co-investigator added three additional questions at the end of the post-survey that assessed the students’ thoughts on project continuation and recommendations for improvement. One of these questions consisted of “yes” and “no” answers and the other two were open-ended question; all are shown below in Figure 2 and Tables 4 and 5. In responding students, 92.8% of them said that

this education should be continued at their school and were able to give reasons why they thought this and 19 had recommendations for how to make this education better.

Figure 8

Would you recommend this education be continued in the school?

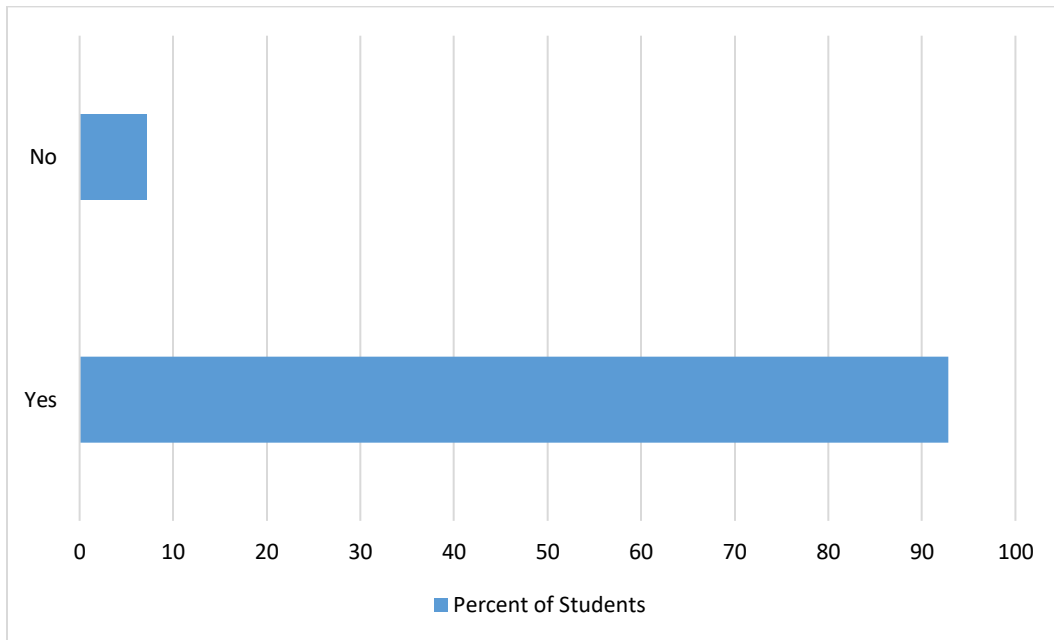


Table 4

Why or why not?

| Categories | |
|---------------------------------------|--------------------------------|
| Why should it be continued? | Why shouldn't it be continued? |
| Sample Answers | |
| It is important | We already know |
| Help people quit and not start vaping | It is boring |
| We need to know how bad it is | Don't care |

Table 5

Any recommendations how to make this education better?

| Categories | |
|------------------------|-------------------|
| Yes | No |
| Sample Answers | |
| More hands-on learning | "No" |
| Play more games | It was great |
| More videos | I like how it was |

DISCUSSION AND RECOMMENDATIONS

Summary

This project was implemented with the intent to increase adolescent knowledge about e-cigarettes, decrease their intent to use, and foster sustainability of the e-cigarette prevention program at Kindred High School. CATCH My Breath (CATCH, 2022) is an evidence-based electronic nicotine delivery system prevention program that consists of four consecutive weeks of education delivered to youth. Before implementation, a pre-survey was administered to the students and after implementation a post-survey was administered to these same students to allow for project analysis. The quantitative data from this project, which allowed for evaluation of the first and second objectives, was statistically insignificant. However, the qualitative data, open-ended questions, student participation, and in-class activities suggested program benefit. Students were able to provide the co-investigator with examples of increased knowledge, decreased intent to use, and recommendations and encouragement for curriculum continuation at their school. In addition, the third objective of staff member training was completed by their health teacher before implementation completion.

Discussion

The 2022 National Youth Tobacco Survey showed that the e-cigarette epidemic among youth continues to remain a public health threat. This survey indicated that over 2.5 million middle and high school students currently use e-cigarettes. Among these students, 46% of high schoolers who used e-cigarettes did it nearly daily (Koval, 2022). Use of e-cigarettes was four times higher in youth than in adults, which is alarming when the sale of e-cigarettes went up 81% between the years of 2017 to 2022 (Truth Initiative, 2023a). Many youth are drawn to e-cigarette use due to the many appealing flavors available. From June 2021 to June 2022, youth-appealing

flavors quadrupled (Truth Initiative, 2023b). In addition to increased flavor options, e-cigarettes with greater than 5% nicotine have also increased from 5% in 2017 to 81% in 2022. E-cigarettes with increased nicotine content have also become cheaper than their counterparts with less nicotine content, making them more desirable and cost efficient (Truth Initiative, 2023a). Although many short-term side effects of e-cigarette use have been identified, at this time, e-cigarettes have not been around long enough to fully understand the long-term effects. Researchers agree that further studies need to be conducted to evaluate the long-term effects of e-cigarettes on an individual's health.

The goal of a classroom-based prevention program is to provide students with evidence-based information about the harms of e-cigarette use and in turn decrease their intent to use them. Schools and classrooms are excellent settings to deliver e-cigarette prevention programs, allowing for students to learn and gain efficacy alongside their peers (Liu et al., 2023). "E-cigarette prevention programs should be easily adaptable and accessible to help with wider dissemination and implementation of programs" (Liu et al., 2023, p. 4). The best way to accommodate for this is for the education program to be completely online and free of cost. Prevention programs should also begin early to help prevent addiction and adverse health effects. Additionally, e-cigarette prevention programs should be addressed separately from general tobacco prevention and cessation. Many students do not correlate e-cigarettes as a tobacco product (Liu et al., 2023). Regarding the importance and relevance of an e-cigarette prevention program, Ma et al.'s (2033) found that adolescents who were exposed to e-cigarette prevention education had "higher vaping risk perceptions", "more vaping knowledge, lower intentions to vape, and higher perceived message effectiveness". This finding suggests the importance of e-cigarette prevention targeting adolescents at a young age.

Objective One

The first objective of this project was to increase participant knowledge about health-related concerns regarding the use of ENDS products. This was assessed using 10 pre-written questions from the CATCH My Breath (CATCH, 2022) program. This specific group of students already possessed a good understanding of the risks associated with e-cigarette use. While this was an encouraging discovery, this objective was partially met as only 5 of the 10 questions assessed showed increased knowledge by the participating students.

Five questions showed improvement from the pre-survey to the post-survey. “Nicotine can change the way your brain works”, “Advertisements about e-cigarettes are meant to make young people use them”, “How much nicotine is in a JUUL compared to other e-cigarettes?”, “Teens who are younger than 18 years can use e-cigarettes” and “If I were to use an e-cigarette or vaping device, I would feel less stressed” were the questions that showed positive improvement on the post-survey. “Nicotine can change the way your brain works” changed from 94% correct on the pre-survey to 97% correct on the post-survey, however, only 1 student changed their answer from false to true. “Advertisements about e-cigarettes are meant to make young people use them” changed from 57% correct on the pre-survey to 86% correct on the post-survey, with 13 students who changed their answer from false to true. The correct answer increased from 1% to 29% on the question “How much nicotine is in a JUUL compared to other e-cigarettes?” with 17 students changing their answer correctly. “Teens who are younger than 18 years can use e-cigarettes” showed a 12% increased improvement from pre- to post-survey with 6 students changing their answer from true to false. Lastly, “If I were to use an e-cigarette or vaping device, I would feel less stressed” changed from 94% to 96% correct from pre- to post-survey with 2 students who changed their answer correctly.

