Promoting best practices for managing opioid overdoses in the field: A novel project Extension for Community Healthcare Outcomes program for first responders

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ABSTRACT

As the opioid overdose epidemic persists in the United States, it is important to provide specific first responder-oriented continuing education opportunities on interacting with, treating, and assessing individuals who overdose or who have Opioid Use Disorder (OUD). This research brief describes the first Extension for Community Healthcare Outcomes (ECHO) program focused on first responders and opioids, including the content covered and concomitant popularity and the registrants’ objective knowledge and attitudes about opioids. Participation in the ‘First Responders and Opioids ECHO’ was free with no attendance requirements. Data include secondary assessment and description of the 9-session curriculum developed to address first responders’ continuing education needs on OUD and overdose as well as objective knowledge and attitudes collected at program registration and granular attendance data by topic. Of 158 registrants, 102 attended at least one program session, with participants attending an average of 3.26 sessions (SD = 2.62). Registrants reported mixed knowledge levels, but even among this voluntary cohort of early adopters, objective knowledge about OUD and best-practice overdose response was only moderate. Registrants generally displayed non-stigmatizing and affirming attitudes and beliefs (e.g., substance use disorder is a treatable illness [M = 1.56, SD = 0.73]), with somewhat less agreement with items focused on harm reduction and medication-based treatment. A plausible case can be made that there is a need for evidence-based continuing education on opioids for first responders and related professionals. A motivated cohort of registrants displayed moderate but inconsistent knowledge and generally favorable attitudes. We encourage further systematic process and outcomes research on this topic.

1. Introduction

The United States (U.S.) opioid overdose crisis is a public health emergency that requires a multidisciplinary response. Record-high numbers of overdose deaths were recorded in the 12 months prior to April 2021, with approximately 75% of those deaths (75,673) involving opioids, representing a single year-over-year increase of nearly 20,000 opioid-involved overdoses (Centers for Disease Control and Prevention, 2021). First responders (emergency medical technicians [EMTs], paramedics, law enforcement, and firefighters) play a critical role in identifying the signs of an opioid overdose and treating persons at the scenes of these emergencies (Simmons et al., 2016; Davis et al., 2014). Training to do so includes obtaining objective knowledge about overdose and its treatment along with developing attitudes supportive of harm reduction (e.g., naloxone administration). There is some evidence that first responders (Krusi et al., 2022) and U.S. residents generally (Agley et al., 2022) may hold misperceptions about overdose and naloxone. It is therefore important to ensure widespread availability of first responder-oriented, high-quality continuing education that addresses response to overdose, management of opioid use disorder (OUD), and harm reduction, as well as potential barriers to use of best practice approaches, such as stigma (Judd et al., 2021; Mackey et al., 2020).

The Project ECHO (Extension for Community Healthcare Outcomes) model combines highly applied didactic training with interactive case discussions to help community practitioners learn how to engage in best-practice decision making around complex health conditions from...
specialists and other providers in the field (Arora et al., 2017). There are currently over 1,500 ECHO programs active in 70 countries, including a program focused on first responder self-care and resilience (Katzman et al., 2021), and at least 21 ECHO programs focused on clinical management of opioids. Surprisingly, no ECHO programs for opioids had been specifically tailored to first responders (The University of New Mexico, 2022). To fill this gap, our team built upon an existing statewide OUD ECHO program (Agley et al., 2019) to develop and launch a novel ‘First Responders and Opioids ECHO’ program in partnership with experts in emergency medicine, law enforcement, and other relevant fields. In this research brief, we describe our experience developing and implementing the program and share measures of objective knowledge and attitudes about overdose, OUD, and naloxone reported by program registrants.

2. Methods

The First Responders and Opioids ECHO offered nine, 60-minute sessions over Zoom videoconferencing technology. Sessions occurred every other week from October 6, 2020, to February 16, 2021. Experts in clinical management of OUD, emergency medicine, public health, clinical pharmacy, law enforcement, and recovery worked closely with partners in state government to develop a didactic curriculum tailored to the needs of first responders that addressed fundamentals of OUD, best practice assessment and interventions strategies, and orientation to statewide resources (topics listed in Table 1). Each ECHO session began with a 20 to 30-minute didactic presentation (slide decks freely available https://oudecho.iu.edu/tracks/first-responders/). This was followed by discussion of a deidentified case presented by community-based practitioners seeking guidance on the best course of care for their patient; case discussions (one per session) were structured to facilitate learning among all participants. The case form was adopted from the ECHO Institute’s OUD series. Sessions were held live with recordings available upon request.

