Promising and Best Practices in School-Based Drug Prevention: Evaluation of the Emily's Hope Pilot Curriculum

April 2024

— A Beacom Research Fellows Report | Augustana Research Institute

Commissioned by Emily's Hope

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This report was made possible by a gift from Miles and Lisa Beacom to support the Beacom Research Fellows Program at Augustana University. The Beacom Research Fellows Program partners Augustana students with community organizations to complete collaborative research projects on behalf of the organization. Fellows make rigorous research, data management, analysis, and reporting more broadly available to organizations in the Sioux Falls area that are working to improve the quality of life.

Table of Contents

Part 1: Evaluation Findings

Introduction

School-based substance abuse prevention is important and impactful, and to be most effective, it should be introduced early in a child's education before unwanted behavior or experimentations are undertaken. Considering that drug use and experimentation start at the middle school level, prevention efforts should start at the elementary school level. However, there are not as many substance use prevention curricula that operate at the elementary school level compared to those that operate at the middle and high school levels. Using quantitative and qualitative methods, such as surveys and interviews, as well as a review of the literature, this report evaluates the pilot implementation of the Emily's Hope drug prevention curriculum in third and fourth-grade classrooms in nine South Dakota and Minnesota elementary schools. Mixed method analysis of the curriculum found statistically significant success in the pilot program and room for improvement as the curriculum is expanded into more schools and grade levels.

Literature Review

Drug abuse and overdose have become a national health emergency as over 932,000 Americans have died of an overdose in the past 21 years, and this negative trend continues (CDC, 2022). In 2019, approximately 70,630 Americans died from drug abuse. This number increased by 31% in 2020 as 91,799 deaths were caused

by an overdose (CDC, 2022b). In 2021, the number of overdose deaths rose to a record high as 106,699 Americans died of an overdose (NIDA, 2023).

This trend remains consistent among adolescents in the United States as teenage, 14 to 18-year-olds, overdose-related deaths have increased by 94% from 2019 to 2020 and by 20% from 2020 to 2022 (Tanz et al., 2022). This increase is due to the high availability of fentanyl and counterfeit pills, as well as easy access to such drugs through social media contacts. Although overall illicit drug use has decreased in the past decade (Hoots et al., 2023), the number of teenagers, aged 12-17, using illicit drugs remains high with 3.7 million adolescents reported using drugs in 2021 (SAMHSA, 2022a). In contrast to overall trends in illicit drug use, opioid use among adolescents has been increasing. For instance, in 2021, 259,000 teenagers were diagnosed with Opioid Use Disorder (SAMHSA, 2022a) compared to 122,000 teenagers in 2015 (Markiewicz et al., 2017). Additionally, the overall population of teenagers aged 12 to 17 diagnosed with a Substance Use Disorder (SUD) has risen from 1.6 million in 2020 (SAMHSA, 2021) to 2.2 million in 2021 (SAMHSA, 2022a). Therefore, despite an overall decrease in drug use, drug use remains highly prevalent, and is increasingly dangerous.

One significant reason for the persistent use and misuse of substances among youth is a lack of education. For instance, one in four teenagers believes that prescription drugs, including those that are not personally prescribed, can be used as a study aid (SAMHSA,2022b). The National Institute on Drug Abuse (NIDA) has stated that: “When young people view drug use as harmful, they tend to decrease their drug taking” (NIDA, 2018). Therefore, education is a key element in preventing drug addiction and correcting the misconceptions that lead to drug use and abuse.

Evidence-based Prevention Literature

Many children are at risk of being exposed to drugs and developing substance abuse disorder at the beginning of their middle school career. In 2019, the Substance Abuse and Mental Health Service Administration (SAMHSA) found that about 10% of kids aged 12 to 13, had either tried tobacco, alcohol, or other substances in the last year (SAMHSA, 2020). Research has also found that 70% of youth who try illegal drugs before the age of 13 "develop a substance abuse disorder within the next seven years" (NCDAS,2023). Still, roughly 3,300 children as young as 12 years old try marijuana every day, and approximately five out of ten children as young as 12 have had prescription drugs for nonmedical purposes (SAMHSA, 2022c).

Research has found that effective drug prevention programs must contain an "appropriately timed" element (Nation et al., 2003). This means that such programs must start before the unwanted behaviors are undertaken (Harrop and Catalano, 2016), hence the importance of starting drug education and prevention programs at the elementary school level to effectively prevent unwanted behaviors.

Unfortunately, evidence-based elementary drug prevention education is rare. Although there is no updated data on how many elementary schools include drug prevention curricula, a 2010 research study by the National Library of Medicine found that 75% of school districts reported teaching some type of drug prevention curricula at the elementary school level. Out of the 75%, only 35% reported utilizing any evidence-based curricula in at least one elementary school, and 14% reported using one curriculum more frequently than the others (Hanley et al., 2010). Although they are not widespread, prevention programs are operating at the elementary school level (Trembley et al., 2020). Furthermore, states such as

Maryland (Justicia, 2017), Massachusetts (Pettengill, 2018), and Connecticut (Justicia, 2012) require drug prevention curricula at the elementary school level.

Multiple studies have been done to outline elements of an effective and evidence-based drug prevention curriculum. For instance, a 1995 research study identified 11 elements of an effective drug prevention program (Dusenbury and Falco, 1995). Since then, decades of research have supported the elements outlined in this study. It is because of this relevance that the following portion of the review will utilize 10 out of the 11[1] outlined elements as the basis for the review of drug prevention literature at the school level.

Ten elements of effective drug prevention curriculum: What works with drug prevention.

- Research-Based and Theory Driven:

To be effective, prevention curricula must be based on the current theories of drug abuse prevention. Drug prevention initiatives need to understand the causes or risk factors, as well as protective factors when it comes to drug use (Dusenbury and Falco, 1995). Risk factors include but are not limited to genetic predisposition, parents who abuse drugs and alcohol, child abuse, poverty, violent neighborhoods, or even laws favorable to substance use (SAMHSA, 2019). Protective factors, on the other hand, include positive self-image, self-control, social competence, involved parents and communities, as well as laws less favorable to substance use. People with some risk factors are more likely to experience

[1] One element out of the 11 has been removed from this review as it comprises community and family-based-efforts that are not specifically relevant to school-based prevention curricula.

additional risk factors, hence the importance of early prevention education that targets multiple risk factors instead of one (SAMHSA, 2019).

- Developmentally Appropriate Information on Drugs:

Curricula must recognize that children and adolescents learn differently as they are more captivated by "concrete information and here-now experiences than they are by information on a possible distant future" (Dusenbury and Falco, 1995). Further research argues that for a curriculum to be effective, it must contain accurate and relevant information on the health and social risks associated with substance use in children and adolescents, not the effects of drugs on adults (Sloboda et al., 2019).

- Social Resistance Skills Training:

Social resistance skills training includes lessons that build and reinforce skills to resist peer pressure while maintaining friendships. In other words, Social Resistance skills training are lessons during which participants are taught how to respond to and deal with high-stress situations in the most effective way possible (Dusenbury and Falco, 1995). Furthermore, such training provides "counter-arguments to appealing but misleading messages" on drug use (Griffin and Botvin, 2010).

- Normative Education:

Normative education has been described as crucial in reducing drug use as it consists of lessons and activities that alter misconceptions about the prevalence of

drug use. Oftentimes, data on drug abuse is overstated to bring attention to the real issue of drug use. However, overstating the numbers and data on drug use rates will change the perception of youth on the social acceptability of drugs by leading them to assume that drug use is widespread, and therefore, socially acceptable. Research has suggested that an effective way to alter misconceptions and the perceived social acceptability of drugs is for prevention curricula to include drug use data in the children's direct environment. In short, normative education challenges the misconception that drugs are not as dangerous because a high number of the population uses them (Dusenbury and Falco, 1995; Griffin and Botvin, 2010).

- Broader-based Skills Training or Competence-Enhancement:

Broader-based skills training that includes decision-making skills, general social skills, assertive skills, stress and anxiety management, self-esteem, and self-control skills (Griffin and Botvin, 2011), as well as goal-setting skills, has had a slightly greater impact on drug prevention than "social skills training alone" (Dusenbury and Falco, 1995). Experts argue that programs that include broader-based skills training are effective because such training fosters social and academic competence which in turn reduces drug use. It has been proven that academic failure as early as elementary school is correlated with later drug use and abuse (Fothergill et al., 2008; Harrop and Catalano, 2016). Therefore, "early intervention with risk factors (e.g., aggressive behavior and poor self-control) often has a greater impact than later intervention by changing a child's life path" (Lee and Henry, 2022).