Additional questions were added to the pre-made CATCH My Breath (CATCH, 2022) survey to further evaluate the project. One of these questions was “Do you feel you learned something new during our four educational sessions?”. The vast majority (84.5%) of students that said that they learned something new during this education and some provided examples of what made it most beneficial in the following question. Along with these additional questions, the students were asked as part of the CATCH My Breath (CATCH, 2022) curriculum to complete a variety of different assignments. One of these activities asked them to answer three “what, why, how” questions. These questions include “What did you learn about how e-cigarettes can affect your health, social life, finances, environment, and goals?”, “Why is it so important that you learned this? How does it affect you and your life?”, and “Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?”. All students present in class that day were able to provide educated answers to all these questions; see examples in Appendix J. The second activity asked the students to create a social media post that would encourage their peers to be vape free. The posts that these students created included pictures, facts, or quotes that they learned during this educational program; see examples in Appendix K. Although these two questions, the in-class assignments, and five of the pre-written knowledge questions showed improvement, the remaining five knowledge questions had no change or worsened from pre- to post-test, which is why this objective was deemed partially met.

The results of this project indicate that the co-investigator should have chosen different knowledge questions that would have resulted in more improvement. The co-investigator could have this by creating a new survey rather than utilizing the pre-written CATCH My Breath

(CATCH, 2022) questions. Additionally, the co-investigator would also create hard stops on each of the questions to ensure full survey completion by the participating students. This would increase the total number of responses for each question and could allow for further analysis. Although this objective was only partially met, the literature shows the importance e-cigarette prevention education for youth in reducing the number of adolescents using e-cigarettes.

Objective Two

The second objective of this project was to decrease participant intent to use ENDS products. This objective was analyzed looking at 12 questions associated with prior ENDS use and intent to use. During classroom sessions, students were forthcoming about their peers' e-cigarette usage and reported that the majority abstained from it. Most students reported that they were non-users and had no plans to start. This finding influenced this objective as proving a decreased intent to use was difficult if students were not using prior and already had no intent to do so. The question that asked the students directly about use was "Have you ever used an electronic cigarette, even once"; on the pre-survey 67 students said no as compared to the post-survey where 67 students said no, and 1 student said yes. However, the pre-survey question "How often do you currently use an e-cigarette or vaping device" showed that 67 students currently did not use ENDS products; however, the post-survey showed that 2 students changed their answer from currently did not use ENDS products to using less than daily, but at least weekly and to once in a while. "Do you think that you will try an e-cigarette soon?" was another question that directly analyzed intent to use. The pre-survey question showed that 58 students said definitely not, 9 students said probably not, and 1 student said probably yes while the post-survey showed that 59 students said definitely not, 7 students said probably not, and 2 students said definitely yes. When analyzing these results, it appears that students' intent to use e-

cigarettes increased for those students who changed their answers from pre- to post-survey. Along with decreased intent to use, students were asked about refusal strategies to help decrease peer pressure regarding e-cigarette use and these questions also appeared to worsen on the post-survey. In the pre-survey, 19 students had indicated that giving refusal strategies was difficult or very difficult and 22 students indicated that giving refusal strategies was difficult or very difficult on the post-survey. This showed that three students found giving refusal strategies more difficult after implementation of this program.

While these results were disheartening, the co-investigator was informed by the students' teacher that many students were hesitant to be honest on the pre-survey due to fear of repercussions from the school or the law. In retrospect, the co-investigator should have gone to the school and discussed the survey with the students prior to taking the pre-survey to ensure they knew their answers would stay anonymous and that only the co-investigator would see them. This could have helped increase the honesty on the surveys and in turn allowed for better results. During the last session with these students, the confidentiality associated with the post-survey was discussed and students were reminded that honest answers would not be met with repercussions. Failure to discuss confidentiality before the pre-survey could have contributed to the negative change in post-survey results. The results of this project were inconclusive for this objective, the number of students reporting intent to use remains low in both the pre- and post-survey in this group of students, indicating finding statistical significance either way was difficult.

Objective Three

The third objective of this project was to foster sustainability through staff member CATCH My Breath (CATCH, 2022) training; this objective was met. Of the participating

students, 92.8% said that this education should be continued at their school. The common comments from students who did not encourage continuation said that they already knew this information and that it was boring. The students who urged for continuation said that knowing the risks is important and reinforcing they should not start vaping. When asked for additional recommendations to improve this education students said: no changes, to make it more fun, play more games, more hands-on learning, more activities, more videos, and show more examples of the dangers with pictures. While the co-investigator did get positive feedback and comments, the overall benefits of the CATCH My Breath (CATCH, 2022) educational program was not directly commented on. Overall, the statistically insignificant results from the rest of this project indicate it may be beneficial to revise the program used or alter the education that CATCH My Breath (CATCH, 2022) provides. During implementation, it was evident that students knew that e-cigarette use was bad for them but did not know exactly why. There were many aspects of this education that students were not aware of based on in-class discussion, such as knowing what was in e-cigarettes, that e-cigarette use can lead to addiction, and that use can increase anxiety and depression. Emphasizing these aspects when educating students along with incorporating more videos, real life scenarios, and in-class discussion and activities while eliminating long lectures would be beneficial. While this program did not result in statistically significant findings at this school, the evidence still encourages the use of e-cigarette prevention education in the classroom setting.

Recommendations

This educational project did not show statistically significant changes due to students' current knowledge, their lack of e-cigarette use or intent to use, and the potential of dishonest answers; however, the qualitative data indicated that most students found the information useful

and valuable. The qualitative data indicated that the education was beneficial for the students learning and was recommended for continuation by a majority of the seventh-grade class.

Previous research has shown that e-cigarette prevention education is beneficial for students in a classroom setting, leading to decreased intent to use, decreased negative health outcomes, and increased knowledge regarding adverse side effects. E-cigarette cessation has been shown to be difficult in youth due to their increased susceptibility to addiction, which makes e-cigarette prevention paramount.

Although this project was not completed in a healthcare setting, the research and results can directly be related to the role of a nurse practitioner regarding e-cigarette prevention and use in youth. Nurse practitioners have a duty to provide appropriate education to improve health outcomes. The e-cigarette epidemic and its relation to adverse health outcomes warrants continued assessment of e-cigarette use in adolescents at routine clinic visits. It is important to discuss this topic each visit with adolescents to allow for open communication and conveyance of evidence-based education regarding the negative health outcomes of e-cigarette use. Ensuring youth receive this education during early adolescence will increase their knowledge of adverse health effects of e-cigarette use and in turn, decrease their intent to use them.

Recommendation for Future Projects

The students' engagement, qualitative feedback on surveys and activities, and in-class discussion encouraged the co-investigator that this educational program was impactful to the students involved. The co-investigator recommends that e-cigarette prevention be continued by other NDSU DNP cohorts at additional school districts to help eliminate or minimize the e-cigarette epidemic in the adolescent population. While the co-investigator does recommend

continuation, there are additional modifications and suggestions provided to improve the education.

Preparing students for the pre-survey by communicating their survey answers were private and confidential may produce more meaningful results. Additionally, making the pre- and post-surveys more objective-focused and formatting the education to enhance student engagement may show better results. If this project is replicated, the co-investigator should meet with the students, form rapport, and explain the privacy and confidentiality of the survey findings prior to administering the pre-survey. In addition, the co-investigator recommends reviewing other prevention programs or creating a different program to increase student participation and learning. If the CATCH My Breath (CATCH, 2022) education is utilized, the co-investigator recommends shortening the amount of education time and adding more videos and activities.

In addition to addressing the implications of the pre-survey, for future projects, the co-investigator also suggests decreasing or editing the survey questions. Another option is to change the project objectives. While writing the results chapter, relating some of the pre-written questions from CATCH My Breath (CATCH, 2022) to the objectives of this project was difficulty, making evaluating the questions in general hard to do. Some questions from the validated survey did not play a part in any project objective, which could have led to student survey fatigue due to having to answer over 40 questions. If this project was replicated, the co-investigator would encourage the DNP student to modify the pre- and post-survey so that it directly relates to their objectives to more easily assess the data and relate the data to results. A shorter survey would also be suggested to ensure that students are engaged throughout the survey and more likely to complete the survey. Additionally, the results of the survey would be better interpreted if each question on the survey had to be answered by the student. This could be done

by putting a hard stop on Qualtrics, which would not allow a student to move past a question without providing an answer. This change would help compare results of the pre-and post-survey, because the number of students answering each question would be the same. The students' parents gave their consent, and the student gave their assent to participate, so it could be an expectation to also complete the whole pre- and post-survey.

