

Some law enforcement officers' negative attitudes toward overdose victims are exacerbated following overdose education training

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ABSTRACT

Background: The devastating impact of the current opioid overdose crisis has led to new involvement of law enforcement officers. Training programs have focused on overdose recognition and response without targeting core attitudinal change by covering addiction or harm reduction principles.

Objectives: This study examined the impact of a comprehensive overdose education and naloxone distribution (OEND) training on officers' attitudes toward overdose victims, knowledge of and competence to respond to an opioid overdose, and concerns about using naloxone. The training included the common information about overdose recognition and response, with added components covering broader content about addiction and harm reduction principles and philosophies.

Methods: A total of 787 (83% male) officers were administered surveys before and after attending a 2.5–3 hour comprehensive OEND training. Survey items measured overdose-related knowledge and attitudes, including attitudes about people who use drugs and who overdose.

Results: Following the training, participants' overdose-related knowledge and perceived competence to use naloxone improved. However, there were more nuanced changes in attitudes toward overdose victims: though 55.3% of officers reported more positive post-training attitudes, 31% reported more negative attitudes, and 13.7% reported no attitudinal change. Younger officers were most likely to report worsened attitudes. Improvements in attitudes toward overdose victims were associated with reductions in both naloxone-related concerns and risk compensation beliefs.

Conclusions: Despite a comprehensive OEND training that addressed addiction and harm reduction and directly targeted hypothesized drivers of negative attitudes (e.g., risk compensation beliefs), some officers' attitudes worsened after the training. Randomized experiments of different training approaches would elucidate the mediators and moderators underlying these unexpected responses.

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Introduction

The overwhelming scope and scale of the current opioid overdose crisis in the U.S. has necessitated people other than paramedics become prepared and equipped to reverse overdoses with naloxone (1). Law enforcement officers (LEOs) are often called to reverse an overdose when a bystander does not have naloxone or an emergency medical services (EMS) team has not arrived first on the scene. Indeed, in Missouri, though there is no official, mandated, centralized tracking of non-fatal overdose events to know the total number of events nor the proportion responded to by LEOs, police are first on the scene in many jurisdictions, particularly in rural areas where EMS response times are slower. Data from an opt-in Overdose Field Report system created by the authors (mohopeproject.org/ODreport) has gathered over 6,300 reports of overdose events in three-and-a-half years, with 30% ($n = 1,866$) indicating 911 was

called, during which police administered naloxone in 58% ($n = 1,091$) of cases. Thus, though the majority of Missouri's naloxone training and distribution efforts in recent years have rightfully targeted treatment and social service providers, active drug users, and other non-professional first responders most likely to witness an overdose in the community (2) there is a justifiable argument that training LEOs to appropriately recognize and respond to overdoses remains important.

Trainings for LEOs have generally been effective in improving knowledge about overdose and competency in responding to overdose (3–6) and, in some cases, also reducing concerns related to potentially mishandling an overdose event. Though the top priority when responding to an overdose is to resuscitate the victim, what transpires after a person is revived from an overdose – such as receiving information about local treatment options – can have a large impact on enhancing the

victim's motivation to change potentially harmful behaviors (7).

Unfortunately, recent research suggests LEOs' attitudes toward people who use drugs (PWUD) is largely negative (8), with nearly half (43%) of an LEO sample in Pennsylvania believing there should be a limit on how many times someone should receive naloxone, and a majority (83%) believing naloxone access serves as an excuse to continue drug use and that substance use treatment is ineffective (56%). Notably, officers who respond to overdoses more frequently were more likely to hold these and other negative attitudes (8). Regarding stigma toward drug use more generally, prior work has also shown LEOs often blame PWUD for their "poor life choices" (9) and for overdose events specifically (5). Importantly, negative beliefs regarding LEO involvement in overdose response is not limited to police; PWUD also hold concerns. For example, qualitative research with drug users has demonstrated pervasive fears associated with calling 911 for overdose events (10), with frequent fears of arrest for the victim and/or witness despite the presence of a Good Samaritan law (11) cited as the most common reason for reticence.