- Interactive Teaching Techniques:

Interactive teaching techniques have been identified as the most effective technique in teaching drug prevention curricula as lecturing alone has proven to be ineffective. Effective drug prevention curricula must include role-playing, discussion, and small group activities while promoting the active participation of students. Interactive teachings such as role-play provide children with the opportunity to practice the acquired knowledge and skills (Dusenbury and Falco, 1995; Nation et al., 2003).

- Teacher Training and Support:

Drug prevention programs are most successful when they are taught by trained teachers. Teacher training is crucial to the effectiveness of a drug prevention curriculum as high-quality, research-based programs can produce “disappointing results” if they are not taught by well-selected, highly-trained providers (Nation et al., 2003).

- Adequate Coverage and Sufficient Follow-up:

The impact of drug prevention curricula tends to fade if the provided material is not consistent and ongoing. The program intensity is measured not only by the quantity but also by the quality of the lessons. This can also be measured by “the session length, number of sessions, spacing of sessions, and the duration of the total program” (Nation et al., 2003). Children are exposed to other ongoing influences. Therefore, drug prevention programs must be continued and contain sufficient follow-up because brief interventions lose their impact with time.

- Cultural Sensitivity:

Although personal and social training can be implemented in urban, suburban, and rural settings, prevention techniques must reflect, or take into consideration, the cultural backgrounds of the target population. Although this may be difficult to implement, research suggests that teachers should tailor curriculum activities and interactions to the cultural experiences of students as cultural relevance will allow children to be more receptive (Dusenbury and Falco, 1995; Nation et al., 2003).

- Evaluations:

Drug prevention programs must evaluate and assess their curriculum with at least a pretest, a post-test, and a control group. In addition, a drug prevention curriculum evaluation must measure how much impact the curriculum has on substance use behaviors, as well as smoking (Dusenbury and Falco, 1995; Nation et al., 2003). Such evaluations are crucial to assessing the effectiveness of the curriculum and ensuring that the desired outcomes are achieved.

What doesn't work with school-based prevention?

Decades of research and evaluations have outlined techniques that are ineffective and/or counterproductive to drug prevention efforts in the school setting. Ineffective techniques can be summarized within the five following categories:

- Lecturing and Knowledge Only:

Lecturing and providing knowledge only to children does not impact or change behavior in the long term and is one of the least effective strategies for drug prevention (Sloboda et al., 2019). Furthermore, providing specific information or knowledge on drugs can be counterproductive. Providing more information than necessary can lead students to become more "intelligent consumers of prescription drugs" (Sloboda et al., 2019). For instance, providing students with information such as "reasons for drug use, methods of use, the street names of drugs, and potential benefits of use" is not only ineffective but can also lead vulnerable kids to experiment with drugs. Finally, addressing the potential benefits of drug use such as drugs being a way to relieve pain or lose weight can incentivize kids to utilize drugs (HCA, 2019).

- Peer-Led Groups:

There is no evidence to support the notion that older students make a greater impact in preventing drug use than teachers. However, well-trained teachers have been proven to positively impact the outcome of drug prevention curricula.

- Ex-Substance Users or People in Recovery Testimonies:

Although students can be captivated by the story of an ex-substance user, children may believe that the dangers are not as great because the speaker was able to recover. Furthermore, the attention that such a speaker receives can backfire as students may glamorize drug use and substance abuse.

- Scare Tactics:

Although prominent in drug use prevention, scare tactics have been proven ineffective through multiple studies. As children grow and are exposed to peers who utilize drugs and do not sustain the consequences described in those images, the validity and credibility of such messaging are lost. Furthermore, distant consequences have little effect on youth behavior.

- One-Time Events:

As specified in the section above, drug prevention programs must be continued and contain follow-up to maintain a lasting impact. One-time educational events do not impact drug or alcohol use behavior (HCA, 2019; Griffin., & Botvin,2011; Sloboda et al., 2019).

Existing and Effective Drug Prevention Curricula

The Blueprint for Healthy Youth Development, a project of the Institute of Behavioral Science at the University of Colorado Boulder, has created a list or registry of scientifically proven and effective drug prevention programs. It evaluates and categorizes curricula based on the rigor of evidence supporting the intervention, rating them on the scale of promising, model, and model plus. To

meet the promising standard, curricula must show favorable outcomes in at least one quality randomized trial, or two high-quality quasi-experimental trials. In addition, to meet the promising criteria, curricula must also be ready for distribution with all the relevant manuals, training, and other elements needed to administer the curricula in a community. Curricula should also be able to define specific behavioral outcomes. Model curricula meet all of the above requirements and must also undergo at least two randomized controlled trials. Finally, on top of satisfying all the aforementioned requirements, "model plus" curricula have also been independently verified by a third party who was not involved in the creation of the program (Harrop and Catalano, 2016).

Below are three examples of drug prevention programs that operate at the elementary school level. Each of the following programs has been evaluated by the Blueprint for Healthy Youth Development mission:

- Raising Healthy Children:

Raising Healthy Children (RHC) is a program rated "Promising" by the Blueprint for Healthy Youth Development. It has had reported positive outcomes in enhancing academic achievement, reducing alcohol and marijuana use, as well as reducing antisocial and aggressive behavior. RHC is multifaceted and targets elementary, middle, and high school students. It is multifaceted because it includes teacher and parent training on top of student training. The teacher training program consists of but is not limited to, classroom management, strategies to enhance student motivation, student participation, and interpersonal problem-solving skills. The goal is to reduce "academic risks and early aggressive behaviors while enhancing protective factors among elementary students." Parent

training includes a program to enhance the academic achievement of the child as well as family-management skills. Finally, the student intervention is largely based on a summer camp program, providing students who have academic or behavioral problems with resources to help them succeed. The program is rated “promising” because the studies evaluating the program were limited in producing reliable data. Furthermore, slim variation in scores from the child-reported “outcome measures'' made it “difficult to identify program effect” (the University of Colorado Boulder IBS, 2023c).

- Positive Action:

Positive Action is rated “Model” by the Blueprint for Healthy Youth Development. Positive Action is school-based and goes from elementary school to middle school. The lessons are delivered two to four times a week, totaling 140 fifteen-minute sessions from kindergarten through sixth grade and 82 lessons of 15-20 minutes in grades seven and eight. The curriculum is taught through six units that teach personal health as well as competence enhancement training or broader-based skills training. Research has found positive behavioral outcomes for academic performance, alcohol, anxiety, close relationships with peers, delinquency and criminal behavior, illicit drugs, and positive social/prosocial behavior, among many other positive outcomes. However, it has not been rated “Model Plus'' because of the limitations of the studies that evaluated the effectiveness of the program (the University of Colorado Boulder IBS, 2023b).

- Life Skills Training:

Life Skills Training or LTS is described by multiple studies as an effective program in preventing drug use and abuse. It has received the “Model Plus” rating from the Blueprint for Healthy Youth Development. It was developed at Cornell University by Gilbert Botvin, a professor emeritus at Weill Cornell Medical College at Cornell University and an expert on prevention and health behavior. LTS focuses on competence enhancement and teaches students personal self-management skills, social skills, and drug resistance skills (Sloboda et al., 2019). Although their target population is middle school students, LTS is used in elementary schools in the third and fourth grades. The elementary school program is delivered in 24 sessions over three years. Multiple studies have found that LTS has impacted behavior such as alcohol, delinquency, criminal behavior, marijuana/cannabis, sexual risk behaviors, STIs, tobacco, and violence. It is ranked “Model Plus” for the long-term endurance of the effects of the program. This long-term endurance is attributed to “greater treatment dosage (15 sessions during the primary year) and (2) greater booster sessions (15 over two years), as compared to other treatments” (the University of Colorado Boulder IBS, 2023a).

Conclusion

Drug use and abuse continue to be an issue, especially with the introduction of deadly drugs such as fentanyl. This crisis has become deadlier for adolescents as drug overdose deaths among youths aged 14 to 18 have increased by 114% from 2019 to 2022. Furthermore, kids as young as 12 years old start experimenting with drugs and alcohol while not understanding the real effects of those substances on their bodies. One established measure to contain drug use and prevent further

overdose is early intervention by educating the youth on the dangers of drugs. It is with this understanding that multiple programs have developed drug prevention curricula starting at the elementary level; however, for the most part, prevention programs focus on older students in upper elementary, middle school, or high school grades.

Decades of research have provided a list of effective and ineffective techniques of prevention. It is generally agreed upon that an effective curriculum should:

a. Be research-based and theory-driven.
b. Contain developmentally appropriate information on drugs. Information includes the effects of drug use on children and adolescents instead of the long-term effects on their “adult selves." It is also recommended to avoid detailed information on drugs such as their potential “benefits” or their street names.
c. Include skill building, which is important, especially in elementary school. Drug prevention programs must focus on building life skills for children such as effective responses to peer pressure, self-control, emotional awareness, problem-solving, and resistance skills.
d. Include normative education or dispel misconceptions about the prevalence of drug use and abuse among children.
e. Make use of interactive teaching techniques.
f. Ensure adequate coverage or follow-up with students to boost the acquired knowledge and skills to avoid losing the effects of the initial lessons.
g. Incorporate cultural sensitivity, which is important as children seem to be more receptive to curricula that are relevant to their experiences.

h. Plan for and undertake an evaluation of their curriculum.