If this project was to be replicated, the co-investigator suggests considering having the education taught by the educator employed by that school. This could increase students' attention and participation. Observation of the class showed the co-investigator that students listened and participated more when their actual teacher was lecturing. If the faculty was teaching, bonus points for assignments and activities or other participation incentives could be considered to increase students' interest in the in-class and take-home activities. If the CATCH My Breath (CATCH, 2022) training and implementation is completed by the employed educator, the school may have more buy in to continue education use due to teacher preparedness.

Lastly, there could be an option to assess these same students in one to two years to see if their use or intent to use e-cigarettes is still low or if many of them began using as they continued throughout middle school and into high school. This could better assess these students' long term knowledge retention regarding e-cigarette prevention, allowing the co-investigator to see what influenced these students to remain e-cigarette free.

Recommendation for Kindred High School

ENDS prevention education should be provided to every adolescent to decrease their intent to use and in turn minimize the ENDS epidemic in the United States. While the quantitative data gathered was not statistically significant, the qualitative data and feedback from the students encouraged continuation of ENDS prevention education at Kindred High School.

While educating the students, it was evident to the co-investigator that a majority of these seventh-grade students were not currently using ENDS, however the students discussed that their high school counterparts were using them. ENDS prevention should be taught to students prior to the start of use, making 5-7th grade an ideal age to receive the content. Continuation of this education should be completed by a current faculty member at Kindred High School. The CATCH My Breath (CATCH, 2022) ENDS prevention program has many included activities, which were well received by the students. However, since the assignments and activities were not mandatory, many students did not complete them. If this program was to be continued by Kindred High School, points should be allocated to these activities and assignments for better student participation and buy in. However, additional resources and projects would also be beneficial to consider.

Dissemination

The gap between knowledge and application is often due to ineffective dissemination. It is important to disseminate project findings to the correct audience. If dissemination is being presented to non-research-based individuals, the dissemination needs to elicit interest, emotion, and usefulness (Brownson, et al., 2018). To evoke continuation in the classroom setting, the dissemination of this information needs to be presented less quantitatively and more qualitatively. Student comments and illustrations show better uptake of information than the analysis of the survey questions. The goal of dissemination is to encourage application and continuation.

Dissemination will include presentation to the committee via PowerPoint during the dissertation defense by the co-investigator. This project was presented at the annual NDNPA Pharmacology Conference in Bismarck, ND via a poster presentation completed by the co-

investigator. The goal of the poster presentation was to present the data to other providers and increase their awareness regarding ENDS use in youth. The Kindred High School principal was asked how he would like dissemination to be presented to himself and staff and he opted to be sent recommendations for the school via email. This e-mail was sent on January 8th, 2024, and is located in Appendix O. Lastly, this dissertation paper will be published via the NDSU library and ProQuest.

Strengths and Limitations

Strengths

The co-investigator found through implementation that faculty buy in is the most important step in project implementation. Kindred High Schools faculty (or teacher) participation and their willingness to collaborate with NDSU allowed for project success. The co-investigator worked alongside one teacher who assigned the pre- and post- surveys, allowed the co-investigator to educate during her class time, helped getting the students' attention when necessary, and encouraged the co-investigator along the way. Faculty at Kindred High School had tobacco prevention and cessation education built into their 9th grade curriculum, but they were eager to see if this education needed to be implemented earlier due to increased ENDS product use.

The second strength of this project was that the co-investigator was able to replicate a previous project completed by another NDSU graduate student. This allowed the co-investigator to make changes based on her recommendations and limitations that she found. The co-investigator was able to participate in the previous co-investigator's implementation, which allowed for appropriate changes to be made along with ideas to help with student participation and attention.

The third strength of this project was the fill in the blank questions the co-investigator had the students complete in the post-survey. Although the multiple-choice questions were statistically insignificant, many students had positive things to say regarding the program, their increased knowledge, and their plan to avoid ENDS products in the future. These same thoughts were given by the students during their social media post regarding ENDS products. The students' positive feedback through comments provided insight on their increased knowledge, ideas for change, and encouragement for continuation.

Limitations

In any project, unfortunately, there are limitations that the investigator does not anticipate. The first limitation that the co-investigator found was that many of these students were already very knowledgeable regarding the basics of ENDS products, which limited the ability for the first objective to be met. This could have been avoided if the pre-and post-survey questions asked more CATCH My Breath (CATCH, 2022) specific questions and less general knowledge questions.

The second limitation that was discovered was the students' hesitation to be honest on the pre-survey. The students shared concerns with their teacher regarding who would see these results and if the school or their parents would be informed. The hesitancy of students in expression their honest answers could potentially have influenced the outcomes of the second objective. In retrospect, the co-investigator should have gone to the school before the pre-survey was delivered and explained who would see the results and that their answers would remain confidential.

The third limitation was that the students did not have a good rapport with the co-investigator which limited their cooperation and full attention. After project implementation, the

co-investigator realized that the information may have been taken more seriously if the current teacher was engaged in facilitation of the course. If the co-investigator met with the teacher before implementation, given her the educational objectives, and had her take the training before implementation; the project may have been more successful.

Lastly, students were permitted to skip questions in the survey before proceeding to the next one. This hindered the ability to compare pre-and post-survey results accurately and completely. If given the opportunity to redo this, it would be beneficial to require students to answer each question before moving forward. This approach would enhance the accuracy of the results, facilitating better comparisons.

Conclusion

The need for ENDS prevention in youth is evident. While the knowledge questions from this project did not show a statistically significant change, qualitative data such as student comments, class discussion, and activity completion showed that students gained some knowledge. However, the goal to decrease their intent to use was not met and appeared to worsen on the post-survey. Students advocated for continuation of e-cigarette prevention programs at their school, but the impact of CATCH My Breath (Coordinated Approach to Child Health (CATCH), 2022) was not evident. The recommendation is for further evaluation of additional programs or revamping the CATCH My Breath (CATCH, 2022) education to better engage students.

The role of a nurse practitioner is to provide youth with evidence-based education regarding the negative health outcomes related e-cigarette use. This can be done by advocating for early adaptation of an e-cigarette prevention program in the classroom setting. CATCH My Breath (CATCH, 2022) is an evidence-based e-cigarette prevention program shown to increase

adolescents' knowledge of the harms of e-cigarette use and decrease their intent to use them. The overall recommendation from this project is that e-cigarette prevention programs should be administered to youth before they have the chance to start using ENDS. Whether schools chose to use the CATCH My Breath (CATCH, 2022) program or a different educational e-cigarette prevention program, formal education in a classroom setting will be beneficial for ENDS use prevention.

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APPENDIX A: IRB APPROVAL



03/01/2023

Dr. Mykell M Barnacle
Nursing

IRB Approval of Protocol #IRB0004658, "INITIATION OF AN ADOLESCENT SCHOOL-BASED ELECTRONIC NICOTINE DELIVERY SYSTEM PREVENTION PROGRAM"

Co-investigator(s) and research team:

- Mykell M Barnacle
- Morgan Watterson

Approval Date: 03/01/2023

Expiration Date: 02/28/2026

Research site(s): The setting of this project will take place in Kindred, ND at Kindred High School. Kindred is a rural community in Cass County, located 20 miles southwest of Fargo, ND. As of 2019, Kindred had 781 residents, 394 of those being male and 387 of those being female (City-Data, n.d.). The median resident age is 29.5. The percent of residents living in poverty was 3.2%. This community is 93.8% Caucasian with Native American the second most common race at 2.1%. Kindred Elementary School is for K-6th grade and Kindred High School is 7th-12th grade (City-Data, n.d.)

Funding Agency:

Review Type: Expedited category # 7

The above referenced protocol has been reviewed in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, *Protection of Human Subjects*).

Additional approval from the IRB is required:

- Prior to implementation of any changes to the protocol.
- For continuation of the project beyond the approval period. A task will automatically generate for the PI and Co-PI 8 weeks prior to the expiration date. To avoid a lapse in approval, suspension of recruitment, and/or data collection, a report must be received, and the protocol reviewed and approved for continuation prior to the expiration date.

Other institutional approvals:

- Research projects may be subject to further review and approval processes.

A report is required for:

- Any research-related injuries, adverse events, or other unanticipated problems involving risks to participants or others within 72 hours of known occurrence.
- Protocol Deviations
- Any significant new findings that may affect risks to participants.