To be sure, the involvement of LEOs at these emergency events introduces increased potential for criminalization. The behavior of LEOs while responding to an overdose can influence the public health nature of the response, depending on whether they arrest PWUD or their associates, put them in restraints, and/or confiscate drug paraphernalia, versus refer the overdose survivor to treatment, provide information about community resources, and/or offer verbal support to those present.

To increase access to lifesaving services and the likelihood individuals will call 911 in a future crisis, it is critical for LEOs who respond to overdoses not only to be equipped with naloxone but be willing to facilitate connections to resources and otherwise respond supportively rather than punitively (12). Importantly, research on LEO's behavioral response finds that attitudes regarding a particular crime can affect how they respond to victims of that crime. For example, Page (13) found police officers who endorsed greater acceptance of rape myths (e.g., "Women who dress provocatively are inviting sex") were less likely to find the victim credible. This personal belief structure has implications for criminal investigations and the potential success of legal reforms (13). Negative attitudes toward people involved in a given criminal activity risk heightened tension between LEOs and those involved in the activity.

Previous research on overdose education training programs has demonstrated their effectiveness in teaching emergency responders to respond to overdoses, but have reported either no effect or unexpected effects on

attitudes about overdose and overdose victims. Among LEOs in particular, multiple studies found no change in overall attitudes even when knowledge about overdose and naloxone, competency in responding to an overdose, and concerns about using naloxone at the scene of an overdose all improved (3–6). Additionally, rural emergency medical technicians were more likely to agree with victim-blaming statements (they "need to learn a lesson" and "are to blame" for their overdose) following an overdose training than before (6). The authors surmised the training might have "heightened, rather than alleviated" LEO's concerns that PWUD would engage in riskier behavior if they thought they were less likely to die due to overdose (referred to as "naloxone-related risk compensation beliefs" (14), and, therefore, suggested future trainings should include information about addiction and directly address risk compensation beliefs (6).

As part of a broader effort to saturate communities with naloxone, the authors of the current study helped develop comprehensive training inclusive of content not only related to recognizing and responding to an overdose, but also on addiction, harm reduction, and concerns about enabling drug use. In addition to the basic goal of improving knowledge and competency regarding overdose response, the broader goal was also to improve attitudes to increase LEO's buy-in to a public health-focused approach to drug use and overdose response. The aim of this study was to assess the effectiveness of this comprehensive training for LEOs on improving knowledge, competence, and concerns about responding to overdose, risk compensation beliefs, and, in particular, attitudes toward overdose victims.

Methods

Participants and procedure

Project staff held 30 trainings specifically for LEOs and staff ($N = 787$) in a large urban area of the Midwest, between May 2017 and December 2018. Ninety-three percent ($n = 729$) of LEO training participants completed the pre-survey (described below). Training attendance ranged from 7 to 75 people, with an average of 26 attendees. Of those, 82.7% ($n = 603$) also took the post-survey and were able to be matched, for an overall response rate of 76.6%.

Prior to the training, participants consented and completed the pre-training survey on their phones or tablets when wireless internet was available ($n = 371$), or on paper when it was not ($n = 232$). Electronically-completed surveys were automatically uploaded to REDCap, a web-based survey platform (15,16). Paper

surveys were manually entered by a research assistant following the training. [Author institution] IRB approved this research study.

Trainings were delivered by a transdisciplinary team of four people and lasted approximately three hours, including survey completion time. A Licensed Professional Counselor presented content on the nature of addiction as a brain disease, opioids' effect on the body and brain and the progression of physical dependence (e.g., using for euphoria vs. withdrawal avoidance) and addiction, myths and facts about naloxone access and risk compensation (e.g., the lack of empirical evidence of PWUD using more drugs, or using in riskier ways, if they have access to naloxone (17,18), strategies for talking with someone who was just revived from an overdose (e.g., the benefit of being non-judgmental and empathic over conveying shame and guilt, particular phrases to use or avoid), and a brief overview of evidence-based treatment modalities, particularly the critical role of maintenance medications for opioid use disorder (19–21). An emergency medical physician presented on overdose risk factors, pharmacological mechanisms of naloxone, and how to recognize and respond to an opioid overdose, and also oversaw a cardiopulmonary resuscitation (CPR) practice with a focus on the importance of rescue breathing. The Project Manager presented on substance use prevention efforts, harm reduction principles and examples and outcomes of previous harm reduction efforts grounded in public health principles (e.g., seat belts, helmets, and safe sex education), and Missouri regulations related to overdose responses and interactions with PWUD such as Missouri's 911 Good Samaritan Law (22). An Evaluation Coordinator presented on evaluation efforts, including the project's anonymous Overdose Reporting System and the importance of the training surveys attendees were completing. Trainings were primarily presented using PowerPoint slides, with various participant discussions sparked sporadically throughout. The post-training survey was administered at the conclusion of each training.