Research has also established that the following techniques do not work in prevention:

a. Lecturing and knowledge-only approaches to teaching drug prevention curricula have been described as the least effective way to teach drug prevention.
b. Peer-led groups, which means groups that are led by older students, are not proven to make a greater impact on student behavior.
c. Ex-substance users or people in recovery testimonies can be counterproductive because children can believe that the dangers are not as great, as the speaker has recovered.
d. Scare tactics.
e. One-time events are not enough to maintain a lasting impact on behavior.

Considering the outlined importance of school-based drug prevention and the necessity of beginning such prevention efforts at the elementary school level, there is a need for greater evidence-based prevention efforts in elementary schools. However, there is a limited amount of elementary school-based prevention curricula and a lack of rigorous assessment of existing curricula at the elementary school level. This lack of assessment brings into question the effectiveness of implemented programs and their impact on children's understanding and behavior toward drugs. Therefore, this evaluation of the Emily's Hope curriculum not only adds to the existing literature but also assesses its effectiveness.

Methodology

Participants

A series of eight lessons developed by Emily's Hope staff and researchers was taught to a mix of third and fourth-grade students in nine pilot schools including eight in South Dakota and one in Minnesota totaling approximately 380 students and 17 classrooms. These students completed a survey before and after completing the curriculum: 343 students from the pilot schools completed the initial survey between September 14th and November 2nd, 2022 and 321 students completed the final survey between December 12, 2022 and May 5th, 2023. The same survey was also given to third-grade students in two control districts. A total of 515 students in the control classrooms completed the initial survey between October 21st and November 16th of 2022 and 434 completed the final survey between April 18th and May 27th, 2023. The control schools include Dell Rapids third graders and Harrisburg fourth graders.

Table 2: Surveyed Schools and Number of Students

Pilot School	Number of Students in 3rd Grade	Number of Students in 4th Grade
Alcester Hudson School	30	0
Big Stone City School	9	8
Deubrook Area School District	0	29
Flandreau School District	0	55
Luverne Elementary	92	0
Todd County School District (Rosebud Elementary)	0	45
Viborg-Hurley Elementary	0	30
White River Elementary	30	21
Wilmot School	20	14
Total	181	202

To properly evaluate the curriculum, demographic factors that could impact student responses to the evaluation survey must be considered. It is worth noting that the two counties where the control schools were located are two of the most populous and urban counties in the state and contain a number of school districts. For example, the county measures for the Dell Rapids school district are of Minnehaha County. Although Dell Rapids is a smaller town, the county-level demographic information also includes the majority of Sioux Falls, the biggest city

in the state. It was not possible to find some of the information such as the drug overdose or opioid prescribing rates at a granularity less than the county level.

Table 3: District and County Demographics For Pilot and Control Schools

	Pilot Schools (min, max)	Control Schools (min, max)
Students Completing Curriculum (mean)	43.3 (20,92)	88.5 (87, 90)
District Enrollment Average	648 (85, 2044)	3447 (982, 5912)
Grade 3 Racial Enrollment Average Percentage		
American Indian	27% (0, 97.9)*	0.6% (0, 1.1)
Black or African American	1.2% (0,11)	1.1% (1.1, 1.1)
Hispanic/Latino	1.5% (0, 2.1)	3.4% (1.1, 5.5)
White	60.3% (0,100)	90.5% (85,95)
2 or More Races	5.6% (0,16)	4.5% (2.2, 6.6)
Average County Median Household Income	$55,151 (24,102: 74,006)	$73,979 (63,699: 84,260)
Average County Unemployment Rate	3.49 (2.7, 4.75)	2.65 (2.44, 2.85)
Average Children Living in Poverty Percentage	18.9% (5.6, 48.1)	7.05% (4.1, 10)
Average County Opioid Prescribing Rate per 100 People	66.8 (42, 76.4)	47.5 (38.9, 56.2)
Average Unintentional Drug Overdose Fatal per 100,000	2.75 (0, 6.6)	6.6 (4.7, 8.5)
Average Unintentional Drug Overdose Non-Fatal per 100,000	13.8 (0, 34.1)	6.6 (2.6, 10.6)
Average Drug-Related Hospital Discharges per 100,000	38.5 (0, 116.8)	32.3 (26.5, 38.2)
Average Substance use Treatment Admissions per 10,000	75.5 (24.9, 152.4)	104.6 (25.5, 183.6)

Note: Data for district and racial enrollment is from the South Dakota Department of Education 2022 enrollment. County Household Income, Unemployment Rate, Poverty Rate, and Opioid Prescribing Rate are from County Health Rankings and Roadmap 2023. Overdose Rates, Hospital Discharge Rates, and Substance Use Treatment Rates are from the South Dakota Vulnerability Assessment created by the South Dakota Department of Health, 2023.

* The average American Indian enrollment percentage is skewed high by Rosebud Elementary in Todd County, whose student enrollment is 97.9% American Indian. Without including Rosebud, the average is 18%.

All of the pilot schools are located in counties with populations of less than 100,000 and the rates of unintentional drug overdoses and drug-related discharges can appear inflated. A county of 10,000 would have on average 3.6 hospital discharges, given a discharge rate of 36 per 100,000 population; in the control school counties such as Minnehaha County, which have a much higher population, the rate may be more easily interpreted.

Curriculum Survey

The Emily's Hope curriculum is made up of eight lessons that include learning about the body, brain, medication safety, drugs' effect on the brain, healthy habits, emotions, substance use disorders, and peer pressure. The evaluation survey was developed with the help of subject matter experts and research about effective prevention program strategies. Each question in the survey given to students aimed to assess the students on a key aspect of the curriculum that was taught in at least one, sometimes multiple, lessons.

Table 4: Student survey questions including answer options and the lesson taught

	Question	Answer Options	Lesson
1	My Brain Controls My Entire Body	Yes No	1
2	Name the Three Main Parts of the Brain	Cerebrum, Cerebellum, Brain Stem Cerebrum, Cerebellum, Heart Cerebrum, Cerebellum, Eardrum	2
3	What "feel good" chemical does the brain release?	Dopamine Adrenaline Sugar All of the Above	3, 6
4	What does PTA stand for?	Pause-Think-Act Parent-Teacher-Association Play-Talk-Advocate	4, 5, 7, 8
5	Who should I take medication from?	A Trusted Adult A Friend A Stranger None of the Above	5
6	Tolerance impedes brain function and could cause me to ___	Lose Interest in Things I Like Get Better at Sports Play a Musical Instrument All of the Above	6
7	Alcohol and drugs change the way my brain works	Yes No	6
8	What would happen if I start using drugs before my brain is done growing?	High chance of developing substance use disorder Low chance of developing substance use disorder It won't affect my brain	6
9	What area of the brain controls my emotions?	Limbic System Circular System Skeletal System All of the Above	7
10	Fentanyl is____	Dangerous Safe A Pizza Topping	5

Counselors and teachers at the pilot schools were instructed to have students complete the starting survey before beginning lesson one and complete the final survey upon completion of lesson eight. Students were instructed to complete the survey on their own without the help of teachers or classmates. Control school instructors did not teach the curriculum but had students complete the starting and ending surveys in the fall and spring with the same instructions.

Students' responses were recorded anonymously. The survey was not designed to be disaggregated by school or classroom.

Counselor Interviews

For evaluation purposes, four counselors that implemented the curriculum were interviewed. These counselor interviews provided qualitative information about student reactions and also curriculum implementation that was not seen in the student surveys. The counselors were asked the following questions:

- What was your experience with using the lesson materials?
- How did your students respond to the lessons?
- Did you notice a lasting impact on students?
- How do you track students' progress?
- What was the parents' reaction to the curriculum?
- What did you like about the lessons?
- What did you not like about the curriculum?
- What would you do differently in the future?
- What were your expectations before seeing the lessons?

- How did those expectations change as you saw and began teaching the lessons?
- Why do you think it is important to teach kids this age about drug safety?
- What do you find challenging about curriculum implementation?
- What additional resources or support would you like to see provided to teachers to enhance the effectiveness of the curriculum?
- Additional Comments

The intention of the interviews was to get feedback for the Emily's Hope staff as they continue to develop the K-5 curriculum in addition to evaluating the curriculum from a counselor's perspective.