Thank you for cooperating with NDSU IRB procedures, and best wishes for a successful study.

NDSU has an approved FederalWide Assurance with the Department of Health and Human Services: FWA00002439.

04/17/2023

Dr. Mykell M Barnacle
Nursing

IRB Approval of Amendment to Protocol #IRB0004658 , “INITIATION OF AN ADOLESCENT SCHOOL-BASED ELECTRONIC NICOTINE DELIVERY SYSTEM PREVENTION PROGRAM”

Co-investigator(s) and research team:

- Mykell M Barnacle
- Morgan Watterson

Funding Agency:

Change: additional questions on post-survey

Research site(s): The setting of this project will take place in Kindred, ND at Kindred High School. Kindred is a rural community in Cass County, located 20 miles southwest of Fargo, ND. As of 2019, Kindred had 781 residents, 394 of those being male and 387 of those being female (City-Data, n.d.). The median resident age is 29.5. The percent of residents living in poverty was 3.2%. This community is 93.8% Caucasian with Native American the second most common race at 2.1%. Kindred Elementary School is for K-6th grade and Kindred High School is 7th-12th grade (City-Data, n.d.)

The protocol amendment request and all included documentation for the above-referenced project have been reviewed and approved via the procedures of the North Dakota State University Institutional Review Board. Current protocol approval expires - 02/28/2026.

Thank you for cooperating with NDSU IRB procedures, and best wishes for a successful study.

NDSU has an approved FederalWide Assurance with the Department of Health and Human Services: FWA00002439.

RESEARCH INTEGRITY AND COMPLIANCE

NDSU Dept 4000 | PO Box 6050 | Fargo ND 58108-6050 | ndsuhresearch@ndsuh.edu

Shipping Address: Research 1, 1735 NDSU Research Park Drive, Fargo ND 58102

NDSU is an EO/AA university.

APPENDIX B: EXECUTIVE SUMMARY

Executive Summary: Adolescent School-Based E-Cigarette Prevention Program



The leading cause of preventable disease, disability, and death in the United States is tobacco product use. The 2022 National Youth Tobacco Survey showed that the e-cigarette epidemic among youth continues to remain a public health threat. This survey showed that over 2.5 million middle and high school students currently use e-cigarettes. If smoking continues at the current rate among U.S. youth, 5.6 million of today's Americans younger than 18 years of age are expected to die prematurely from a smoking-related illness.

Purpose

The purpose of this project was to provide youth with evidence-based education in a classroom setting. The education was designed to increase participant knowledge about health-related concerns of ENDS products, decrease participant intent to use ENDS products, and foster sustainability through staff member CATCH My Breath training. Seventh grade students were educated using the CATCH My Breath vaping prevention program.



*Approved by CATCH My Breath

Results and Conclusions

Pre- and Post-Survey Results showed:

- The quantitative survey did not show any statistically significant changes
- Student responses appeared to be more truthful on the post-survey than the pre-survey, which skewed the results
- 84.5% of students that said that they learned something new during this education session
- 92.8% of students said that this education should be continued at their school

Qualitative Data:

- Students were able to write, draw, and discuss what they had learned during this program via assigned activities
- Students provided answers as to the importance of this education

Recommendations

- E-cigarette prevention education is important for youth to help combat the e-cigarette epidemic among youth
- Objective focused pre- and post-surveys with hard stops on each question to ensure accurate results
- Shorter education time and shorter survey
- Education taught by trusted faculty at the school to ensure rapport and in turn allow students to provide honest answers to questions

APPENDIX C: PRE-IMPLEMENTATION SURVEY

1. Do any of the following people in your household use e-cigarettes? (Check all that apply)
 - Mother/Female guardian
 - Father/male guardian
 - Grandparents
 - Other (for example, brother or sister)
 - No one in my house uses e-cigarettes

2. Do any of the following people in your household smoke cigarettes? (Check all that apply)
 - Mother/Female guardian
 - Father/male guardian
 - Grandparents
 - Other (for example, brother or sister)
 - No one in my house smokes cigarettes

3. How many of your close friends use e-cigarettes?
 - None of them
 - Some of them
 - Most of them
 - All of them

4. How many of your close friends smoke cigarettes?
 - None of them
 - Some of them
 - Most of them
 - All of them

5. Have you ever used an electronic cigarette, even once? This includes JUUL, Puff Bar, vape pens, mods, or any other type of e-cigarette.
 - No
 - Yes

6. Have you ever been curious about using an e-cigarette?
 - Definitely yes
 - Probably yes
 - Probably not
 - Definitely not

7. Do you think that you will try an e-cigarette soon?
 - Definitely yes
 - Probably yes
 - Probably not
 - Definitely not

8. If one of your best friends were to offer you an e-cigarette, would you use it?

- Definitely yes
- Probably yes
- Probably not
- Definitely not

9. During the past 30 days, on how many days did you use an e-cigarette?

- 0 days
- 1 or 2 days
- 3 to 5 days
- 6 to 9 days
- 10 to 19 days
- 20 to 29 days
- All 30 days

10. How often do you currently use an e-cigarette or vaping device?

- Daily or almost daily
- Less than daily but at least weekly
- Less than weekly but at least once a month
- Once in a while
- I do not currently use an e-cigarette or vaping device

11. Have you ever smoked or used ANY of the following tobacco products? This does not include electronic cigarettes. (Check all that you have ever used).

- Cigarettes
- Cigars, including cigarillos and little filtered cigars
- Smokeless tobacco, including chew, snuff, and snus
- Hookah or waterpipe
- Any other tobacco product
- None of them

12. During the past 30 days, have you smoked or used any of the following tobacco products? This does not include electronic cigarettes. (Check all that you have ever used).

- I have not used tobacco in the past 30 days
- Cigarettes
- Cigars, including cigarillos and little filtered cigars
- Smokeless tobacco, including chew, snuff, and snus
- Hookah or waterpipe
- Any other tobacco product

Knowledge

The following questions are about what you know about e-cigarettes. Try to answer each question the best you can. You do not have to use e-cigarettes to answer these questions.

13. E-cigarettes contain harmful chemicals like nicotine.

- True
- False
- I don't know

14. Nicotine can change the way your brain works (addiction).

- True
- False
- I don't know

15. When you are addicted to e-cigarettes, it means you cannot stop using e-cigarettes.

- True
- False
- I don't know

16. Using e-cigarettes can harm many parts of your body.

- True
- False
- I don't know

17. Advertisements about e-cigarettes are meant to make young people use them.

- True
- False
- I don't know

18. How much nicotine is in a JUUL compared to other e-cigarettes?

- More than other e-cigarettes
- About the same
- Less than other e-cigarettes
- I don't know

19. Teens who are younger than 18 years can use e-cigarettes.

- True
- False
- I don't know

How much do you agree with the following statements?

20. Most students in my middle school use e-cigarettes.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

21. Most students my age use e-cigarettes.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

22. Most kids in high school use e-cigarettes.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

If I were to use an e-cigarette or vaping device...

23. I would like it.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

24. I would enjoy the taste.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

25. I would feel less stressed.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

26. I would have fun using it with my friends.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

27. I would be more popular.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

29. I would worry about my health.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

30. I would get addicted.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

31. I would get in trouble with my teachers.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

32. I would let my parents down.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

33. My friends would avoid me.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

34. I would be a bad role model.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

The following questions ask how important it is to others that you do not use e - cigarettes.

35. How important is it to my parents that I do not use e-cigarettes?

- Extremely important
- Very important
- Slightly important
- Not at all important

37. How important is it to my friends that I do not use e-cigarettes?

- Extremely important
- Very important
- Slightly important
- Not at all important

38. How important is it to most people my age that I do not use e-cigarettes?

- Extremely important
- Very important
- Slightly important
- Not at all important

39. How important is it to my teachers that I do not use e-cigarettes?

- Extremely important
- Very important
- Slightly important
- Not at all important

If you were offered an e-cigarette, how easy would it be for you to...

40. Simply say no

- Very easy
- Easy
- Difficult
- Very difficult

41. Suggest something else to do

- Very easy
- Easy
- Difficult
- Very difficult

42. Avoid the situation (for example, hanging out with friends that do not use e-cigarettes)

- Very easy
- Easy
- Difficult
- Very difficult

43. Give your reason for not wanting to use an e-cigarette

- Very easy
- Easy
- Difficult
- Very difficult

45. Just leave the situation

- Very easy
- Easy
- Difficult
- Very difficult

How much do you agree with the following statements?

