School-based Overdose Prevention Pilot Program – Providing Education on Illicitly Manufactured Fentanyl, Overdose Recognition, Response, and Naloxone Access

[redacted]

Affiliations: Fentanyl Fathers Inc.

[redacted]

Funding Sources

Fentanyl Fathers Inc. received an in-kind donation of 1,500 nasal naloxone doses from Velocity Biogroup, a third-party representative of Hikma Pharmaceuticals Inc., to use during this pilot study period. Neither Velocity Biogroup, nor Hikma Pharmaceuticals Inc. had any involvement in this study's design, implementation, analysis, manuscript preparation or submission.

Acknowledgements

The author wishes to thank Bryce Pardo, PhD, and Christina Heminger, DrPH MS for reviewing and providing edits to an early draft of this manuscript. The author also wishes to thank the study sites and students attending this program.

Author Contributions

JPS: Program design, implementation, speaker training, data collection, analysis, manuscript preparation and submission.

ABSTRACT

Background:

Opioid-related deaths, fueled by illicit fentanyl, are a growing public health concern in the United States. Adolescent fatalities have surged with the emergence of counterfeit pills and illicitly manufactured fentanyl's ubiquity in American communities. This 3-month pilot program aimed to increase awareness about fentanyl and counterfeit pills for adolescents and increase naloxone access in schools to prevent youth overdose deaths.

Methods:

Students across Alaska, Ohio, and Michigan (11-18 years) attended a Fentanyl Fathers Live High School Assembly presentation. Pre and posttest surveys, employing constructs from the Health Belief Model, were administered using QR codes. Seven assemblies were presented to 6,000 students. Survey data was used to evaluate attitude changes, calculate positive predictive scores, and record baseline drug misuse.

*Results***:**

Independent samples t-test of pre and posttest responses (n1=1,275, n2=854) revealed statistically significant attitude changes across six, 10-point Likert scaled items: perceived severity of fentanyl use (0.6, $p<0.001$), perceived susceptibility to an overdose (0.9, $p<0.001$), perceived benefit of drug abstinence (0.8, $p<0.001$), perceived barriers to naloxone (-2.2, $p<0.001$), self-efficacy to recognize an overdose (1.1, $p<0.001$), and respond to an overdose (1.5, $p<0.001$). Initial drug and alcohol misuse stood at 14.5%. Predictive scores positively correlated with five of the six constructs measured. Linear regression analysis showed that female gender, perceived benefit, and perceived severity scores were associated with greater intentions to reduce drug misuse behaviors.

Conclusions:

Applying the Health Belief Model and bereaved-parent testimony, this school-based overdose prevention program demonstrated notable attitude changes among adolescents. Theory-guided public health interventions forecast engagement with preventive behaviors that are more likely to yield significant behavioral shifts in addressing drug misuse, and fentanyl-related overdoses for school-aged populations.

INTRODUCTION

According to the Centers for Disease Control and Prevention (CDC), approximately 150 people die every day from overdoses related to synthetic opioids like illegally manufactured fentanyl.[1] A record of 109,107 Americans died from drug overdoses in 2022, and over two thirds of these deaths were related to fentanyl.[2]

Opioid overdose death trends have risen more rapidly in adolescents than in the general population in recent years. A new study by the CDC found that deaths from opioid overdoses in adolescents between 14 and 18 increased by 94% between 2019 and 2020, and by an additional 20% between 2020 and 2021, and fentanyl was found to be the leading culprit accounting for 77% of adolescent overdose deaths in 2021.[3]

In 2019, prescription opioid misuse prevalence among U.S. high school students was estimated to be 7.2%, and prescription opioid misuse increases the probability of experiencing a fatal overdose.[4] The United States Drug Enforcement Administration (DEA) found that 6 out of 10 fake prescription pills that were seized in 2022 contained more than 2 milligrams of fentanyl, which is considered a potentially lethal amount.[5] These counterfeit pills are being sold and advertised as diverted pharmaceuticals like oxycodone, Percocet, Xanax, and Adderall. The CDC estimated that about one in four adolescent overdose deaths had evidence of counterfeit pill involvement in 2021, and most of those were witnessed by a bystander with no overdose response given prior to emergency medical service arrival.[6]