Difference-in-Difference Model

To determine the efficacy of the curriculum, researchers analyzed survey results using a difference-in-difference regression model. This type of model compares the difference in pre-and post-test scores among control group students to the difference in pre-and post-test scores among pilot group students. In essence, it tests whether students who were exposed to the Emily's Hope curriculum made bigger gains than they would have without that exposure. To conduct a difference-in-difference model on each question and overall, we will use the formula $Y= \beta0 + \beta1*[Treatment] + \beta2*[Time] + \beta3*[Time*Treatment]$ where:

- $\beta0$ is the score of the control group before treatment.
- $\beta1$ is the difference in score between the pilot and control group at the start.
- $\beta2$ is the score gains of the control group over time

- β3 is the score gains of the treatment group independent of the gains from the control group. Essentially this coefficient shows how much of the increase in score of the pilot group can be attributed to learning the curriculum compared to students simply growing older or other outside factors. This is the difference-in-difference coefficient we are most interested in to determine the impact of the curriculum on the students' answers.
- Treatment is a dummy variable where 0 indicates a control group student and 1 indicates a pilot group student.
- Time is a dummy variable indicating whether the score achieved is from before or after the curriculum.
- Y is the total correct score per student or, for tests of individual questions, a dummy variable where the value is 1 if the student answered correctly and 0 if the student answered incorrectly to each individual question.

The difference-in-difference model relies on a number of assumptions to be accurate. These assumptions include exchangeability, parallel trends, and stable unit treatment value assumptions. We assume that unobserved factors, such as demographics, presentation of the surveys and curriculum, drug usage rates, and other unmeasured factors, remain constant for both control and treatment groups which satisfy the exchangeability assumption. For the parallel trends assumption we assume that in absence of a treatment, the difference between the control and treatment groups is the same over the period of the study. (*Difference-in-Difference Estimation*, 2016). Essentially, the pilot schools had they not received the curriculum, would have improved at the same rate as the control schools throughout the school year. Finally, the stable unit treatment value assumption requires that an individual's outcome is affected only by their exposure to the

treatment and not by the exposure of those around them. Because students were not mixed within the same school or classroom between control and treatment we can be confident in that assumption as well.

Results

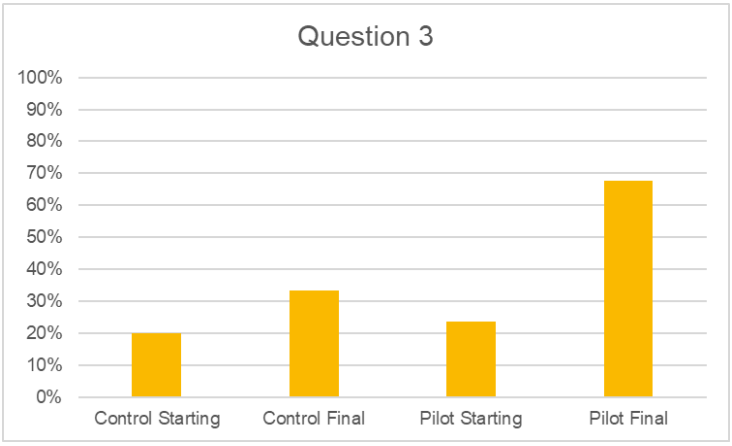
Student Survey Results

Overall, the students in pilot schools improved by 2.12 points on average before and after completion of the curriculum compared to the control students who improved by 0.78 points. The median score for the pilot schools increased by 3 points compared to the control schools where the median increased by 1 point.

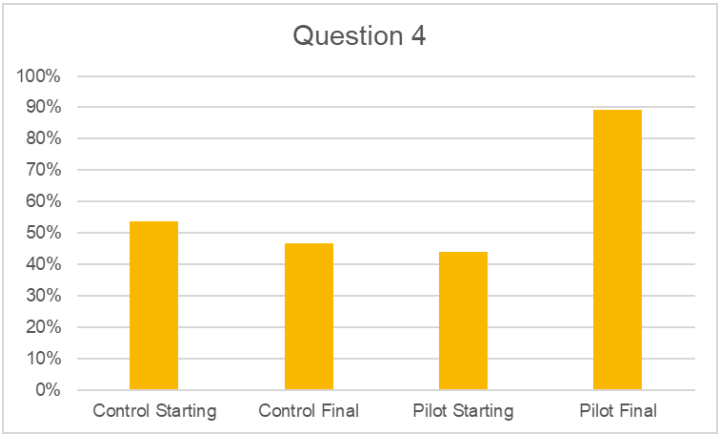
Table 5: Students Performance and Starting and Final Surveys

	Control Starting	Control Final	Pilot Starting	Pilot Ending
Total Student Responses	515	434	343	321
Average Correct	5.97	6.75	5.49	7.61
Standard Deviation	1.74	1.63	1.77	1.81
Median	6	7	5	8

The two questions that saw the greatest increases in correct responses were questions three and four: We see significant distribution changes on questions three and four for the pilot final where students improved by the highest percentage points.



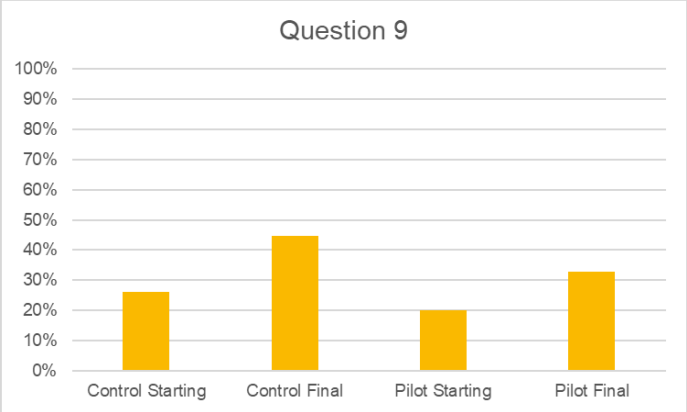
Graph 1: Percent of Students Correct on Question 3



Graph 2: Percent of Students Correct on Question 4

Most concerning is Question 9 where the same number of students in pilot classrooms answered “limbic system” as answered “circular system” and the vast majority did not answer correctly in either the starting or final survey. Though pilot

students improved by 12.6 percentage points, the percentage of students who answered correctly after the curriculum was only 32%.



Graph 3: Percent of Students Correct on Question 9

The control students scored higher on the starting survey in the fall than the pilot students on all questions except question three. The pilot students improved significantly after the curriculum and scored higher than the control students on seven of the ten questions on the final evaluation survey. The most significant improvement was seen in question four, where pilot students improved by 45.1 percentage points from the beginning survey to the final. Again, the results for question nine are concerning: this is the only question where control students showed more improvement than pilot students.

Table 6: Question Results from Pilot and Control

	Control Starting	Control Final	Pilot Starting	Pilot Final	Control Improvement	Pilot Improvement
Question 1	85.44%	87.10%	77.84%	93.46%	1.7	15.6
Question 2	49.51%	67.97%	38.78%	69.16%	18.5	30.4
Question 3	20.00%	33.41%	23.62%	67.60%	13.4	44.0
Question 4	53.79%	46.54%	44.02%	89.10%	-7.2	45.1
Question 5	82.14%	88.02%	77.26%	89.10%	5.9	11.8
Question 6	53.59%	56.22%	50.44%	74.45%	2.6	24.0
Question 7	82.72%	89.40%	78.43%	88.47%	6.7	10.0
Question 8	79.49%	79.49%	60.93%	70.72%	0	9.8
Question 9	26.02%	44.70%	20.12%	32.71%	18.7	12.6
Question 10	78.64%	82.49%	77.26%	86.29%	3.8	9.0

Note: Improvement columns are percentage point increases

Difference-in-difference Results

Though an improvement is evident in the descriptive statistics, statistical significance can solidify the usefulness of the curriculum. The results of the overall difference-in-difference test show that the effect of the curriculum is significant at the 0.05 significance level with a difference-in-difference coefficient (β3) of 1.34. This means that students who completed the curriculum improved by 1.34 points more on average than the control students. Although the control group also tended to increase, the difference-in-difference model shows statistically that the increase in the pilot school scores can be attributed to the curriculum and not due to the factors that caused an increase in the control school students.

The model also determined that the curriculum had a statistically significant effect on the results of survey questions one, two, three, four, and six. Question one saw a 0.14-point increase on average for pilot students independent of the increase in control students. Question two had a 0.12-point average increase. Question three had a 0.3-point average increase. Question four had a 0.52 average increase. Questions three and four saw the highest average increases overall and for the difference-in-difference coefficient, question six had a 0.21 point average increase.

The other questions, numbers 5, 7, 8, 9, and 10, did not have statistically significant difference-in-difference coefficients. The increases, or decreases in the case of questions eight and nine, the pilot students experienced on these questions cannot be attributed to the curriculum.