The multidisciplinary expert panel for the First Responders and Opioids ECHO included a psychiatrist, a clinical pharmacist, an emergency department medical director, a firefighter, a paramedic, a sheriff, a peer recovery coach, a community corrections expert, and a judge. Panelists were identified based upon recognized expertise, participation in prior ECHO programs in Indiana, or purposive selection at the suggestion of project team members. These specialists prepared and delivered didactic presentations, raised questions, provided best-practice recommendations during case discussions, and addressed participants’ questions in each session.

Community-based participants were recruited via mailing lists, professional meetings, and advertisements in newsletters and social media. Registration was completed online, and enrollment was free and open to any interested professionals. There were no attendance requirements. Free continuing education/continuing medical education (hereafter CE) credits were offered for each session, contingent on completing a short (6 question) session evaluation (see Supplemental Table 1). The schedule with didactic topics was included in marketing materials and on the (Indiana University Opioid ECHO, 2022) website.

Baseline data collection was integrated with the online registration form. The only fields that required responses were name and contact information (used for registration verification). Then, prospective learners were asked to complete a sequence of optional questions before exiting the registration form. After the program’s conclusion (after all nine sessions were completed), individuals who attended at least 1 session were asked to complete an optional post-test via invitation in the final session, receiving several reminder e-mails. The optional questions included queries about current occupation and years of active professional practice at the time of registration. At both baseline and post-test, participants were asked about objective knowledge and attitudes regarding opioid use, overdoses, substance use disorder (SUD) and OUD, measured using the Opioid Overdose Knowledge Scale (OOKS; 6 items) (Williams et al., 2013), Opioid Overdose Attitudes Scale (OOAS; 8 items) (Williams et al., 2013), and Substance Abuse Attitude Survey (SAAS; 11 items) (Chappel et al., 1985). Because the SAAS was developed several decades ago, the expert panel and project team crafted four additional items relating to concepts that are of interest now but were not as pertinent when the SAAS was published (e.g., syringe service programs, repeated naloxone administration). We infer face validity for these items because they used the question and response structure of the SAAS and were reviewed iteratively by topical and methodological experts.

Objective knowledge items were scored as correct/incorrect, whereas attitude items were measured on 5-point Likert-type scales (1 = Completely/Strongly Agree to 5 = Completely/Strongly Disagree, respectively). Paired comparisons of data from baseline to post-test were completed for the small subset of individuals who completed both instruments (n = 20) using either repeated measures t-tests or McNemar tests, depending on the data type. All analyses report two-tailed p-values but significance of individual changes is not interpreted because of the small sample combined with high number of pairwise comparisons.

The data used in this research brief were initially collected as part of the quality improvement evaluation of the First Responders and Opioids ECHO, so participants were not provided payment or incentives for completing any surveys. The Indiana University Institutional Review Board provided approval for use of these data.

3. Results

A total of 158 individuals registered for the First Responders and Opioids ECHO program after excluding affiliates of the project team who registered. Registrants were a diverse cohort of behavioral health professionals (29.1 %), EMTs or EMT trainers (4.4 %), firefighters (1.3 %), medical professionals (9.5 %), paramedics (1.3 %), peer recovery coaches (10.1 %), police/law enforcement (8.2 %), and other occupations (36.1 %) such as probation officers and community health workers. Registrants reported an average of 12.13 (SD = 11.39; n = 150) years of work completed within their occupations. Among the 158 registrants, 102 (64.6 %) attended at least one session and an additional 27 non-
registered individuals also attended (see Table 1). The average number of people attending each session was 46.78 (SD = 8.91), and the mean attendance per participant was 3.26 sessions (SD = 2.62). Of the 129 unique program attendees (e.g., 102 registrants plus 27 non-registrants), 58 submitted at least one CE session evaluation, with an average of 2.88 CE session evaluations submitted among those 58 people (e.g., 167 CE session evaluations completed). Data from the CE evaluations were extremely positive (see Supplemental Table 1).