Currently, there is no uniform or standardized OEND training implemented across settings and locations. However, based on what can be gathered from the literature, the majority of OEND trainings for LEOs range from 30 minutes to 3 hours and focus on risk factors for opioid overdoses, the effects of naloxone, recognizing and responding to overdose events, and pertinent legislative information (1,3–5,12,23). The trainings for this study incorporated additional content regarding harm reduction beliefs and benefits, background information about OUD development, a review of evidence-based medical treatments, and concurrent

strategies to prevent overdose and treat addiction under way in Missouri and nationwide. .

Measures

Scales

Substantive domains were measured using three scales: (1) a condensed version of the Opioid Overdose Knowledge Scale (OOKS) (24); (2) a revised version of the Opioid Overdose Attitudes Scale (OOAS) (24); and (3) the Naloxone-Related Risk Compensation Beliefs (NaRRC-B) scale (14). Versions of the OOKS and the OOAS have been used in multiple populations, including law enforcement (3,5,6,25). We introduced slight wording changes to the OOAS subscales and added items to the “attitudes toward victims” OOAS subscale, described in more detail below. The NaRRC-B was developed by our team using a larger dataset that is partially inclusive of the present sample (14). All items used for analysis can be found in the [Appendix A](#).

OOKS – measuring overdose response knowledge

We measured knowledge about responding to an opioid overdose using a revised version of the OOKS, including six true/false and three multiple choice questions, and one multiple correct response question that queries individuals' knowledge about how to identify and respond to an overdose. For the true/false and multiple choice questions, participants earned one point for each correct response. For the multiple response question, participants earned one point for every correct selected response and one point for every unselected incorrect response, for a subtotal of 10 correct points, and an overall total of 19 possible OOKS points. We calculated both a total score and percent correct score. Higher scores indicate greater knowledge.

OOAS – including competence, concerns, and attitudes toward overdose victims subscales

Competence in responding to the scene of an overdose was measured with 10 items (e.g., “*If I were called to the scene of an overdose, I would know what to do to help them*”) from the OOAS “competence” subscale with 5-point Likert format options (1 = completely disagree, 3 = unsure, and 5 = completely agree). Two items were reverse-coded. We calculated a mean score across the 10 items. Higher scores indicate greater competence. The Cronbach's Alpha for OOAS competence in this sample is .860.

Concerns about responding to the scene of an overdose were measured using six items (e.g., “*I would be reluctant to use naloxone for fear of precipitating*”).

withdrawal symptoms”) from the OOAS “concerns” subscale with 5-point Likert format options (1 = completely disagree, 3 = unsure, and 5 = completely agree). We calculated a mean score across the six items. Higher scores indicate greater concern about responding to an overdose. As lower scores indicate less concern, the training is intended to reduce the “concerns” score. The Cronbach’s Alpha for OOAS concerns in this sample is .733.

Attitudes toward overdose victims were measured using three items from Wagner et al.’s four-item “attitudes” subscale (5) (e.g., “People who overdose need to learn a lesson from it so they will not do it again”) in addition to three items developed by our team: (1) “People who overdose need to be arrested”; (2) “People who are arrested after an overdose will be motivated to stop using drugs”; (3) “People who overdose deserve life-threatening outcomes as a natural consequence of their actions.” Each item was asked with the same 5-point Likert format options stated above.