Table 7: DID Regression Results

	Question	β0	β1	β2	β3
1	My Brain Controls My Entire Body	0.85 (56.2) *	-0.07 (-3.2) *	0.02 (.73)	0.14 (3.99) *
2	Name the Three Main Parts of the Brain	0.49 (23.3) *	-0.11 (-3.2) *	0.18 (5.9) *	0.12 (2.4) *
3	What "feel good" chemical does the brain release?	0.2 (10.3) *	0.04 (1.2)	0.13 (4.7) *	0.3 (6.9) *
4	What does PTA stand for?	0.54 (26.1) *	-0.97 (-2.9)	-0.07 (-2.4) *	0.52 (11.0) *
5	Who should I take medication from?	0.82 (51.3) *	-0.05 (-1.92)	0.06 (2.48) *	0.06 (1.61)
6	Tolerance impedes brain function and could cause me to ___	0.54 (24.97) *	-0.03 (-.93)	0.026 (.83)	0.21 (4.3) *
7	Alcohol and drugs change the way my brain works	0.83 (52.5) *	-0.04 (-1.7)	0.07 (2.87) *	0.03 (.929)
8	What would happen if I start using drugs before my brain is done growing?	0.65 (32.4)*	-0.04 (-1.35)	0.14 (4.8) *	-0.04 (-.97)
9	What area of the brain controls my emotions?	0.26 (13.0) *	-0.06 (-1.8)	0.19 (6.3) *	-0.06 (-1.3)
10	Fentanyl is____	0.78 (45.5) *	-0.014 (-.51)	0.04 (1.5)	0.052 (1.3)
	Overall	5.97 (78.1) *	-0.48 (-4) *	0.78 (6.9) *	1.34 (7.62) *

*Note: The chosen significance level is 0.05 and statistically significant coefficients are denoted with a *. T values are in ().*

With the goal of the curriculum to educate students about the dangers of drug use, it is concerning that questions 7, 8, and 10, which specifically relate to drug use, did not show statistically significant results. This will be important to remedy as the curriculum expands into more grades and districts.

Interview Results

Each of the four counselors researchers interviewed spoke highly of the curriculum and their experience teaching the lessons. Counselors felt the material was age appropriate and all found three elements of the curriculum to be particularly insightful for the students. Students and counselors alike found the "Pause-Think-Act," a step-by-step method to develop healthy responses to crises, to be particularly helpful as it equipped students with a framework through which to react to crises.

Additionally, counselors and students found the emotion management provided by the curriculum to be an innovative and effective way for students to regulate their emotions by comparing them to the weather. One counselor said:

> "I think one of my favorite parts about the book, well, the whole lesson in general, and it was something I hadn't thought about before, was the idea of relating your emotions to the weather. So amazing! It's like, okay, if you're going to go out in the rain, what are you going to use? Well, you're going to use an umbrella. If you're going out in the snow, are you going to put on, you know, your parka, and your mittens and all this kind of stuff. Well, when you're having a sad day, you have to use your, whatever coping skill, you know, just like when you're going in the weather, you're protecting yourself, and you're helping yourself by doing these things. So when you're having an emotional situation, you have to have those same kinds of tools to use."

Finally, counselors found that the methods provided in the curriculum to respond to peer pressure were necessary, considering the social environment in which their schools operated. The positive feedback on these three practices was

not surprising as these practices are aligned with the evidence-based strategies found in the literature.[2]

The interviews with counselors also revealed some issues with fidelity to the curriculum in its implementation. There is a need for greater training of counselors on best practices as it pertains to teaching a drug prevention curriculum. One well-intentioned counselor not only suggested that the curriculum could be a means to instill fear into the students to prevent them from using drugs but also requested that more testimonials be included in the curriculum. Both these techniques have been proven to be ineffective and counterproductive.[3]

Additionally, the length of the lessons was inconsistent, so each counselor supplemented the curriculum with their resources to fill the designated counseling time they had with students each week. One counselor removed multiple elements of the curriculum they thought were not appropriate for their students, including multiple activities specifically related to fentanyl and drug use. The variability of the content delivered to students due to the removal of certain parts of lessons or supplemental materials not provided by Emily's Hope could have an impact on the evaluation results. For example, the students from the school who did not complete all of the fentanyl and drug lesson materials likely scored lower on survey questions seven, eight, and ten. Without the survey results disaggregated by school, it is impossible to know how these changes to the curriculum affected student results.

Overall, counselors recognized the importance of teaching drug prevention to elementary kids. Counselors were not sure what to expect before starting the curriculum and some had doubts about teaching drug prevention at a young age.

[2] View literature review's "Ten elements of effective drug prevention curriculum: what works with drug prevention."

[3] View literature review's "What doesn't work with school-based prevention."

Upon completion of the curriculum, counselors had positive experiences and spoke on the necessity of teaching drug prevention in an age-appropriate way to children. They spoke about how the curriculum gave students a safe space to talk about their experiences with family members and drugs. In one school, the counselor spoke during the interview about how there are a number of parents in the community who are in and out of jail for drug-related charges. This counselor also shared that the classrooms they worked with had two separate students whose mothers passed away from drug overdoses in the past year. For communities like this, it is extremely important to educate youth at an early age about what drugs are and how to make good choices for their bodies and brains. One counselor said:

> "We actually had a second grader last year, who thought it was candy on their parents' counter and ate it but it was actually fentanyl. The kid got very sick, but thank God, it wasn't a high enough dose to do any long-term damage. It's important for kids to be aware, like, 'What is in my home that's not safe, what is in my community that's not safe, what is on the streets, anywhere I go, that could not be safe.'"

Limitations and Further Research

The evaluation of the Emily's Hope curriculum was limited by several factors. Although this study found promising results regarding the effectiveness of the curriculum, further research is necessary to establish definitive conclusions. As the curriculum continues to be taught to more ages and in more schools, well-constructed evaluation surveys for both students and teachers as well as well-planned control schools will be necessary to establish sound conclusions.

Limitations of this pilot study include a lack of disaggregation of survey data based on school. All of the survey data was presented together with no way to break up responses based on the school or classroom a student attended. This made it impossible to control for outside factors such as demographics, adherence to curriculum, or drug use patterns in the area. While we saw differences in the aggregate between the control and pilot schools, controlling for those factors in the regression model is not useful in the aggregate because the demographic factors vary wildly between schools in both the control and pilot. While identifying results by classroom or school would minimize some of the issues with outside factors, it would be ideal for research purposes to track the results of individual students from the pre- to post-survey.

In addition, researchers could not contact all of the teachers and counselors who taught the curriculum, so conclusions drawn from the counselor interviews only account for less than half of those who taught the curriculum. The evaluation was not initially designed to measure or account for adherence to the curriculum. During interviews, some counselors explained how they supplemented or removed pieces of the curriculum, but with limited interviews and not being aware of nonadherence before creating interview questions, this was an overlooked area that should be addressed in future research.

Conclusion

As drug use continues to be a problem in society, especially for young people, it is important for school-based drug prevention curricula, such as the one developed by Emily's Hope, to continue teaching students about the effect drugs can have. The Emily's Hope lessons were designed with research and evidence, and

this study found promising results from the Emily's Hope curriculum. This includes statistically significant results on student performance after going through the curriculum and anecdotal approval from counselors who piloted the program. Further research is needed as the curriculum expands to more schools and grade levels.

Part 2: Adolescent (6-12 grade) Drug Prevention Curriculum: Literature Review

Introduction

Adolescent mental health has remained a pressing concern, with drug use playing an important role in the crisis. Drug use among 8th graders increased by 61% between 2016 and 2020. In 2020, overdose deaths doubled, and in the first half of 2021, deaths increased by 20 percent (Rivero, 2022). Research finds that roughly 3,300 12-year-olds try marijuana every day (SAMHSA, 2022c). This is worrisome because 70% of youth who try illegal drugs before the age of 13 “develop a substance abuse disorder within the next seven years” (NCDAS,2023). Furthermore, in 2022, 437,000 adolescents aged 12-17 were initiated to cigarettes, 1.8 million to alcohol, 1.2 million to marijuana, 29,000 were initiated to cocaine, and 220,000 to hallucinogens (SAMSHA, 2023).

The reasons for adolescent drug use are complex but can be categorized in three ways: neurological, emotional, and social.

Reasons for Adolescent Drug Use

1. *Neurological*

Healthy brain development is crucial during adolescence to ensure cognitive and social capacities in adulthood (Gray & Squeglia, 2017). Drug and alcohol use between the ages of 13 and 17 leads to poor " verbal learning and memory, (...)and attention by age 25" (Gray & Squeglia, 2017).