Baseline objective knowledge and attitudes are summarized in Table 2. The knowledge item answered correctly by the highest proportion of respondents was “How long does naloxone take to start having an effect?” (85.6 %), whereas fewer respondents correctly answered items requiring multiple choices (“Which of the following are indicators of an opioid overdose? [select all that apply]”). For example, only 12.8 % of registrants correctly navigated the previous question, which consisted of 6 true and 4 false statements, though partially correct answers were common, with high variability between statements (e.g., 95.3 % correctly identified unresponsiveness as an indicator but only 43.0 % did so for deep snoring; see Table 2).

Trainees tended to express positive or evidence-based attitudes, like, “Substance use disorder is a treatable illness” (M = 1.56, SD = 0.73, n = 135) and “If someone overdoses, I want to be able to help them” (M = 1.67, SD = 1.03, n = 142). At the same time, there was some variability in other attitudes toward harm reduction, such as for the item, “Naloxone should be administered to any person suffering from opioid overdose without limiting the number of doses given or number of times a person overdoses” (M = 2.25, SD = 1.13, n = 132).

Comparisons between baseline data and post-test data for a limited, self-identified subsample of individuals are provided in Supplemental Table 2. Changes in knowledge and attitudes ranged from completely static (i.e., no change) to modest improvements, but whether any such changes were due to chance alone or the ECHO program cannot be determined with a meaningful degree of confidence through these analyses.

4. Discussion

Our novel First Responders and Opioids ECHO was attended by more than 100 individuals with diverse occupational backgrounds and experiences who engaged with the program for more than three hours, on average. While varied factors likely contributed to attendance (e.g., advertising, ability to obtain CE, interest in the content), one might infer that similar programs using similar approaches might also successfully recruit learners. In qualitative research from five other ECHO programs in the same state, general interest in education was described more often than CE credits themselves as a motivating factor for participation (Agley et al., 2021). We also hypothesize, but do not have sufficient evidence to state with certainty, that other cohorts of professionals recruited for similar programs might display some of the baseline characteristics identified here, such as relatively favorable attitudes around substance use and a moderate but not comprehensive knowledge base around overdose and naloxone.

With that perspective in mind, we note that registrants approached the program with relatively high desire to help someone who overdoses, and to implement best-practices for treatment and assessment. However, they expressed comparatively less confidence in treating an overdose and about the benefits of using MOUD and had somewhat less-positive attitudes and beliefs about some aspects of harm reduction (even those attitudes were better than neutral). Moreover, participants demonstrated limited objective knowledge about the full array of signs and symptoms of opioid overdoses. Collectively, these findings suggest that continuing education in these areas may be needed and warranted, since it stands to reason that motivated and/or self-identified participants are more likely to have knowledge about opioid overdose than a distribution of people who are not uniformly motivated. The included curricular content — especially didactic presentations and discussions

| Table 2 | Objective Knowledge and Attitudes of Registered Participants at Baseline. |
|-----------------|-----------------|-----------------|
| **Variable**    | **% Correct**   | **Obs** |
| **Objective Knowledge** |                  |              |
| Which of the following factors increases the risk of a heroin (opioid) overdose? (select all that apply) | 60.4a | 149 |
| “Taking longer than usual doses of heroin” [T] | 93.3 | 149 |
| “Switching from smoking to injecting heroin” [T] | 81.2 | 149 |
| “Using heroin with other substances, such as alcohol or sleeping pills” [T] | 89.9 | 149 |
| “Increase in heroin purity” [T] | 86.6 | 149 |
| “Using heroin again after not having used for a while” [T] | 89.9 | 149 |
| “Using heroin when no one else is present around” [T] | 78.5 | 149 |
| “A long history of heroin use” [T] | 69.1 | 149 |
| “Using heroin again soon after release from prison” [T] | 85.9 | 149 |
| Which of the following are indicators of an opioid overdose? (select all that apply) | 12.8b | 149 |
| “Blotting blood-shot eyes” [F] | 83.2 | 149 |
| “Slow or shallow breathing” [T] | 91.9 | 149 |
| “Lips, hands, or feet turning blue” [T] | 84.6 | 149 |
| “Loss of consciousness” [T] | 94.0 | 149 |
| “Unresponsive” [T] | 95.3 | 149 |
| “Fitting” [F] | 83.9 | 149 |
| “Deep snoring” [T] | 43.0 | 149 |
| “Very small pupils” [T] | 61.7 | 149 |
| “Agitated behavior” [F] | 74.5 | 149 |
| “Rapid heartbeat” [F] | 66.4 | 149 |