46. E-cigarette companies often exaggerate claims made about their products.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

47. E-cigarette ads tell only the good things about products.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

***Permission was granted from CATCH My Breath (CATCH, 2022)**

APPENDIX D: POST-IMPLEMENTATION SURVEY

1. Do any of the following people in your household use e-cigarettes? (Check all that apply)
 - Mother/Female guardian
 - Father/male guardian
 - Grandparents
 - Other (for example, brother or sister)
 - No one in my house uses e-cigarettes

2. Do any of the following people in your household smoke cigarettes? (Check all that apply)
 - Mother/Female guardian
 - Father/male guardian
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 - Other (for example, brother or sister)
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 - None of them
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5. Have you ever used an electronic cigarette, even once? This includes JUUL, Puff Bar, vape pens, mods, or any other type of e-cigarette.
 - No
 - Yes

6. Have you ever been curious about using an e-cigarette?
 - Definitely yes
 - Probably yes
 - Probably not
 - Definitely not

7. Do you think that you will try an e-cigarette soon?
 - Definitely yes
 - Probably yes
 - Probably not
 - Definitely not

8. If one of your best friends were to offer you an e-cigarette, would you use it?

- Definitely yes
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- Probably not
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9. During the past 30 days, on how many days did you use an e-cigarette?

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24. I would enjoy the taste.

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- Agree
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- Difficult
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41. Suggest something else to do

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42. Avoid the situation (for example, hanging out with friends that do not use e-cigarettes)

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- Very difficult

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How much do you agree with the following statements?

46. E-cigarette companies often exaggerate claims made about their products.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

47. E-cigarette ads tell only the good things about products.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

48. Do you feel like you learned something new during our four educational sessions?

- Yes
- No

49. If yes, what did you think was most beneficial? (Please type answer)

50. Would you recommend this education to be continued in the school?

- Yes
- No

51. Why or why not? (Please type answer)

52. Any recommendations how to make this education better? (Please type answer)

*Permission was granted from CATCH My Breath (CATCH, 2022)

APPENDIX E: CATCH MY BREATH POWERPOINT



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**Vaping & Your Life:
A Guide To Making
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EDUCATION

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*Permission was granted from CATCH My Breath (CATCH, 2022)

APPENDIX F: APPROVAL TO USE IOWA MODEL



○ Kimberly Jordan - University of Io...

Today at 11:47 AM

To:  Watterson, Morgan

You have permission, as requested today, to review and/or reproduce *The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care*. Click the link below to open.

[Iowa Model - 2015.pdf](#)

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Reference: Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing*, 14(3), 175-182. doi:10.1111/wvn.12223

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Please contact UIHCNursingResearchandEBP@uiowa.edu or 319-384-9098 with questions.

APPENDIX G: APPROVAL TO USE CATCH MY BREATH CURRICULUM AND RESOURCES

Terms of Use

EN ESPAÑOL

Welcome to the CATCH.org Website

Welcome to the CATCH Global Foundation ("Us" or "Our" or "We") CATCH.org Website

– and thank You for visiting. We hope You enjoy the experience!

These Terms of Use ("Terms") are a legal contract between You and Us (collectively, "Everyone") and govern Your use of all the text, data, information, software, graphics, photographs and more (all of which We refer to as "Materials") that We and Our affiliates may make available to You, as well as any services ("Services") We may provide through any of Our websites (all of which are referred to in these Terms as this "Website").

APPENDIX H: ADOLSCENT ASSENT LETTER



NDSU Nursing
1401 Albrecht Blvd
Fargo, ND 58108-6050
(701) 231-7395

CHILD ASSENT FORM

I am Morgan Watterson from North Dakota State University. I am doing a study to figure out if increased education regarding the adverse effects of electronic nicotine delivery system (ENDS) use will decrease an adolescent's intent to use them. We are asking you to take part in the research study because the data from this survey will be used to help kids your age all over the country.

For this research, we will be asking you to complete a pre- and post- survey in your scheduled class period along with participating in four classroom based educational sessions. We will keep all your answers private and will not show them to your teacher or parent(s)/guardian. Only people from NDSU working on the study will see them.

The risks are minimal to you regarding your participation in this study. You may be worried about your classmates seeing your answers to your surveys, but we will do our best to avoid this by allowing you to turn your computers or desks from other students. You may also be worried about your information getting out to your parents/guardians, teachers, or authorities, but you will complete the survey with a special code given to you that only you will know and only myself and the NDSU statisticians will be looking at the direct answers you submit.

There are many benefits to you regarding your participation. You will feel good about submitting information that in turn can help other students your age. You will receive evidence-based information regarding the adverse effects of ENDS products and can make an informed decision regarding your intent to use them.

You should know that:

- You do not have to be in this study if you do not want to. You won't get into any trouble with NDSU, your teacher, or the school if you say no.
- You may stop being in the study at any time. Also, if there is a question you don't want to answer, just leave it blank.
- Your parent(s)/guardian(s) were asked if it is OK for you to be in this study. Even if they say it's OK, it is still your choice whether or not to take part.
- You can ask any questions you have, now or later. If you think of a question later, you or your parents can contact me at Morgan.Watterson@ndsu.edu.

Complete this survey only if you:

- have understood what you will be doing for this study,
- have had all your questions answered,
- have talked to your parent(s)/legal guardian about this project, and
- agree to take part in this research

*To continue and take the survey, click the arrow to go to the next page. If you do not want to do the survey, just close out of this window now.

APPENDIX I: PARENTAL CONSENT LETTER



NDSU Nursing
1401 Albrecht Blvd
Fargo, ND 58108-6050
(701) 231-7395

Initiation of an Adolescent School-Based Electronic Nicotine Delivery System Prevention Program

Parent/Guardian Permission Form

This study is being conducted by: The co-investigator, Morgan Watterson, a current 2nd year Doctor of Nursing Practice student at North Dakota State University (NDSU), who will be implementing her graduate dissertation at Kindred High School. Her advisor and the principal investigator is Mykell Barnacle, DNP, FNP-BC, who is an instructor at NDSU. Morgan can be contacted via email at Morgan.Watterson@ndsu.edu and Mykell can be contacted via email at Mykell.Barnacle@ndsu.edu. Please feel to reach out to regarding any questions you may have.

Why is my child being asked to take part in this study?

The purpose of this project is to provide youth with evidence-based education in a classroom setting in hopes of reducing their intent to use ENDS products. There will be a pre- and post-evaluation to assess for increased knowledge regarding ENDS use and decreased intent to use an ENDS product. CATCH My Breath is a school-based program that provides education to help prevent the use of ENDS in youth. My project will be specific to 12–13-year-olds who are in seventh grade at Kindred High School. Your child is being asked to participate in this study to help analyze results of this curriculum and determine if this curriculum should be continued at Kindred High School following this semester. The overall goal of this project is to reduce ENDS product use in youth leading to decreased risk of health problems or death associated with use of tobacco products.

What will my child be asked to do?

Your child will be asked to complete a pre-survey one week before the implementation of the curriculum. The curriculum will be taught via the co-investigator, Morgan, on March 22nd, March 29th, April 5th, and April 12th during one of their scheduled class periods. During the curriculum they will be asked to participate in group work and lectures pertaining to ENDS use. One week following the implementation of the curriculum, they will be asked to complete a post-survey. If your child experiences serious distress or discomfort during participation, Students will be referred to counseling or personal health care provider if needed. If resources outside of school are needed, students will be responsible for the cost and personal insurance will be billed.

Where is the study going to take place, and how long will it take?

The study will take place at Kindred High School during your child's scheduled class periods. The program consists of four 35-45 minute in person classroom sessions that will occur in a four-week period of time. The pre- and post- surveys will take 10-15 minutes to complete and will be done during their scheduled class periods.

Does my child have to take part in this study?

Your child does not have to take part in this study. They will be given information regarding this study before they take the pre-survey, which allows them to not participate in the survey, not participate in the curriculum, and stop participating at any time. If they decide to not participate, there will be no penalty.

What are the alternatives to being in this study?