The adolescent brain, still undergoing critical development, is not quite equipped to protect adolescents from the risks of drug use. During adolescence, the brain contains low dopamine levels, causing an imbalance that leads to greater risk behaviors. Furthermore, the development of the reward-seeking system before the development of the cognitive control system in the adolescent brain renders them susceptible to drug initiation and use (Somerville et al., 2010; van Duijvenvoorde et al., 2016). This risk-seeking behavior caused by the imbalance in the brain has been found to lead to greater alcohol use (Epstein, J. A., & Botvin, G. J., 2002).

2. *Emotional*

In addition to neurological factors, adolescents have reported using drugs to cope with negative emotions. A study surveying 109 adolescents found that over 53.2% of adolescents reported using drugs as a "negative reinforcement," or to cope with negative emotions (Dow & Kelly, 2013). In 2022, the National Survey on Drug Use and Health reported that adolescents experiencing a major depressive episode were more likely than their peers to use illicit drugs (SAMHSA,2023). Drug use for negative reinforcement has been found to lead to heavier drug use,

underlying the necessity of teaching students healthy coping skills to deal with negative emotions (Cooper, Frone, Russell, & Mudar, 1995; Patrick et al., 2011).

3. Social

Finally, societal context plays an important role in shaping adolescents' perception of drugs and their subsequent drug use. These factors are organized into four: Parents' socialization context, school, peer, and neighborhood socialization contexts (Gray & Squeglia, 2017).

1. Peer socialization context

Although the effects of peer influence are well documented (Branstetter et al., 2011; Mathys et al., 2013; Rowan, 2016), questions remain as to whether peer pressure and substance use (peer socialization) or whether a teenager's substance use leads them to select peers that do the same (peer selection). The literature seems to suggest that both peer socialization and peer selection play a role in adolescent drug use. Furthermore, research finds that adolescents tend to project their substance use behaviors onto their peers, assuming that if they use drugs, their peers probably do too. Additionally, youth tend to overestimate how much their peers consume substances, and underestimate peers' "engagement in adaptive behaviors." For instance, Helms et al. (2014) found that although "high-status" adolescents reported virtually no substance use, peers tended to estimate their use of cigarettes as "up to times a day and smoking marijuana up to nine times a month" (Trucco, 2020). These false beliefs, in turn, impact substance use.

2. **School socialization context**

Students' relationship with their school impacts adolescent substance use in two ways: school organization and class climate. Although school organization has somewhat of a distant impact on adolescent drug use, the perceived tolerance of a school towards drug use impacts the adolescent's substance use.

Class climate, however, has a more direct impact on adolescents' drug use. Research suggests that "'a positive teacher-student relationship and quality, and a more accepting school climate protected against early onset of alcohol use" (Gray & Squeglia, 2017). On the other hand, school disconnectedness and disengagement, such as absences without a valid reason, are found to increase the likelihood of drug use. Repeated absences increase the likelihood that adolescents will find themselves in environments that encourage drug use.

Another study found that drug use (not alcohol use) was positively associated with school disengagement in middle adolescence, whereas in late adolescence, drug and alcohol abuse were both positively associated with school disengagement (Henry et al., 2012).

3. **Parents socialization context**

Parents' socialization context has one of the strongest impacts on adolescent drug use. Parents play a crucial role in shaping adolescent behavior, including substance use. Their influence tends to be the strongest among all factors. Parents' influence can either be direct or indirect.

Through communication, rules, and monitoring, parents can directly impact substance use behavior (Barnes et al.,, 2006; Ladis et al., 2020). On the other hand, **a**dolescents' perception of parental approval or disapproval of substance use also

affects their choices. The literature indicates that the likelihood of children's substance use increases with their exposure to parents' substance use (Gilman et al., 2009; Smit et al., 2018). It is important, however, to underline that parental influence operates within the broader context of family dynamics and relationships such as low-parents child attachment (Trucco, 2020).

4. Neighborhood socialization context

The impact of the neighborhood socialization context is divided into two factors: neighborhood structure and neighborhood processes. Neighborhood structure encompasses median income, poverty rates, and employment rates. Research suggests that unemployment and "neighborhood disadvantage" (Trucco, 2020) are associated with the use of drugs such as marijuana and enhance the risk of adolescent initiation to marijuana. This can be due to a greater likelihood of being exposed to and obtaining substances. However, it is worth mentioning that certain studies found that the more disadvantageous a neighborhood is, the more monitoring the parents are likely to do.

On the other hand, neighborhood processes refer to the social cohesion of a neighborhood and the willingness to handle issues as a community. The research found that the higher the sense of community, the lower the likelihood of alcohol, cigarette, and, marijuana use in school.

Model Drug Prevention Curriculums for Adolescents

These findings suggest that drug use among adolescents is prominent not only because of the neurological susceptibilities that render them vulnerable to

drug initiation but also because adolescents use drugs to cope with negative emotions. Furthermore, the social contexts in which they find themselves may impact their perceptions of drug use. These social contexts can be the neighborhood in which they live, their parents, the school they attend, and the peers they associate with. However, parents' social context and peer social context have the most impact on adolescent drug use (Gray & Squeglia, 2017). Consequently, drug prevention curriculums must aim at developing adolescent skills in emotional regulation, reinforcing personal anti-drug attitudes to resist drug initiation despite their social context, and providing the skills to communicate their objection to drug and substance use effectively.

Contrary to elementary-level prevention, whose primary focus should be: "self-control; emotional awareness; communication; social problem-solving; and academic support, especially in reading" (NIDA,2003), drug prevention curriculums for adolescents must aim at improving the following skills:

> "study habits and academic support; communication; peer relationships; self-efficacy and assertiveness; drug resistance skills; reinforcement of anti-drug attitudes; and strengthening of personal commitments against drug abuse" (NIDA,2003).

Below are two curricula, Life Skills Training and Project Towards No Drug Abuse, that have been found to have a positive impact on adolescent drug use:

Life Skills Training, a drug prevention curriculum rated "model plus" by Blueprints for Healthy Youth Development (Blueprints Programs, n.d.), has designed a drug-prevention program to foster the recommended skills above. The program is sectioned into four: 6-7, 7-8, 9-10, and 11-12 grades.

The sixth to seventh-grade curriculum focuses on emotional regulation, self-image, and challenging myths about substance use, specifically marijuana and alcohol. Furthermore, this section of the curriculum teaches communication and conflict-resolution skills. The seventh to eighth-grade section addresses all the skills above, in addition to addressing the causes and effects of drugs and violence, media influence awareness, decision-making, and peer pressure resistance.

The eighth and ninth-grade sections of the curriculum address the previous skills. Still, instead of the session on violence and drugs, the curriculum includes the causes and effects of drug abuse. The ninth to 10th-grade section of the curriculum emphasizes health and healthy habits. This portion of the curriculum teaches the value of health, provides decision making-skills, promotes healthier family communication, and addresses the relationship between risk-taking and health.

The final section of the curriculum, grades 11th through 12th, provides the students with goal-setting, relationship-building, communication, money, and time management. Additionally, it addresses the relationship between decision-making and risk-taking.

Although the skills learned in the curriculum are similar from 6th to 12th grades, the approach differs in each grade and is adjusted to the audience. Further details are provided in the linked Life Skills Training catalog: napa-catalog.pdf (lifeskillstraining.com)

Life Skills Training's approach to adolescent drug prevention is effective. According to evidence by "Programs that Work," the Life Skills Training middle school program has led to a 10-30% reduction in drunkenness, smoking, and marijuana use by 12 grade (Social Program that Work, 2019). Another longitudinal study evaluation of Life Skills Training found that 13 years later, 2040 students who

participated in the program in junior high had a lower rate of “overall lifetime illicit drug use, as well as lifetime marijuana use, marijuana intoxication, and lifetime non-medical pill use” (Williams, C., Griffin, K.W., Mehta, R.K. *et al.,*2021). Another study assessing the effectiveness of Lifeskills Training found that teenagers at high initiation risk responded positively to the curriculum as they later on engaged in less smoking (Griffin & Botvin, 2010).

Project Towards No Drug Abuse (TND) is a curriculum that approaches its drug prevention efforts similarly to LST, to foster the skills listed above. TND is focused primarily on high-risk high school students to promote social, self-control, and coping skills. Additionally, TND enhances students’ decision-making skills and encourages them to make healthy choices and develop healthy habits. This curriculum includes activities such as role-playing exercises, games, and videos (Blueprints for Healthy Youth Development.,nd). Assessments demonstrate that TND students were less likely to use hard drugs compared to peers in control schools (Griffin & Botvin, 2010).

Finally, the National Institute on Drug Abuse (NIDA) takes a similar approach in its drug prevention materials for teachers. The NIDA drug prevention educational resources include tips for emotional well-being, skills to cope with stress, challenge the myths about drug use, and provide information on the effects of drugs on the body and brain. It also provides a certain number of activities to ensure learning. For instance, one prompt encourages students to reflect on their stress levels and offers emotional regulation tips (NIDA, 2023).