Our aim was to implement a school-based pilot program led by bereaved parent testimony to see whether fentanyl awareness, opioid overdose recognition, and overdose response education is successful in driving statistically significant attitudes changes informed by the constructs of the Health Belief Model (HBM).[7] If changes were observed, then the program can expect decreases in drug misuse behavior, overdose incidence and fatality in the target population.

Health Belief Model

The HBM was developed in the 1950s by social psychologists at the U.S. Public Health Service to better understand the failings of screening programs for tuberculosis.[7] The HBM suggests that people's beliefs about health problems, perceived benefits of action, barriers to action, and self-efficacy explain engagement (or lack of engagement) in health-promoting behaviors. A stimulus, or cue to action, must also be present to trigger the health-promoting behavior.[8] The HBM has been used to inform many public health interventions, including for modifying overdose risk factors, and responding to witnessed overdoses.[9]

METHODS

The Fentanyl Fathers Live High School Assembly pilot program was implemented with adolescents between the ages of 11 and 18 across seven high schools in the United States: Anchorage, Alaska (3); Birmingham, Michigan (1); Sandusky, Ohio (1); Willard, Ohio (1); Castalia, Ohio (1). School districts were selected based on recent news reports of adolescent overdoses, or deaths related to fentanyl. School administrators and nonprofit community leaders participated in the planning and facilitation of the fentanyl awareness assemblies. A logic model

was developed to organize the program's inputs, activities, expected outputs and SMART objectives.

A curriculum was then developed using governmental sources to present current fentanyl and counterfeit pill trend data, signs of an opioid overdose, case studies, Good Samaritan laws, and on-stage naloxone training for opioid overdose response measures. Pre and post-test surveys were developed using Google Forms to test whether the program's expected outcomes were being met during the program implementation period between March and May 2023. After the implementation period, data was organized into a Microsoft Excel spreadsheet and transferred into IBM SPSS version 29.0 for data analysis. A codebook was created for numeric coding of survey responses, and coded data was used to perform final analysis. Study results were formalized into a report and disseminated to program stakeholders.

Speaker Recruitment and School Selection

Program staff conducted outreach to parents who had been impacted by fentanyl poisoning or overdose death. The pilot program wanted to include bereaved parent testimony during presentations so students would relate strongly with the education. Recruitment of parent speakers was initiated through three methods: word of mouth recommendations from community members; internet searches on adolescent fentanyl-related deaths and social media follow up; and direct email or phone call from another bereaved parent.

Potential speakers were invited to join a weekly online support group with other bereaved parents. Support groups were held using Google Meets to encourage speaker attendance from different geographic regions. Online meetings followed a loose agenda focused on fostering discussion, sharing testimony, and forming relationships with program staff and other speakers. Potential speakers were encouraged to reach out to their deceased son or daughter's high school to schedule a Fentanyl Fathers Live High School Assembly. Four parent-speakers participated in the program's implementation, and each met with program staff individually to discuss how to share personal testimony in an impactful way during an assembly presentation.

School assembly locations were selected by a recent report of fentanyl-related adolescent overdose, or fatality. This information was collected using news reports from various sources, and from parent speakers who participated in sharing their testimony for an assembly event. Outreach to schools was performed by both program staff and parent speakers. Initial communications were sent to either school principals, health teachers, or teaching staff. Proposed presentation materials were then provided to the school for assembly approval, and a discussion about providing naloxone doses to the school was initiated.

School administrators were encouraged to create a policy around naloxone access in the school if there was not one in place. None of the schools selected were able to approve direct naloxone distribution to the students during assemblies, but all were willing to create a policy around having naloxone available in the school through either a school nurse's office, or an overdose response station. Seven high schools in total were selected for school-wide student assembly presentations, and two of the high schools selected invited feed-in local middle schools to attend.