If you choose to opt your child out of this study or they decide not to participate, they will be given an alternative activity to do during this time, but they are required by the school to be present during their scheduled class time.



Who will have access to my child's information?

The co-investigator will have access to your child's survey information, however, will not know whose survey is whose. The survey does not ask any personal identifying questions and the students will be using a "code" that only they will know. The code will allow the co-investigator to compare the pre- and post- surveys but will not be applied to any student directly. The co-investigator will be utilizing the NDSU statisticians to help determine if her project is beneficial or not, but they will not have access to student information. No personal identifying information will be given to Kindred High School, guardians, or authorities.

Can my child's participation in the study end early?

Any student can stop participating in this study at any time without consequence. There is no other reason they will not be able to participate.



What if we have questions?

Before you decide whether your child may participate in this study, please ask any questions that come to mind. If you or your child has questions about the study, you can contact the principal investigator via email at Mykell.Barnacle@ndsu.edu, or the co-investigator via email at Morgan.Watterson@ndsu.edu.

What are my child's rights as a research participant?

Your child has rights as a research participant. All research with human participants is reviewed by a committee called the *Institutional Review Board (IRB)* which works to protect participant's rights and welfare. If you have questions about your child's rights, an unresolved question, a concern, or complaint about this research you may contact the IRB office at 701.231.8995, toll-free at 855-800-6717 or via email (ndsu.irb@ndsu.edu).

Documentation of Passive Consent:

-If you wish for your child to not participate in this electronic nicotine delivery systems curriculum, please email Mr. Packer this request or fill out the below opt-out form and have your child bring it to class. Please reply within 1 week from the email sent date if you wish to opt your child out. If a response is not heard by then, it will be assumed that your child is able to participate.

Student Participation Opt-Out Form

I do not want my child to participate in the CATCH My Breath curriculum.

Child's Name: _____

Parent or Guardian Name (please print): _____

Parent or Guardian Signature: _____

APPENDIX J: QUESTIONNAIRE ACTIVITY

Activity 4a: Your Life. Your Choice.

STUDENT HANDOUT

Now that you've learned so much about tobacco products, how to refuse them, and how some people get tricked into using them, reflect on the three "whats" of the program.

WHAT?

What did you learn about how e-cigarettes can affect your health, social life, finances, environment, and goals?

It can affect your health with lung disease, cancers, worsening asthma. It's very expensive and can cause financial issues.



SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

It showed me ways to avoid peer pressure if someone asks to try it. It also warned me about the health risks.



Vaping hurts

WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

If I am offered it I will say no and find something else to do. I will also educate others.



more than help



BeVapeFree.org 67

Activity 4a: Your Life. Your Choice.

STUDENT HANDOUT

Now that you've learned so much about tobacco products, how to refuse them, and how some people get tricked into using them, reflect on the three "whats" of the program.

WHAT?

What did you learn about how e-cigarettes can affect your health, social life, finances, environment, and goals?

You are ingesting tons of chemicals, and they aren't good for your body, people may not want to be around you if you get caught, you could miss out on opportunities like getting a scholarship or being asked to be on a sports team.



SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

To learn the consequences about what vaping does to you, and to learn what others might think of you and how it affects your opportunities.



WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

I will politely refuse or exit, and I will encourage others not to do it.



CATCH
MY BREATH

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Activity 4a: Your Life. Your Choice.

Now that you've learned so much about tobacco products, how to refuse them, and how some people get tricked into using them, reflect on the three "whats" of the program.

WHAT?

What did you learn about how e-cigarettes can affect your health, social life, finances, environment, and goals?

It can alter your brain. It can get you addicted really easily. It can cause depression, anxiety, and make you lose important things in your life.



SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

It's important, because it teaches us how bad it get be, and influences us to not do it. It can affect our life by helping us be more aware of the concept.



WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

I am going to be more aware of it, and realize it in other people, so that I can help them. I will inform other people about the concept, so they don't do it.



Activity 4a: Your Life. Your Choice.

STUDENT HANDOUT

Now that you've learned so much about tobacco products, how to refuse them, and how some people get tricked into using them, reflect on the three "whats" of the program.

WHAT?

What did you learn about how e-cigarettes can affect your health, social life, finances, environment, and goals?

I learned that e-cigarettes cause anxiety, depression, addiction, and pushes away your friends + family along with your grades.



SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

I think its important because people shouldn't use e-cigarettes and these videos have shown how they are bad. It affects friends, family and your health.



WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

I will just say no, knowing I am vape free and don't ever want to try it. I can't control what other people do but we can try to convince them not to vape.



CATCH
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BE VAPÉ FREE

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67



Activity 4a: Your Life. Your Choice.

Now that you've learned so much about tobacco products, how to refuse them, and how some people get tricked into using them, reflect on the three "whats" of the program.

WHAT?

What did you learn about how e-cigarettes can affect your health, social life, finances, environment, and goals?

I learned that e-cigarettes affect how you do in school and your grades.



SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

It is important so that we don't fall into addiction and so we can be aware of how harmful it is.

It can affect what colleges we get into and our family.



WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

I will ask Jesus to help me, and if someone offers it, then I will say no.



Activity 4a: Your Life. Your Choice.

STUDENT HANDOUT

Now that you've learned so much about tobacco products, how to refuse them, and how some people get tricked into using them, reflect on the three "whats" of the program.

WHAT?

What did you learn about how e-cigarettes can affect your health, social life, finances, environment, and goals?

That it can cause you to be stressed, angry, and become distant to everyone you know



SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

Because if you make the choice to vape it will affect your whole future



WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

Avoid situations where there could be dangerous products



CATCH
MY BREATH

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APPENDIX K: SOCIAL MEDIA POST ACTIVITY

STUDENT HANDOUT



BeVapeFree.org 62

 **Be_Vape_Free** ...

Outside



Inside





Be_Vape_Free

Vaping shouldn't control you. Know the consequences.


 Be_Vape_Free...

Vaping is just
like throwing your life away.
Don't do it.



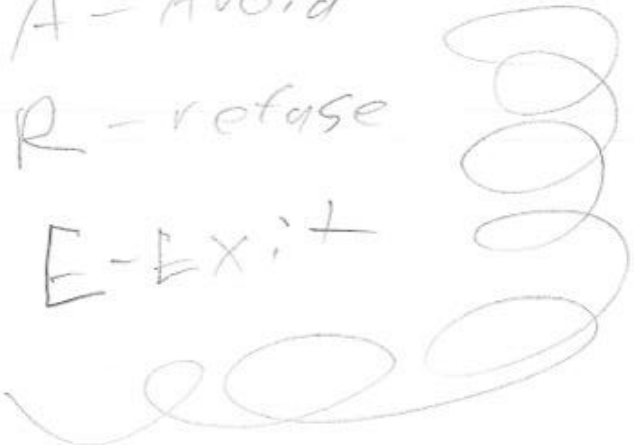
  





Be_Vape_Free

 Be_Vape_Free ...

ARE you serious

A - Avoid
R - refuse
E - Exit



Be_Vape_Free

Be_Vape_Free


Here, try it.

No! Its not good for your health

Be_Vape_Free





You should always say NO! to tobacco. #Vapefree #cool #Awsomesauce #Bebetter



 Be_Vape_Free ...



Vaping can affect Your
LIFE!

Be_Vape_Free

Vaping can affect your life and others around
you. Choose to say no to the temptations.