The curricula above support the research suggesting that drug prevention at the high school level should foster skills that reinforce personal non-drug attitudes, emotional regulation, and social skills such as communication.

Part 3: Teacher Training and Implementation Fidelity

Introduction

School-based drug prevention curriculums have widely been found to be an effective means of impacting youth behavior and decision-making (Botvin, Griffin, Scheier, and Williams, 2023). However, these programs' effectiveness often relies on how they are implemented. One important element of a successful program is implementation fidelity, the extent to which a curriculum was taught as intended by program developers. Despite the importance of fidelity, changes in implementation are common: Miller-Day et al. (2013) investigated the implementation of the Keeping it Real drug prevention curriculum in 25 schools at the 7th-grade level around the United States, and found that “more than 97 percent of the observed lessons were altered in some way.” This degree of adaptation to the curriculum can be detrimental because poor implementation fidelity is one of the leading causes of reduced program effectiveness (Tobler & Stratton, 1997; Durlak & DuPre, 2008).

Although adaptation can be detrimental, recent scholarship finds that some degree of adaption is inevitable and in some limited cases, beneficial (Hetch & Miller-day 2010). Research demonstrates that prevention programs often cannot account for all the cultural landscapes in which they are disseminated. Furthermore, Botvin (2004) found that adapting the curriculum to the target audience can increase engagement and enhance the curriculum.

Further research by Dusenbury et al., 2003 demonstrates that it is often excellent teachers who apply adaptations to the curriculum. Therefore, it is important to understand the reasons why teachers report altering the curriculum and the real-world circumstances under which curriculums are disseminated to better inform teacher training.

Types of Adaptations and Reasons behind Adaptation

Constraints

A study by Miller-Day et al. (2013) evaluating the implementation of the Keeping it Real curriculum found that the most important reason for teachers' altering elements of the curriculum was constraints. These included time, structural, personal, and technical constraints.

Of all of the above constraints, time was the most important with 35% of teachers (107) reporting that either not having enough time or preferring to spend more time in one element of the curriculum rather than another influenced their omission of parts of the curriculum (Miller-Day et al., 2013). For instance, one teacher reported that they had a great discussion session and eventually ran out of time. Another teacher reported that because she knew she would run out of time, she had decided to omit certain parts of the curriculum that she deemed least important.

Structural constraints, on the other hand, apply when a curriculum is implemented within the rules and schedules of an institution. For instance, one teacher reported that there was a fire drill that led to portions of the lesson being

omitted. Another important structural factor is the support of key personnel for the curriculum such as the principal or other staff members whose support is important to implementation fidelity (Little et al., 2013).

Additionally, personal constraints played an important role in program fidelity. For instance, if a teacher did not agree with certain elements of the curriculum, or did not feel comfortable teaching elements of the curriculum, it could lead them to alter a portion of the curriculum with one that they believed was more appropriate. A study into the implementation of Towards No Tobacco Use found that teacher enthusiasm and support for the curriculum are positively correlated with higher implementation fidelity. However, it also found, as mentioned above, that teacher fidelity was associated with the school's and key personnel's support of the program (Little et al., 2013).

Response to student engagement with the material

Another factor in the omission or adaptation of the curriculum was teachers' response to their students. Teachers often adapted the discussions to the attention span, maturity, and age appropriateness of their students. For instance, one teacher reported canceling the video portion of the Keepin' it Real curriculum because the students were being loud and therefore, did not "earn" the video which was their favorite portion (Miller-Day et al., 2013).

In other cases, the curriculum was adapted to promote further engagement and participation of the students. To this aim, the layout of certain activities was altered and adapted. For instance, one teacher adapted the role plays to meet the understanding of students in rural areas. Cultural elements are important reasons for curriculum adaptation as oftentimes, it is difficult to captivate students in a

role-play or set of activities that they do not see or experience themselves (Hecht & Raup Krieger, 2006).

Implications and Recommendations for Teacher Training

Research finds that teacher training is one of the most effective means to increase implementation fidelity (Dusenbury et al., 2003). As training provides teachers with the knowledge and background of the program, it fosters a sense of ownership and commitment which promotes program fidelity (Fors & Doster, 1985; Perry, Murray, & Griffin,1990).

The literature recommendations for teachers' training can be classified under three points: 1. Define key elements of the curriculum, 2. Technical Assistance, 3. Frequency.

1. Define the key elements of the curriculum

Research finds that adaptation to fit the local context and real-world circumstances can either strengthen or reduce the effectiveness of a curriculum if it is “fidelity-consistent or inconsistent” (Stirman et al., 2013). Allan et al. define fidelity as the “effective implementation of core intervention elements” (Allen et al., 2018, p. 267). It is important, therefore, when training teachers, to define core or key elements of a curriculum to communicate what cannot be altered or adapted.

A study by Botvin et al. (2018) provides practical means to do so. The authors evaluate a training method to foster fidelity while maintaining flexibility for adaptation to local realities. Called Fidelity Enhancement (FE) training, the training included elements to define key components of the Life Skills Training curriculum

and highlight the importance of implementation fidelity. In this study, a sample of 47 teachers from 34 middle schools across the United States was divided into a control group of 22 teachers and an FE group of 25.

The training materials for FE teachers were a Planning workbook, a fidelity checklist, a training DVD, and “just-in-time emails.”

a. Planning Workbook

The planning workbook is a means to work with teachers to facilitate adaptation to local realities while maintaining fidelity. The role of the workbook was to “help them choose an implementation strategy that meets the local needs of their school while maintaining fidelity to the program” (Botvin et al., 2018). The workbook also provided “instructions on how to evaluate each step of the implementation strategy” (Botvin et al., 2018).

It is a means to plan for local community realities without compromising the effectiveness of the curriculum. The workbook is made out of 46 pages divided into six sections. Sections include but are not limited to: An overview of the program which communicates the value of LTS and provides evidence-based recommendations on teaching methods, booster sessions, and the role of information. The following section of the workbook contains what is called the “7 Cs of implementation,” which are steps that institutions can follow to ensure implementation fidelity within the local context. These steps include but are not limited to establishing a planning committee, an assessment of local needs, and means for teacher evaluation. Each step in this section outlines the tools institutions can use to complete said step (i.e.: local youth behavior survey reports, markers, and a sample agenda item). The training also includes worksheets to

assist institutions through the planning process. At the end of the workbook, several resources highlight the behavioral changes LST aims to achieve, a resource on the importance of implementation fidelity, and tips on maintaining that fidelity (National Health Promotion Associates,2017). Here is a link for further details: https://www.lifeskillstraining.com/wp-content/uploads/2017/10/LST-Planning-Workbook.pdf

b. Fidelity checklist

To enhance fidelity and the effectiveness of the curriculum, teachers were provided with a fidelity checklist. The checklist helped the teachers evaluate themselves but also served as a reminder of key curriculum goals, content, and activities for each lesson.

c. Just-in-time-emails

Just-in-time emails were a means through which teachers were reminded, before each session, of the importance of program fidelity. These emails would contain information about the key elements of the curriculum, provide tips about interactive teaching methods, and remind teachers to allocate enough time to important activities such as skill practice.

d. Provider Training DVD

Finally, teachers were provided with a DVD containing several resources including an overview of the initial training workshop and key findings of drug prevention curriculum literature. For instance, the DVD described “factors that led to high-risk behavior in youth, essential teaching technique, and skills for successful

implementation." Additionally, the DVD highlighted areas of flexibility where adaptation was acceptable.

2. *Provide Technical Assistance*

Another important element of training is technical assistance. In this study, technical assistance was provided in two ways. The first was "pre-implementation technical assistance," provided over the phone, and helped teachers navigate implementation questions and issues before or during implementation.

The second means through which technical assistance was provided was through a technical assistance website which contained resources to facilitate and foster fidelity. The website outlined the goals of each level of the LifeSkills Training curriculums and outlined skills taught in each lesson (Botvin et al., 2018). Additionally, the website had a "frequently asked questions" portion and provided additional information on how to access telephone assistance.

In this study, program fidelity was calculated based on adherence, dosage,[4] and implementation quality, meaning the means through which the program was implemented (i.e., interactive methods). The study found that teachers in the FE training program increased the key elements of the curriculum taught from 66.5% to 73.9%. Time spent per lesson increased from 29.2 minutes to 36.1 minutes.

Furthermore, the study indicated that FE teachers implemented a greater percentage of the "facilitated discussions of program content," 71.2% compared to 61.8% of teachers in the control group. Additionally, FE teachers implemented a greater portion of the skill-learning content, 67.7% compared to teachers in the control group, at 51.6%.