Compliance and Ethical Standards

Ethical considerations for student participation in electronic surveys included making participation voluntary and anonymous. Although students were not required to participate in surveys, participation was described as helpful for program evaluation, and improvement. Voluntary completion of surveys implied consent for participation, and all survey questions were approved by school administrations prior to assembly presentations. No identifying information was collected, and informed consent for publication was not required. The study did not qualify as human subjects' research given it being a non-generalizable program evaluation.

Program Implementation

Each assembly was scheduled for a 45-minute period to align with a regular class session at the school. One bereaved parent presenter and one program staff member arrived at the school one hour prior to each assembly to set up and meet with school administrators. Naloxone doses were left with the administration prior to the presentation, with the understanding that an internal policy would be created around access and distribution. School administrators arranged for technical assistance to be present for each assembly presentation, including audio and visual resources. Students were asked to scan a QR code with their cell phones as they entered the auditorium or gymnasium. This QR code was prominently displayed on a screen and was linked to a pre-assembly survey. As students took their seats, they were asked to fill out the pre-assembly survey.

The assemblies commenced with an introductory video documentary called "Dead on Arrival," which has received several awards for best documentary and was specifically created for student audiences. Following the video, a bereaved parent shared their testimony about their child. Then program staff presented an educational slideshow that included facts about fentanyl and counterfeit pills, along with information about overdose recognition and response. Nasal naloxone use was demonstrated on stage, and students were instructed to speak with school administrators about accessing naloxone after the presentation. Towards the conclusion of the presentation, students were allotted 5-10 minutes for a question-and-answer session with presenters. Subsequently, students were prompted to scan a QR code for a post-presentation survey.

Data Collection and Analysis

Quantitative data from pre and posttest surveys were analyzed using IBM SPSS version 29.0. Numerical scale-score variables were explored using descriptive statistics (mean, standard deviation), and categorical variables were explored using proportions and frequency tables. All construct questions of the health belief model were on a 10-point Likert scale (from strongly disagree to strongly agree), and scoring was from 1 to 10. Higher scores mean higher perceived severity, susceptibility, benefits, barriers, and self- efficacy. An independent samples t-test was performed for each paired pre and posttest scale score variable. Mean differences, and p-values were recorded for each item in table form.

Positive predictive scores were assigned for posttest participants by adding their post-assembly self-reported intention to reduce or abstain from drug misuse behaviors (10-point Likert scale), and whether they intended to share what they had learned with a family member or friend (5-point Likert scale). Higher scores indicate a greater intention to change drug misuse behaviors and act as community ambassadors for prevention messaging. Positive predictive scores were then compared between different participant groups to see whether there were

significant differences. Student t test was used to compare quantitative data between two independent groups, and One Way ANOVA test was used to compare more than two groups.

Pearson's correlation coefficient was used to measure correlations between different quantitative data. Linear regression analysis was used to measure independent effects of different variables on positive predictive score. P value ≤ 0.05 was considered statistically significant.

RESULTS

There were 1,275 students who participated in the pre-assembly survey. Most of the respondents were between the ages of 14 and 17 (83.8%, 1,068/1,275) and attending high school (97.6%, 1,244/1,275). Over one in nine respondents were Hispanic or Latino (12.7%, 162/1,275) and over two thirds of respondents were White or Caucasian (68.2%, 870/1,275). There was a comparable number of male (45.3%, 578/1,275) and female (47.8%, 610/1,275) respondents, and nearly two thirds were from Alaska (66.3%, 845/1,275). In total, 14.0% (178/1,275) of students reported at least one-time use of alcohol, marijuana, unprescribed pills or illicit drugs within 30 days of the assembly presentation.