**APPENDIX L: TABLE 2 IF YES, WHAT DO YOU THINK WAS THE MOST
BENEFICIAL?**

| | |
|---|---|
| Learning the harms of vaping can save many lives and many young lives of people in this interesting generation of wacky people. Thx for teaching us not to vape and this probably helped many people not start to vape or it could help stop people from vaping. And again, thx for teaching us this difficult concept to understand about the harms of vaping and e-cigarettes | It can cause you stress |
| Hearing stories about the people who went through it | Not to vape |
| That it does not help your stress, it makes it worse | How addictive it can be |
| Videos telling you the bad outcomes or videos of other kid's experiences | That only one puff can be a life changer |
| It is good to know that I shouldn't vape | Knowing that vaping can ruin a life |
| The things that could happen to you if you did vape | I think the most beneficial thing we learned was the possible consequences and problems that it can cause |
| I learned to never smoke because it will ruin my health and future | I think the most beneficial thing was the peer pressure part |
| Learning what's in the stuff | Because before I didn't know how much of a harm, they are to your body |
| The fact that I learned that vapes make you more stress than before, and that it can affect all parts of your body | It has nicotine |
| All the vapes are bad | That vaping can do bad thing to your brain |
| What effect it has on your body | Learning everything that can go wrong when you use them |
| Learning that they are bad for you | I think watching the videos and getting a visual of what could happen if you use a vape |
| The consequences of using a vape | Anything with tobacco or nicotine can cause lung cancer or you can get more stressed than you already are |
| There are metal and bed chemicals in smoking products | To not use cigarettes or vape products if you want to live a good life and be a healthy person |
| How dangerous they are | Saying no and leaving a situation where I am offered a vaping device |
| Knowing that companies only say the good things about their products | That addiction is serious |

| | |
|---|--|
| Knowing that what's in it isn't water vapor and every single part of it is not good for you and for no reason should I use it for the risk of ruining my life | I learned how addictive vaping and e-cigarettes can be and multiple reasons why you should avoid them. |
| Knowing what it can do to our health | Ways to say no |
| To not use e-cigarettes or cigarettes | How much nicotine is in vapes |
| E-cigarettes control the rest of your body too | |
| How bad vaping really is | |
| That it can hurt you if you vape | |

APPENDIX M: TABLE 3 WHY OR WHY NOT?

| | |
|--|--|
| Giving students a class of this would be very helpful to help people quit and not start vaping. Thx so much. | Yes, because teenagers like me need to know why not to use it and to make the right choice |
| It is useful | Yes, because it helps influence kids to not do the things we learned about |
| It is very important | Yes, because people need to know they're bad |
| Yes, because its good and will decrease the population that does it | Yes, because maybe some kids who do this don't know how dangerous it really is |
| It shows the real side of vaping | Because it can be useful for people that don't know about nicotine, etc. |
| It does not seem interesting | It is good for everyone |
| It is a good thing to know | Kids should know about this |
| Because people shouldn't vape | I think it teaches us not to use them |
| It is important | It is good that kids know how important it is |
| Because people will be sick | It is important for people to know the consequences of vaping |
| To warn people about the effects | It was very helpful, so I know not to use it at all |
| It is good information | Because I do not care |
| Because we already know | Cause it educates kids, so they stay healthy and don't get addicted |
| It is very educational | For some schools but not really others |
| To teach kids not to vape | Yes, because it can teach people not to smoke anything and treat their body good |
| So kids in our school don't get addicted to vaping | Yes, because it can teach people not to smoke anything and treat their body good |
| It makes me not want to vape | It would be nice for kids to know what is right and what is wrong |
| It helps you understand | It may help someone not vape |
| Because it is boring | Yes, because mostly teens are e cig users |
| So people don't end up getting infections or harmful things in their body | |
| I would because I think we learned a lot and it could help prevent vaping or smoking | |
| It helped to make it more clear | |
| Yes, because it teaches kids what actually is in vapes | |

**APPENDIX N: TABLE 4 ANY RECOMMENDATIONS ON HOW TO MAKE THIS
EDUCATION BETTER?**

| | |
|---|--|
| Watch more people tell you how bad it is and how harmful it can be | More videos |
| No (lots of no answers) | Make it a little less boring |
| Do more hands-on learning | Try playing games or something fun to make it more interesting |
| Make it more fun | Giving examples and photos of what could happen to your body |
| Its good | Add a section on vapes and tobacco products in class |
| It was great | To really exaggerate the harmfulness |
| Talk about people that have smoked longer than a few years so people can see how heavily it effects their brain | Maybe have a fake e-cigarette so kids can picture in their minds what you're talking about |
| Make it a little bit more interesting | Tell them how many people have died from an e-cigarette |
| Let us play games during it | I think it was good |
| I like how it was | |
| I think that adding more activities would be helpful | |
| Probably nothing, good experience | |
| Maybe some more hands on things to do with the students | |
| Get the students more involved somehow | |
| Do more fun activities and not lecturing so much | |
| Add specifics of different vapes | |

APPENDIX O: DISSEMINATION OF RESULTS TO KINDRED HIGH SCHOOL VIA EMAIL

Recommendations for CATCH My Breath Curriculum

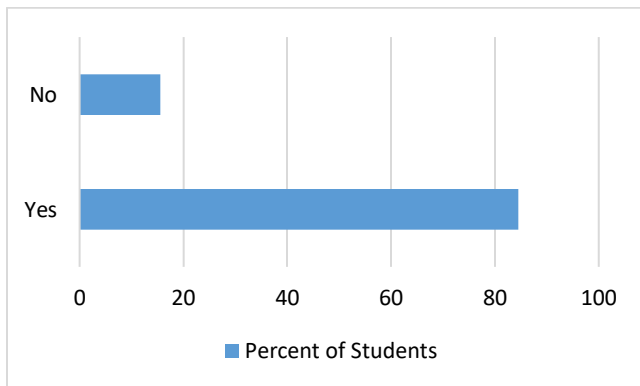
The purpose of this project was to provide youth with evidence-based education in a classroom setting in hopes of reducing their intent to use electronic nicotine delivery system (ENDS) products. Seventh-grade students were taught the CATCH My Breath curriculum over a four-week period. One week before initiation of this project, the students were given a pre-survey to analyze their prior knowledge of ENDS products and their current use or intent to use ENDS products. One week after finishing the CATCH My Breath curriculum, the students completed a post-survey to analyze their knowledge of ENDS products and their current use or intent to use ENDS products after being provided with evidence-based education.

While the literature continues to show the importance of e-cigarette prevention education in youth, I could not verify if the CATCH My Breath curriculum increased students' knowledge or decreased their intent to use. For a variety of reasons, my survey results were skewed. Some of these reasons were related to the students' previous knowledge, the small number of students' currently using e-cigarettes, the students' hesitation to be honest, and the survey possibly asking the wrong questions or being too long.

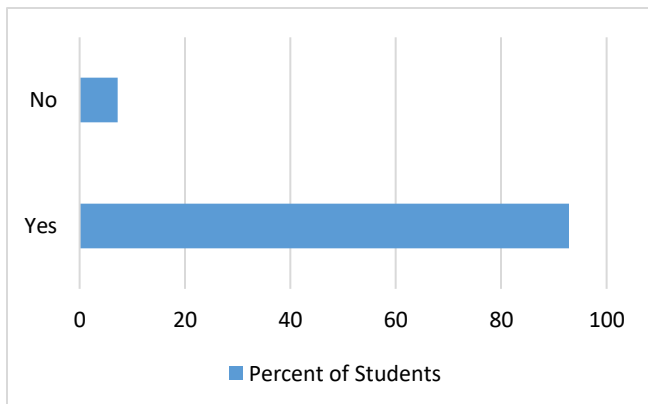
While my quantitative results were insignificant, I was very reassured by students' participation, their in-class activities, and their yes/no and open-ended question answers on the post-survey. There were 84.5% of students that said that they learned something new during this education and 92.8% of students said that this education should be continued at their school. In addition to this, many students were able to give examples of what they learned and further recommendations. I attached some of their completed activities below along with their answers

to the above questions. I cannot say that the CATCH My Breath program was beneficial at your school 100% based off my quantitative results, however, students seemed to have positive feedback regarding this prevention program. In addition, the literature still encourages e-cigarette prevention education to youth in a classroom setting to help decrease students' intent to use e-cigarettes and in turn decrease morbidity and mortality from tobacco products. Megan Blessum did get CATCH My Breath certification on my final day at Kindred High School. It is up to your discretion whether you continue using this program or begin teaching a different curriculum, but my overall recommendation is that some e-cigarette prevention program is taught to students in either 7th or 8th grade. The students could verify that many high school students were already using them, so the goal would be to give this education before they begin to use e-cigarettes.

Do you feel you learned something new during our four educational sessions?



Would you recommend this education be continued in the school?



Activity 4a: Your Life. Your Choice.

Now that you've learned so much about tobacco products, how to refuse them, and how some people get tricked into using them, reflect on the three "whats" of the program.

WHAT?

What did you learn about how e-cigarettes can affect your health, social life, finances, environment, and goals?