[4] Dosage signifies whether the time teachers spent on the curriculum met the time intended by program developers.

Finally, teachers in the FE condition spent more time than teachers in the control group doing key curriculum elements such as facilitated discussion, skills demonstration, explanation, and practice (Botvin et al., 2018).

3. *Frequency of training*

In addition to defining key elements of the curriculum and technical assistance, training must have a degree of frequency. Research suggests that providing only one teacher training session is insufficient to maintain fidelity. A study into training frequency for the implementation of the Towards No Drug Project curriculum found that having follow-up training sessions instead of one workshop session was correlated with higher implementation fidelity (Rohrbach et al., 2010).

Additionally, Ringwalt et al. (2010) found in an evaluation of teacher fidelity to the drug prevention curriculum ”All Stars,” that by the third year of teaching a curriculum, teachers tended to draw closer to a mean level of fidelity. In this study, there are two groups of teachers. In the first group are teachers who started the curriculum with high levels of fidelity but with time, regressed towards the mean and adapted the curriculum more. The second group of teachers had low levels of fidelity below the mean but with time, increased their fidelity.

The study suggests, therefore, that some type of training “reinforcement” should be frequently provided to teachers. Training reinforcements will allow teachers in the first group to maintain high levels of fidelity and support those in the second group to understand the importance of fidelity and increase their fidelity levels. However, frequent in-person training can become expensive, and some teachers reported them as being “repetitive” (Mihalic, Fagan, & Argamaso

(2008). Consequently, just-in-time emails or messages can serve as a substitute for frequent in-person training reinforcement (Ringwalt et al., 2010).

In-person Training

Although all the training components of the Fidelity Enhancement Training were online, In-person training is found to have positive effects, as well. Lazaro et al. (2021) evaluated a teacher training whose goal was to "equip educators to implement the Tobacco Prevention Toolkit." The training was designed in a three to four-hour training session that comprised three elements: An information session, a website navigation session, and a hands-on demonstration.

1. Information Session

The Information Session component included an "E-Cigarette 101 Overview presentation" whose purpose was to demonstrate the use of the Toolkit materials and provide information on emerging tobacco products including e-cigarettes relevant to middle and high school tobacco education.

2. Website Navigation

The goal of this portion of the training was to indicate where each element of the curriculum could be found on the website. This portion also included a scavenger hunt to allow teachers to find their way through the website on their own devices.

3. Hands-on Participant Curriculum Demonstration.

This portion of the training aimed at allowing teachers to practice with the curriculum while receiving feedback from trainers on their teaching techniques. When a school or organization couldn't dedicate three to four hours of training sessions, an abbreviated training session was provided. The abbreviated training sessions only lasted two to two hours and a half. At the end of the sessions, participants were asked to fill out a survey assessing their experience of the training.

In total, 486 people attended the 21 training sessions which took place across six states. Out of the 486 people, 349 participants completed the survey. Out of the 349 participants, the study reported that:

> "99% of participants agreed or strongly agreed that their knowledge increased as a result of the training, 99% indicated that the presenters were knowledgeable about the subject, 100% said that the training met their expectations, 94.4% agreed or strongly agreed that the training length was just right, 20.3% agreed or strongly agreed that the training length was too short, and 9.8% said it was too long (note: each question was asked separately and therefore responses were not mutually exclusive); and 99% agreed or strongly agreed that they were satisfied with the training and they intended to use the curriculum in the future."(Lazaro et al., 2021)

The abbreviated training sessions had similar feedback on every point except for the length of the training. Lazaro et al. report that only 86.9% of participants reported that the training length was just right compared to 95.4% in the standard training sessions. 2.4% of the participants thought it was too long compared to

10.8% of the participants in the standard training, and 43% compared to 17.4% of participants found the training to be too short (Lazaro et al., 2021).

Findings: Emily's Hope Teacher Feedback

" *In my sixth-grade classroom, this year, I have two separate girls who lost their moms within four days of each other last year due to drug overdose. So to have something like this, even as a resource now that I can go back to and show them her videos, her story. (...) It is something that I can pull for those kids and say:'Hey, out of this adversity, you don't have to struggle alone, there's help, and there are resources. There are ways around it early*."'

" *We actually had a second grader last year, who thought it was candy on their parents' counter and ate it but it was actually fentanyl. The kid got very sick, but thank God, it wasn't a high dose enough to do any long-term damage. It's for kids to be aware, like, "What is in my home, that's not safe, what is in my community that's not safe, what is on the streets, anywhere I go, that could not be safe."*

Every teacher we interviewed for this evaluation loved the material and thought it was age-appropriate and necessary. They all stated that the content of the curriculum was well-paced and very insightful for themselves and the kids. They particularly enjoyed the Pause-Think-Act and "relating emotions to weather" elements of the curriculum. Teachers said that the curriculum provided the students with a space to share their experiences. They also loved meeting with Angela.

Teachers we interviewed also provided suggestions on means to improve the curriculum:

- They explained that the exit tickets were monotonous. They suggested that Emily's Hope either provide examples of things students could write, or replace the tickets with activities to get students to move around.
- They suggested that additional definitions be provided for some terminology or provide means to explain those terminologies to kids that age.(ex. Substance use disorder, brain chemicals, etc.).
- They suggested that the current brain model be replaced with a bigger, better-labeled one as kids had to come up one by one to be able to see the brain. Furthermore, they suggested that the brains be labeled with the Brain Stem, Cerebrum, and Cerebellum to stay consistent with the lesson content.
- Teachers stated that they could not figure out how to put the brains together. They suggested that there be a step-by-step explanation.
- One teacher requested that the video transition between the reading and the song, be smoother and quieter. Kids, particularly special needs kids, were startled by the transition.
- They suggested that they would like rough estimates on the length of each lesson in the curriculum so they can plan the lessons to fit the entire counseling time.
- One teacher and her administration didn't like the letter to parents that Emily's Hope provided and chose to draft and send another letter. They believe the letter was too long.
- The same teacher did not like the exercise with the quarter and the salt and chose to not include it in her class.

- Another teacher mentioned that she would like to see more testimonials from people who have experienced drug use and abuse.

Discussion

Although the study above does not assess whether the curriculum was implemented with fidelity, the survey demonstrates an important factor of implementation fidelity: teacher enthusiasm and knowledge of the curriculum. This signifies that training workshops are indeed ways to increase key personnel's enthusiasm and commitment to the curriculum (Mihalic, Fagan, & Argamaso, 2008).

However, the literature is not clear on whether in-person training or online training is more effective or whether the above level of enthusiasm could be reached through online training only. However, Mihalic, Fagan, & Argamaso (2008), evaluated in-person teacher training for the implementation of the LifeSkills Training curriculum and found that fidelity improved, but “absenteeism often occurred” during in-person training sessions. Other times, there were teacher turnovers which either delayed the implementation of the program until another teacher could be trained or, when unidentified, led to untrained teachers implementing the curriculum, or the curriculum not being taught at all. There are, however, benefits to in-person training such as the ability for teachers to practice elements of the curriculum, receive immediate feedback, and interact with and learn from other teachers (Lazaro et al., 2021).

On the other hand, providing a wide array of remote or online resources reduces the likelihood of untrained teachers administering the curriculum after turnovers and online training can be more cost-effective.

Although the Fidelity Enhancement training research did not mention which online method was most effective, the study reported that, “It appears that providing multiple options for accessing this information may be the most effective approach(...) Some teachers may be more likely to use some fidelity enhancements than others, and providing multiple options may increase the likelihood that they will use some of the additional resources” (Botvin et al., 2018, pg 608).

Recommendations

Based on these findings, Emily’s Hope should design a training program that communicates the research on the best practices in drug prevention curriculums. For instance, testimonials are found to be counterproductive in drug prevention. Equipping teachers with evidence-based knowledge may assist them in making informed decisions. Furthermore, training must highlight the importance of program fidelity, and communicate areas of flexibility for adaptation. To prevent instances when a teacher omits a portion of the curriculum, it is important to communicate the value of these activities and discuss the impact of fidelity on program effectiveness. However, it is necessary to communicate areas of flexibility for cultural adaptation, for instance. Additionally, Emily’s Hope teacher training must include training materials on steps to perform activities accompanying the curriculum. Teachers reported that there were activities that they could not quite figure out, such as the brain game, which led them to omit that part of the curriculum entirely. It would be beneficial to have this information available online to ensure that teachers have access to crucial information and materials as they progress through the curriculum. Finally, Emily’s Hope could add role-playing to allow students to move around and diversify its activities. Furthermore, role-playing

is an evidence-based means to amplify learning in the context of drug prevention because it allows students to practice the skills they have learned (Northern Illinois University Center for Innovative Teaching and Learning, 2012).

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