There were 854 students who participated in the post-assembly survey. Most of the respondents were between the ages of 14 and 17 (84.2%, 719/854) and attending high school (94.8%, 810/854). Over one in nine respondents were Hispanic or Latino (12.2%, 104/854) and over two thirds of respondents were White or Caucasian (68.4%, 548/854). There was a comparable number of male (45.9%, 392/854) and female (49.1%, 419/854) respondents, and nearly two thirds were from Alaska (65.6%, 560/854). A summary of pre- and post-assembly survey participant characteristics is presented in Table 1.

Table 1. Distribution of Demographic Variables, Location, Grade Level, Drug Misuse Behavior

Variable	Response option	Pretest N1=1,275 n (%)	Posttest N2=854 n (%)
Age	11 or younger	4 (0.3)	1 (0.1)
	12	11 (0.9)	1 (0.1)
	13	7 (0.5)	10 (1.1)
	14	100 (7.8)	88 (10.3)
	15	347 (27.2)	180 (21.1)
	16	326 (25.6)	236 (27.6)
	17	295 (23.1)	215 (25.2)
	18 or older	185 (14.5)	123 (14.4)
Gender	Female	610 (47.8)	419 (49.1)
	Male	578 (45.3)	319 (45.9)
	Other	46 (3.6)	22 (2.6)
	Prefer not to say	41 (3.2)	21 (2.5)
Ethnicity	Hispanic or Latino	162 (12.7)	104 (12.2)
	Not Hispanic or Latino	1,113 (87.3)	750 (87.8)
Race	Black or African American	45 (3.5)	29 (3.4)
	White of Caucasian	870 (68.2)	584 (68.4)
	American Indian or Alaska Native	62 (4.9)	38 (4.4)
	Asian	108 (8.5)	81 (9.5)
	Native Hawaiian or Pacific Islander	21 (1.6)	30 (3.5)

	Some other race or Multiracial	169 (13.3)	92 (10.8)
Location	Alaska	845 (66.3)	560 (65.6)
	Ohio	268 (21.0)	140 (16.4)
	Michigan	162 (12.7)	154 (18.0)
Grade	6^{th}	14 (1.1)	2 (0.2)
	7^{th}	6 (0.4)	1 (0.1)
	8^{th}	11 (0.9)	41 (4.8)
	9^{th}	351 (27.5)	181 (21.2)
	10^{th}	325 (25.5)	219 (25.6)
	11^{th}	310 (24.3)	232 (27.2)
	12^{th}	258 (20.2)	178 (20.8)
PreMisuse Behavior	Never	1097 (86.0)	-
	1-2 times a month	89 (7.0)	-
	Weekly	32 (2.5)	-
	2-3 times a week	17 (1.3)	-
	Daily	40 (3.1)	-

Statistically significant pre to posttest mean differences were observed across each construct of the Health Belief Model measured. Posttest mean perceived severity score was 0.6 points higher than pretest mean score ($p<0.001$), posttest mean score for self-efficacy to recognize the signs of an opioid overdose was 1.1 points higher than pretest mean ($p<0.001$), posttest mean self-efficacy score to respond to an opioid overdose was 1.5 points higher than pretest score ($p<0.001$), posttest mean score for perceived benefit of drug abstinence was 0.8 points higher than pretest mean scores ($p<0.001$). Posttest mean score for perceived susceptibility to witnessing or experiencing a life-threatening overdose was estimated to be 0.9 points higher than pretest scores ($p<0.001$), and posttest mean score for perceived barriers to accessing naloxone was 2.2 points lower than pretest scores ($p<0.001$). A summary of attitude scale score mean differences is presented in Table 2.