| **Attitudes** | **Mean (SD)** | **# Obs** |
|---------------|---------------|-----------|
| **Opioid overdose Attitudes Scale Items** | | |
| I would be afraid of giving naloxone in case the person becomes aggressive afterward (R). | 3.74 | 143 |
| I would be afraid of giving naloxone in case the person becomes aggressive afterward (R). | 3.48 | 143 |
| I would be afraid of giving naloxone in case the person becomes aggressive afterward (R). | 4.04 | 142 |
| I would be afraid of giving naloxone in case the person becomes aggressive afterward (R). | 3.93 | 143 |
| I would be afraid of giving naloxone in case the person becomes aggressive afterward (R). | 3.50 | 143 |
| I would be afraid of giving naloxone in case the person becomes aggressive afterward (R). | 2.61 | 142 |
| I would be afraid of giving naloxone in case the person becomes aggressive afterward (R). | 1.67 | 142 |

(continued on next page)
Specifically, this research brief advances the field in two primary ways. First, it shows that it is plausible that, even among the wide variety of opioids, naloxone have shown a high favorability among participants (Simmons [11.6%] rather than getting it incorrect (2.7%). Many respondents who did not get the item correct responded that they didn’t know for this question.

Our results stem from cross-sectional data collection and should be interpreted cautiously. We discourage the use of these data as the sole means to support any specific decision or action, or to make any definitive claims. However, we believe our findings can be used alongside other knowledge to allow informed decision making about continuing education for first responders and related professionals. Specifically, this research brief advances the field in two primary ways. First, it shows that it is plausible that, even among the wide variety of other ECHO programs being offered, there may be both an interest in, and a need for, first responder-focused continuing education focused on opioids. Second, it provides preliminary information as to the extent of objective knowledge about opioids and overdose, and the attitudes related thereto, that might be reasonable to expect from a motivated group of voluntary registrants for such a program. Future iterations of this program should seek funding to support more robust data collection, both in terms of proximal (e.g., knowledge and attitudes) and distal outcomes (e.g., changes in practice, behavioral intentions).

### CRediT authorship contribution statement

**Alexander P. Oliver:** Writing – original draft, Data curation, Formal analysis. **Zachary W. Adams:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Project administration, Funding acquisition. **Carol A. Ott:** Conceptualization, Writing – review & editing. **Jon Agley:** Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Data curation.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Data availability

Data will be made available on request.

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### Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pmedr.2022.102038.

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### Table 2 (continued)

| Variable                                                                 | % Correct | Obs (n) |
|-------------------------------------------------------------------------|-----------|---------|
| Substance Abuse Attitude Survey Items                                    | 2.98      | 134     |
| Substance use disorder is a treatable illness.                          | 1.09      |         |
| A substance dependent person cannot be helped until he/she has hit rock bottom (R). | 1.03      |         |
| A substance user who has relapsed several times probably cannot be treated (R). | 3.07      |         |
| Substance use disorder is associated with a weak will (R).              | 1.01      |         |
| Most persons with substance use disorder are unpleasant to work with as patients (R). | 1.03      |         |
| Heroin is so addicting that no one can really recover once they become addicted (R). | 1.00      |         |
| Coercive pressure, such as threat or punishment, is useful in getting resistant patients to accept treatment (R). | 1.00      |         |
| Expert Panel Items                                                      | 2.25      | 132     |
| Naloxone should be administered to any person suffering from opioid overdose without limiting the number of doses given or number of times a person overdoses. | 1.13      |         |
| Harm reduction programs are an important tool to decrease the spread of infectious diseases. | 0.89      |         |
| Fewer syringes are found in the streets and public places when a community has a syringe service program. | 1.29      |         |
| Medication-assisted treatment is essential to successful recovery in opioid use disorder. | 1.00      |         |

a [0: Incorrect; 1: Correct] for Objective Knowledge.

b Percent of participants that selected all response options correctly to receive full credit for the item.

c Note: Respondents could affirmatively select “Don’t know” for this question.

d Most of those who did not get the item correct responded that they didn’t know (11.6%) rather than getting it incorrect (2.7%).

e Note: Respondents could affirmatively select “Don’t know” for this question.

f Percent of participants that selected all response options correctly to receive full credit for the item.

| Obs (n) |
|---------|
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