We conducted a confirmatory factor analysis to assess the adequacy of the four “attitudes toward overdose victims” subscale with the addition of the three new items. One reverse-coded item from Wagner et al.’s scale (4), “People who overdose need to be referred to drug treatment,” which we slightly reworded as “People who overdose should be offered treatment,” did not adequately load on the latent factor (standardized factor loading = .26). As only factors with standardized loadings above .3 are considered relevant for a specified latent variable (26), we

excluded it from the scale. Thus, the final subscale for analysis uses six items.

We calculated a mean score across the six “attitudes toward overdose victims” items. Higher scores indicate more negative attitudes toward overdose victims, thus a key goal of the training was to reduce the “attitudes toward overdose victims” score. The Cronbach’s Alpha of the modified “attitudes toward overdose victims” subscale in this sample is .745.

Naloxone-related risk compensation beliefs (NaRRC-B)

Naloxone-related risk compensation beliefs were measured using the five-item NaRRC-B scale (14) (e.g., “Opioid/heroin users will use more opioids/heroin if they know they have access to naloxone”) with 5-point Likert format options measuring agreement. Mean scores were computed with higher scores indicating greater endorsement of risk compensation beliefs. Training goals included reducing risk compensation beliefs, so a reduction in mean values indicated a positive effect of training. The Cronbach’s Alpha of the NaRRC-B in this sample is .862.

Results

Demographics

The average age of participants who completed both the pre- and post-surveys (N = 603) was 39.5 (SD = 10.4). To better understand the relationship between age and

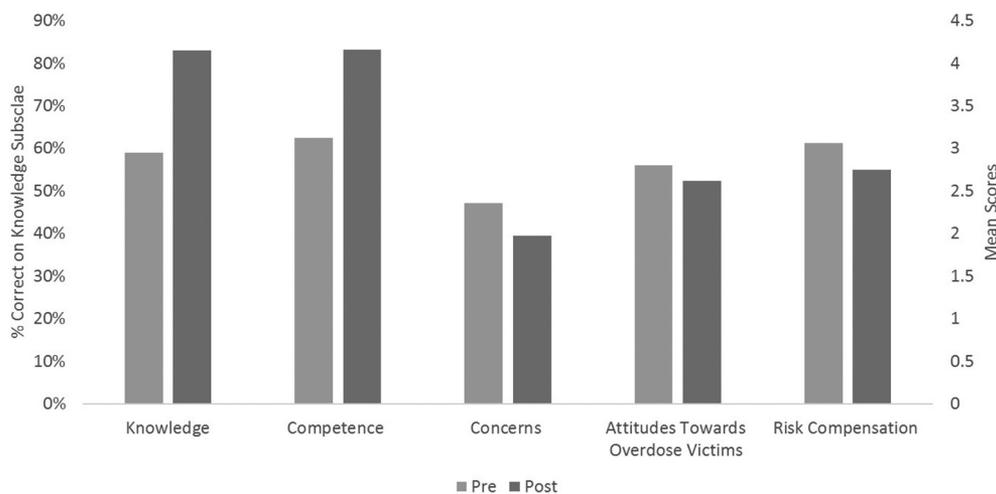


Figure 1. Naloxone and overdose-related knowledge, competence, concerns, attitudes toward overdose victims, and risk compensation belief scores pre- and post-training. Note: All changes were significant at $p < .0001$; A higher score indicates *greater* knowledge about overdose events, *greater* competence in responding to overdose events, *more* concerns about administering naloxone, *more negative* attitudes toward overdose victims and *greater* endorsement of risk compensation beliefs. This figure shows the following changes from pre- to post-training: greater knowledge, greater competence, fewer concerns, fewer negative attitudes, less endorsement of risk compensation beliefs.