Table 2. Mean attitude differences among pre and posttest scale score items

Variable	Description	Pretest Mean (SD) (n1=1275)	Posttest Mean (SD) (n2=854)	Mean Difference (p-value)
PSevere	Perceived severity of fentanyl and counterfeit pill use	8.7 (2.0)	9.3 (1.4)	0.6 (<0.001)
SERecognize	Self-efficacy to recognize the signs of an opioid overdose	6.2 (2.7)	7.3 (2.3)	1.1 (<0.001)
SERespond	Self-efficacy to respond to an opioid overdose	5.5 (2.8)	7.0 (2.5)	1.5 (<0.001)
PBenefit	Perceived benefit of drug abstinence	7.6 (3.3)	8.4 (2.8)	0.8 (<0.001)

PSusceptible	Perceived susceptibility to witnessing or experiencing an overdose	4.4 (3.0)	5.3 (3.0)	0.9 (<0.001)
PBarriers	Perceived barriers to accessing naloxone	7.2 (3.3)	5.0 (3.3)	-2.2 (<0.001)

Predictive scores ranged from 2-15 with a mean of 12.54 ± 3.17. Relation between predictive scores and participants' characteristics showed that younger age groups had a lower score compared to older age groups ($p<0.05$). Females had significantly higher scores compared to other genders ($p<0.05$). Participants located in Michigan had significantly higher scores compared to other areas ($p<0.05$). Regarding grade level, high school grades had higher scores compared to middle school ($p<0.05$). No significant relation was found between predictive scores and race or ethnicity ($p>0.05$) (Table 3).

Table 3. Relation between positive predictive score and posttest participants' characteristics

Variable	Response option	N	Avg. Positive Predictive Score
Age	13 or younger	12	11.1
	14	88	11.8
	15	236	12.3
	16	180	12.4
	17	215	12.8
	18 or older	123	13.5
		P-value [a]	<0.001
Gender	Female	419	13.0
	Male	392	12.2
	Other	22	9.4
	Prefer not to say	21	12.9
		P-value [a]	<0.001
Ethnicity	Hispanic or Latino	104	12.3
	Not Hispanic or Latino	750	12.6
		P-value [b]	0.27
Race	Black or African American	29	12.8
	White of Caucasian	584	12.4
	American Indian or Alaska Native	38	13.2
	Asian	81	13.3
	Native Hawaiian or Pacific Islander	30	12.4
	Some other race or Multiracial	92	12.2
		P-value [a]	0.15
Location	Alaska	560	12.4
	Ohio	140	12.1
	Michigan	154	13.5

		P-value [a]	<0.001
Grade	Middle School	44	11.2
	9th	181	12.3
	10th	219	12.3
	11th	232	12.4
	12th	178	13.5
		P-value [a]	<0.001

[a] One Way ANOVA test
[b] Student t test

There was statistically significant positive correlation between predictive scores and all overdose prevention Health Belief Model construct scores except for perceived barriers to accessing naloxone where the correlation was not statistically significant (p>0.05) (Table 4).

Table 4. Correlation Between Predictive Score and HBM Posttest Construct Scores

Construct	Predictive Score	
	r[a]	P-value
Perceived Severity	0.28	<0.001
Self-Efficacy to Recognize an OD	0.13	<0.001
Self-Efficacy to Respond to an OD	0.14	<0.001
Perceive Benefit	0.28	<0.001
Perceived Susceptibility	0.09	0.005
Perceived Barriers	0.03	0.368

[a] Pearson's correlation coefficient

Linear regression was performed to measure independent effects of different variables on predictive score and showed that female gender, perceived severity, perceived benefit, and perceived barriers were associated with higher predictive scores (p<0.05). The strongest predictor was perceived benefit of drug abstinence as it had the highest standardized coefficient (0.21) followed by the perceived severity of consequences from fentanyl and counterfeit pill use (0.19) (Table 5).