It can affect your health with lung disease, cancers, worsening asthma. It's very expensive and can cause financial issues.



SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

It showed me ways to avoid peer pressure if someone asks to try it. It also warned me about the health risks.



WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

If I am offered it I will say no and find something else to do. I will also educate others.



BE VAPÉ FREE

BeVapeFree.org 67

Activity 4a: Your Life. Your Choice.

STUDENT HANDOUT

Now that you've learned so much about tobacco products, how to refuse them, and how some people get tricked into using them, reflect on the three "whats" of the program.

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You are ingesting tons of chemicals, and they aren't good for your body, people may not want to be around you if you get caught, you could miss out on opportunities like getting a scholarship or being asked to be on a sports team.



SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

To learn the consequences about what vaping does to you, and to learn what others might think of you and how it affects your opportunities.



WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

I will politely refuse or exit, and I will encourage others not to do it.



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MY BREATH

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SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

It's important, because it teaches us how bad it get be, and influences us to not do it. It can affect our life by helping us be more aware of the concept.



WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

I am going to be more aware of it, and realize it in other people, so that I can help them. I will inform other people about the concept, so they don't do it.



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I think its important because people shouldn't use e-cigarettes and these videos have shown how they are bad. It affects friends, family and your health.



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Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

I will just say no, knowing I am vape free and don't ever want to try it. I can't control what other people do but we can try to convince them not to vape.



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I learned that e-cigarettes affect how you do in school and your grades.



SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

It is important so that we don't fall into addiction and so we can be aware of how harmful it is.

It can affect what colleges we get into and our family.



WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

I will ask Jesus to help me, and if someone offers it, then I will say no.



Activity 4a: Your Life. Your Choice.

STUDENT HANDOUT

Now that you've learned so much about tobacco products, how to refuse them, and how some people get tricked into using them, reflect on the three "whats" of the program.

WHAT?

What did you learn about how e-cigarettes can affect your health, social life, finances, environment, and goals?

That it can cause you to be stressed, angry, and become distant to everyone you know



SO WHAT?

Why is it important that you learned this? How does it affect you and your life?

Because if you make the choice to vape it will affect your whole future



WHAT NOW?

Now that you have this information, what are you going to do about it? How will you avoid, refuse, or exit if someone offers you an e-cigarette? What are you going to do to prevent others from picking up the habit?

Avoid situations where there could be dangerous products



CATCH
MY BREATH

BE VAPÉ FREE

BeVapeFree.org 67

 Be_Vape_Free ...



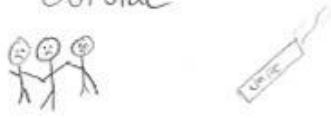
   

Be_Vape_Free

It is more healthy
to smoke from the
exhaust of a car than
a cigarette. Would you
do it?


 **Be_Vape_Free** ...

Outside



Inside






Be_Vape_Free

Vaping shouldn't control you. Know the consequences.


 Be_Vape_Free...

Vaping is just
like throwing your life away.
Don't do it.



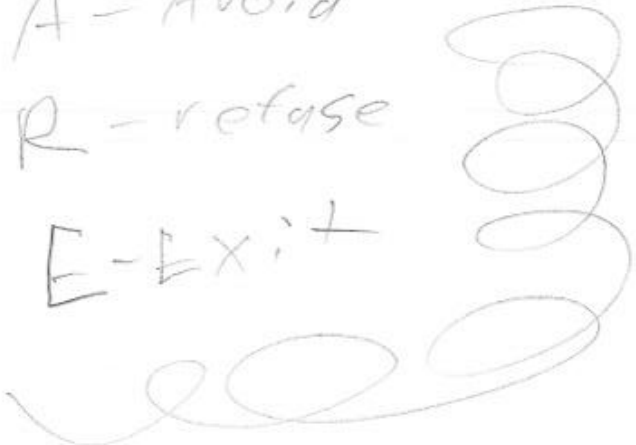
  





Be_Vape_Free

 Be_Vape_Free ...

ARE you serious

A - Avoid
R - refuse
E - Exit



Be_Vape_Free

Be_Vape_Free

Here, try it.


No! Its not good for your health

Be_Vape_Free




You should always say NO! to tobacco. #Vapefree #cool #Awsomesauce #Bebetter



 Be_Vape_Free...



Vaping can affect Your
LIFE!

Be_Vape_Free

Vaping can affect your life and others around
you. Choose to say no to the temptations.

WHAT DO YOU THINK WAS THE MOST BENEFICIAL?

| | |
|---|--|
| Learning the harms of vaping can save many lives and many young lives of people in this interesting generation of wacky people. Thx for teaching us not to vape and this probably helped many people not start to vape or it could help stop people from vaping. And again, thx for teaching us this difficult concept to understand about the harms of vaping and e-cigarettes | It can cause you stress |
| Hearing stories about the people who went through it | Not to vape |
| That it does not help your stress, it makes it worse | How addictive it can be |
| Videos telling you the bad outcomes or videos of other kid's experiences | That only one puff can be a life changer |
| It is good to know that I shouldn't vape | Knowing that vaping can ruin a life |
| The things that could happen to you if you did vape | I think the most beneficial thing we learned was the possible consequences and problems that it can cause |
| I learned to never smoke because it will ruin my health and future | I think the most beneficial thing was the peer pressure part |
| Learning what's in the stuff | Because before I didn't know how much of a harm, they are to your body |
| The fact that I learned that vapes make you more stress than before, and that it can affect all parts of your body | It has nicotine |
| All the vapes are bad | That vaping can do bad thing to your brain |
| What effect it has on your body | Learning everything that can go wrong when you use them |
| Learning that they are bad for you | I think watching the videos and getting a visual of what could happen if you use a vape |
| The consequences of using a vape | Anything with tobacco or nicotine can cause lung cancer or you can ge4t more stressed than you already are |
| There are metal and bed chemicals in smoking products | To not use cigarettes or vape products if you want to live a good life and be a healthy person |
| How dangerous they are | Saying no and leaving a situation where I am offered a vaping device |
| Knowing that companies only say the good things about their products | That addiction is serious |
| Knowing that what's in it isn't water vapor and every single part of it is not good for you and for | I learned how addictive vaping and e-cigarettes can be and multiple reasons why you should avoid them. |

| | |
|---|-------------------------------|
| no reason should I use it for the risk of ruining my life | |
| Knowing what it can do to our health | Ways to say no |
| To not use e-cigarettes or cigarettes | How much nicotine is in vapes |
| E-cigarettes control the rest of your body too | |
| How bad vaping really is | |
| That it can hurt you if you vape | |

SHOULD THIS EDUCATION BE CONTINUED: WHY OR WHY NOT?

| | |
|--|--|
| Giving students a class of this would be very helpful to help people quit and not start vaping. Thx so much. | Yes, because teenagers like me need to know why not to use it and to make the right choice |
| It is useful | Yes, because it helps influence kids to not do the things we learned about |
| It is very important | Yes, because people need to know they're bad |
| Yes, because its good and will decrease the population that does it | Yes, because maybe some kids who do this don't know how dangerous it really is |
| It shows the real side of vaping | Because it can be useful for people that don't know about nicotine, etc. |
| It does not seem interesting | It is good for everyone |
| It is a good thing to know | Kids should know about this |
| Because people shouldn't vape | I think it teaches us not to use them |
| It is important | It is good that kids know how important it is |
| Because people will be sick | It is important for people to know the consequences of vaping |
| To warn people about the effects | It was very helpful, so I know not to use it at all |
| It is good information | Because I do not care |
| Because we already know | Cause it educates kids, so they stay healthy and don't get addicted |
| It is very educational | For some schools but not really others |
| To teach kids not to vape | Yes, because it can teach people not to smoke anything and treat their body good |
| So kids in our school don't get addicted to vaping | Yes, because it can teach people not to smoke anything and treat their body good |
| It makes me not want to vape | It would be nice for kids to know what is right and what is wrong |
| It helps you understand | It may help someone not vape |
| Because it is boring | Yes, because mostly teens are e cig users |
| So people don't end up getting infections or harmful things in their body | |
| I would because I think we learned a lot and it could help prevent vaping or smoking | |
| It helped to make it more clear | |
| Yes, because it teaches kids what actually is in vapes | |