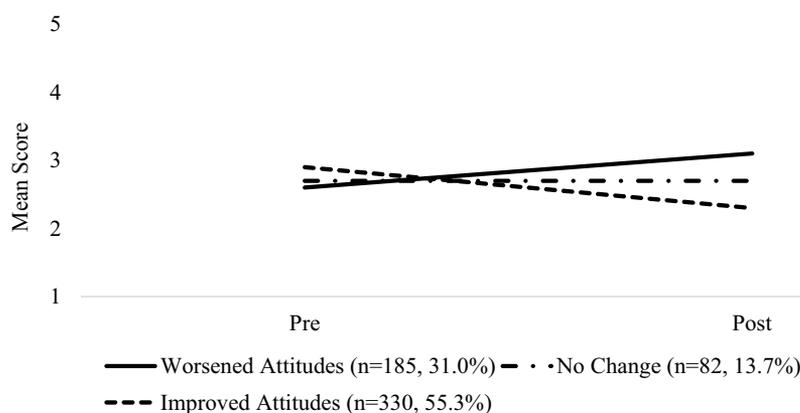


Figure 2. Attitudes toward overdose victims pre- and post-training, by Attitude Change Group (N = 597). Note: A higher score indicates *more negative* attitudes toward overdose victims. Participants were grouped by the changes from pretest to post test for “Attitudes Towards Overdose Victims” subscale scores. Following an approximately 2.5 hour training on overdose recognition and response, general information on opioid use disorder development, prevalence, and treatment, and key harm reduction principles, those in the Worsened Attitude group had the most negative attitudes toward overdose victims, and those in the Improved Attitude group had the most positive attitudes. This indicates the categorization into attitude change groups was not merely reflective of people who started on an “extreme” end of the scale and regressed toward the middle following the training, but of real differences in held attitudes following the training.

survey responses, we categorized age into four groups: 18–29 (19.6%), 30–39 (29.7%), 40–49 (30.0%) and 50+ (16.9%). Eighty-three percent of survey participants were male. The majority of participants identified as White (80.9%), 10.3% as Black, 4.3% reported either multiple races or Asian, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander race, and 4.1% preferred not to answer the question. Two and a half percent of respondents reported Hispanic ethnicity.

Overall training outcomes

We used paired-sample T-tests to assess improvements in training outcomes from pre- to post-training across domains (i.e., knowledge, competence, concerns, attitudes toward overdose victims, and risk compensation beliefs). On average, participants improved across all measured domains (Figure 1). Participant knowledge increased from a mean of 12.99 (68.4% correct) to 17.12 (90.1% correct) ($t(602) = 31.59, p < .0001$). Competence and concerns regarding responding to an overdose increased (from 3.12 to 4.15, $t(597) = 34.46, p < .0001$) and decreased (from 2.36 to 1.97, $t(595) = -16.33, p < .0001$), respectively. Negative attitudes toward overdose victims decreased from 2.80 to 2.62 ($t(596) = -7.57, p < .0001$), and risk compensation belief scores decreased from 3.06 to 2.75 ($t(595) = -10.86, p < .0001$).

Attitudes toward overdose victims (Change groups)

We used item mean change scores from the Attitudes Toward Overdose Victims subscale from the pre- to

the post-survey to group participants into three attitude change groups: Worsened Attitudes (increased scores), No Change, and Improved Attitudes (decreased scores). Of the 597 LEOs trained who completed this subscale (6 participants [of 603] were missing), 55.3% had Improved Attitudes, 31% had Worsened Attitudes, and 13.7% had No Change after the training compared to before the training. Though scores among the Worsened and Improved Attitudes Groups differed at the outset of the training, such that those in the former group entered the training with slightly more favorable attitudes ($F(2, 594) = 7.80, p < .0001$), the difference changed direction and greatly increased by the end of the training. Specifically, the Worsened Attitudes Group had the most negative attitudes after the training, at 3.08 (SD = .80), while the No Change Group’s mean post-training score was 2.72 (SD = .82), and those in the Improved Attitudes Group had the most positive attitudes, at 2.34 (SD = .70) ($F(2, 594) = 59.32, p < .0001$) (See Figure 2). To summarize, at the end of the training, those in the Worsened and Improved change groups had the most negative and positive attitude scores, respectively, suggesting the changes demonstrated were not simply reflective of a regression toward the mean effect.