Table 5. Linear Regression Analysis for Factors Affecting Predictive Score

	Unstandardized Coefficients		Standardized Coefficient	T	Sig	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Constant	4.495	0.78		5.79	<0.001	2.97	6.02

Female Gender	0.62	0.20	0.10	3.06	0.002	0.22	1.02
Living in Michigan	0.33	0.30	0.04	1.11	0.27	-0.25	0.91
Grade level	0.04	0.22	0.01	0.16	0.88	-0.40	0.47
Age	0.26	0.20	0.10	1.33	0.18	-0.13	0.65
PSevere	0.41	0.08	0.19	5.45	<0.001	0.26	0.56
SERecognize	-0.02	0.06	-0.01	-0.35	0.73	-0.14	0.09
SERespond	0.08	0.05	0.06	1.41	0.16	-0.03	0.18
PBenefit	0.23	0.04	0.21	6.11	<0.001	0.16	0.31
PSusceptible	0.05	0.03	0.05	1.55	0.12	-0.01	0.12
PBarriers	0.07	0.03	0.07	2.11	0.04	0.01	0.13

DISCUSSION

This article reports on the initial outcomes of a school-based pilot program aimed at raising awareness about fentanyl and counterfeit pills, overdose recognition and response, and increasing naloxone access for adolescents through distribution in schools. It's important to note that while decreasing drug misuse behavior stands as a long-term objective of the program, 12-month follow up data has yet to be collected and compared with baseline data. The program recognizes that behavior changes may be influenced by many factors including concurrent program impacts in the areas where this pilot program was implemented. Taking this into consideration, the program was successful in achieving several of its primary objectives.

First, the pilot program demonstrated success in engaging seven schools across three states and five towns recently affected by adolescent overdose incidents, or fentanyl-related fatality. The utilization of school-wide assemblies featuring bereaved parent testimonies, fentanyl awareness, and overdose prevention education, along with naloxone distribution suggests that school-based assemblies are a feasible strategy for engaging schools with naloxone accessibility and overdose prevention protocols. Furthermore, the inclusion of middle schools in certain areas extended fentanyl awareness education to a wider range of adolescent subgroups.

Second, the program demonstrated statistically significant attitude changes that were informed by the constructs of the Health Belief Model: perceived severity, perceived susceptibility, self-efficacy, perceived benefit, and perceived barriers.[7] Notably, the distribution of naloxone to schools and households also acted as a cue to action for scenarios involving a witnessed opioid overdose and increases self-efficacy to act in a crisis situation. This demonstrates the model's potential for guiding similar programs which aim to achieve significant changes in attitudes which, according to an evidence-based theory, can help predict positive behavior changes in adolescent populations like reducing drug misuse behaviors, and adverse

overdose outcomes (administering naloxone, responding to a witnessed overdose, calling emergency medical services, etc.).

Third, survey participants with higher predictive scores indicated a higher likelihood of becoming ambassadors for important overdose prevention information and leaving assemblies with stronger intentions to reduce or abstain from drug misuse. This article provides evidence that predictive scores have a positive relationship with perceived threat, self-efficacy, and perceived benefit scores. Notably, perceived benefit of drug abstinence, and perceived severity of fentanyl and counterfeit pill use were key indicators for high predictive scores. Therefore, focusing on these constructs for future interventions could be important for improving intentionality to reduce drug misuse in adolescents. Long-term follow up is needed to assess the protective effects of initial predictive scores and their impact on drug misuse behaviors and health outcomes. Nevertheless, these findings do underscore the value of school-based overdose prevention initiatives in disseminating crucial public health information and increasing intention to reduce drug misuse among adolescents.

Additional research is warranted to explore school-based approaches for direct naloxone distribution to students. This activity is hindered by many factors, including stigma and school-specific policies. Many high schools have rigid policies relating to student possession of medications while on school premises, thereby potentially delaying responses to a witnessed overdose. There also exist stigmatizing misconceptions surrounding naloxone, including the notion that its availability to adolescent populations leads to higher rates of opioid misuse, despite such assertions being debunked in other studies.[10] There also exists a stigmatizing belief that naloxone is reserved for populations with an opioid use disorder (OUD), however it's been reported that two in three of adolescent overdose decedents have no opioid use history, yet 90% die from opioids.[6]

There are limitations to this pilot program. The program targeted adolescent populations across three states, spanning five different towns with very different demographic make-ups, but implemented in predominant white Caucasian student populations. The main reason for this is that the program was implemented where opportunities presented themselves through tragedy-focused outreach. Consequently, the findings cannot be generalized to the broader adolescent population. Also, pre and posttest data was collected separately, creating two independent samples collected from the same student pool which was an administrative oversight. Paired survey data could yield higher-quality evidence of program effectiveness, and the program plans to pair surveys for future implementation.