Demographic differences by attitude change group

We used Pearson’s chi-square with Bonferonni-corrected pairwise comparisons to determine the extent to which attitude change groups varied by participant sex, race, and

Table 1. Demographics of Sample and of Attitude Change Groups (Worsened Attitudes, No Change, Improved Attitudes).

	Sample (N = 595)	Worsened Attitudes (n = 184)	No Change (n = 81)	Improved Attitudes (n = 330)
Mean Age (SD)	39.46 (10.4)	37.42 (9.7) ^A	38.2 (10.5)	40.8 (10.43) ^B
Age				
18–29	117 (19.6%)	39 (21.1%)	24 (29.3%) ^C	54 (16.4%) ^D
30–39	178 (29.9%)	67 (36.2%)	22 (26.8%)	89 (27.0%)
40–49	181 (30.0%)	49 (26.5%)	24 (29.3%)	106 (32.1%)
50+	102 (16.9%)	24 (13.0%)	10 (12.2%)	66 (20.0%)
Male	495 (83.1%)	154 (83.2%)	70 (85.4%)	271 (82.1%)
Hispanic	15 (2.5%)	5 (2.7%)	1 (1.2%)	8 (2.4%)
Race				
White	484 (81.3%)	153 (82.7%)	65 (79.3%)	266 (80.6%)
Black	61 (10.3%)	14 (7.6%)	10 (12.2%)	37 (11.2%)
Multiracial or Other*	25 (4.2%)	9 (4.9%)	5 (6.1%)	11 (3.3%)
Refused	25 (4.2%)	8 (4.3%)	1 (1.2%)	16(4.8%)

*Other race includes Asian, American Indian/Alaskan Native, or Native Hawaiian/Pacific Islander.

^Aand ^B have a significant difference at $p < .01$

^Cand ^D have a significant difference at $p < .05$

age group (Table 1). Attitude change groups did not vary by race or sex. However, differences were identified by age group ($\chi^2(6, N = 574) = 15.4, p = .017$). Specifically, participants whose attitudes worsened during the training were more likely to be between 18 and 29 years of age, relative to any of the other age groups ($p < .05$). We used a one-way ANOVA to further investigate potential differences by age group for mean Attitude Toward Overdose Victims subscale scores on the pre and post surveys to assess the extent to which age was associated with attitudes at the beginning and end of the training in addition to how they changed. There were significant differences by age group at pre ($F(3, 573) = 8.46; p < .0001$) and post ($F(3, 573) = 10.36; p < .0001$). At pre, participants between 18–29 had the most negative Attitudes Toward Overdose Victims ($M = 2.99, 95\% \text{ CI } [2.86, 3.13]$), with scores significantly more negative than the 40–49 ($M = 2.77, \text{ CI } 95\% [2.66, 2.87], p = .047$) and 50+ ($M = 2.52, \text{ CI } 95\% [2.38, 2.65], p < .0001$) age groups. Similar to pretest, at post, the 18–29 age group demonstrated worse Attitudes Toward Overdose Victims ($M = 2.84, \text{ CI } 95\% [2.68, 2.99]$) compared to the 40–49 ($M = 2.51, \text{ CI } 95\% [2.40, 2.62], p = .004$) and 50+ groups ($M = 2.33, \text{ CI } 95\% [2.19, 2.48], p < .0001$).

Within and between group comparisons of attitudes toward overdose victims change groups with other training metrics

Within-group comparisons were assessed using paired T-tests to determine the extent to which knowledge, concerns, competencies, and risk compensation beliefs changed from pre- to posttest among members of each Attitude Toward Overdose Victim change group. Additionally, a between group comparison was conducted using a one-way ANOVA with Tukey's post hoc comparisons to determine whether people each

change group changed similarly across other training metrics (see Table 2).

Knowledge

Knowledge increased among participants in all three Attitude Toward Overdose Victims change groups. The Worsened Change Group improved their knowledge by 21.9%, ($SD = .17, t(184) = 17.67, p < .0001$), while the No Change Group improved by 21.4% ($SD = .15, t(81) = 12.58, p < .0001$) and the Improved Change Group improved their knowledge by 21.8% ($SD = .17, t(329) = 23.56, p < .0001$). There was no difference across the three attitude change groups in their knowledge gains ($F(2, 594) = .034, p = .967$).