Taking these limitations into account, this program provides valuable insights into specialized school-based programming tailored for adolescents, particularly in preventing fentanyl and counterfeit pill use. The incorporation of bereaved parent testimonials, and use of the Health Belief Model to guide curriculum and data collection have enhanced the program's execution and impact. Further exploration of such prevention strategies is warranted to address the pressing public health concern of adolescent drug misuse and overdose.

Conclusion

Utilizing the Health Belief Model and bereaved-parent testimony in school-based fentanyl awareness and overdose prevention programs has shown promise in driving significant attitude changes in adolescent populations. Theory-based approaches can be instrumental for

public health interventions aimed at encouraging engagement with prevention behaviors that may have positive impacts on health outcomes for school-aged populations facing fentanyl-related overdoses. The use of school-based overdose prevention assemblies serves as an effective means to disseminate critical public health information, especially regarding emerging and urgent public health threats like illicit fentanyl and counterfeit pills. These initiatives can help equip adolescents with the knowledge and awareness necessary to combat these pressing public health challenges.

REFERENCES

1. Fentanyl facts. Centers for Disease Control and Prevention. June 27, 2023. Accessed August 15, 2023. https://www.cdc.gov/stopoverdose/fentanyl/index.html.
2. Ahmad F, Cisewski J, Rossen L, Sutton P. Provisional drug overdose death counts. National Center for Health Statistics. August 16, 2023. Accessed August 22, 2023. https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm.
3. Friedman J, Godvin M, Shover CL, Gone JP, Hansen H, Schriger DL. Trends in drug overdose deaths among US adolescents, January 2010 to June 2021. *JAMA*. 2022;327(14):1398. doi:10.1001/jama.2022.2847
4. Jones CM, Clayton HB, Deputy NP, et al. Prescription opioid misuse and use of alcohol and other substances among high school students — youth risk behavior survey, United States, 2019. *MMWR Supplements*. 2020;69(1):38-46. doi:10.15585/mmwr.su6901a5
5. DEA Laboratory Testing Reveals that 6 out of 10 Fentanyl-Laced Fake Prescription Pills Now Contain a Potentially Lethal Dose of Fentanyl | DEA.gov. United States Drug Enforcement Administration. 2023. Accessed August 15, 2023. https://www.dea.gov/alert/dea-laboratory-testing-reveals-6-out-10-fentanyl-laced-fake-prescription-pills-now-contain.
6. Tanz LJ, Dinwiddie AT, Mattson CL, O'Donnell J, Davis NL. Drug overdose deaths among persons aged 10–19 years — United States, July 2019–December 2021. *MMWR Morbidity and Mortality Weekly Report*. 2022;71(50):1576-1582. doi:10.15585/mmwr.mm7150a2
7. Rosenstock IM. Historical origins of the health belief model. *Health Education Monographs*. 1974;2(4):328-335. doi:10.1177/109019817400200403

8. Urich A. The health belief model. Methods for Stress Management. 2017. Accessed August 16, 2023. https://psu.pb.unizin.org/kines082/chapter/the-health-belief-model/.
9. Bonar EE, Bohnert AS. Perceived severity of and susceptibility to overdose among injection drug users: Relationships with overdose history. *Substance Use & Misuse*. 2016;51(10):1379-1383. doi:10.3109/10826084.2016.1168447
10. Binswanger IA, Rinehart D, Mueller SR, et al. Naloxone co-dispensing with opioids: A cluster randomized pragmatic trial. *Journal of General Internal Medicine*. 2022;37(11):2624-2633. doi:10.1007/s11606-021-07356-6