Competence

Competence in responding to an overdose increased across all three attitudes change groups. The Worsened Change Group improved by 1 point of a 5-point scale ($SD = .8$) ($t(184) = 18.79, p < .001$), the No Change Group by 0.9 ($SD = .6$) ($t(81) = 12.80, p < .001$), and the Improved Change Group by 1.1 ($SD = .7$) ($t(329) = 25.93, p < .001$). There was no difference across the three attitude change groups in their competence gains ($F(2, 594) = 1.288, p = .277$).

Concerns

Concerns about responding to an overdose were reduced among each of the attitude change groups. Concerns among the Improved Change Group were reduced by .5 ($SD = .6$) ($t(328) = -14.79, p < .0001$), by .3 ($SD = .5$) among the No Change Group ($t(81) = -4.81, p < .0001$), and by .3 ($SD = .6$), among the Worsened Change Group ($t(184) = -6.94, p < .0001$). Mean reductions in concerns varied by attitude change group ($F(2, 593) = 4.902, p = .008$). The Improved Change Group

Table 2. Change Scores in Knowledge, Modified OOAS Subscales, and Risk Compensation Beliefs within and Between Attitude Change Groups.

	Overall (N = 608)			Worsened Attitudes (n = 184)			No Change (n = 81)			Improved Attitudes (n = 330)		
	Pre-Mean (SD)	Post-Mean (SD)	Change Score (SD)	Pre-Mean (SD)	Post-Mean (SD)	Change Score (SD)	Pre-Mean (SD)	Post-Mean (SD)	Change Score (SD)	Pre-Mean (SD)	Post-Mean (SD)	Change Score (SD)
Knowledge	13.0 (3.1)	17.1 (2.0)	4.1 (3.2)*	13.2 (3.1)	17.3 (1.7)	4.2 (3.2)*	13.0 (2.7)	17.1 (1.9)	4.1 (2.9)*	12.9 (3.1)	17.1 (2.0)	4.1 (3.2)*
Competence	3.1 (.7)	4.2 (.5)	1.0 (.7)*	3.1 (.8)	4.1 (.5)	1.0 (.8)*	3.3 (.6)	4.2 (.5)	0.9 (.6)*	3.1 (.7)	4.2 (.5)	1.1 (.7)*
Concerns	2.4 (.6)	2.0 (.6)	-0.4 (.6)*	2.4 (.6)	2.1 (.6)	-0.3 (.6)* ^A	2.3 (.6)	2.0 (.6)	-0.3 (.5)* ^A	2.4 (.6)	1.9 (.5)	-0.5 (.6)* ^B
RiskCompensation	3.1 (.9)	2.8 (.9)	-0.3 (.7)*	3.2 (.9)	3.1 (.9)	-0.1 (.6) ^C	2.9 (1.0)	2.8 (1.0)	-0.1 (.6) ^C	3.0(.8)	2.6 (.9)	-0.5 (.7)* ^B

* Indicates a significant difference between the corresponding pre-training and post-training pair at $p < .0001$;

^A and ^B have a significant difference between groups at $p < .05$

^C and ^D have a significant difference between groups at $p < .0001$

had larger reductions in concerns relative to the No Change and Worsened Change Groups.

Naloxone-related risk compensation beliefs

Endorsement of risk compensation beliefs among the No Change and Worsened Change Groups did not change from the training ($M[SD] = -.1[.6]$, $t(81) = -1.73$, $p = .088$; $M[SD] = -.1[.6]$, $t(183) = -1.79$, $p = .075$, respectively). However, risk compensations beliefs were reduced among the Improved Change Group ($M[SD] = -.5[.7]$, $t(327) = -12.42$, $p < .0001$). Risk compensation belief reductions varied by attitude change group ($F(2, 591) = 24.527$, $p < .0001$), with the Improved Change Group evidencing larger reductions in risk compensation beliefs relative to the No Change Group and Worsened Change Group.

Discussion

In this study, we aimed to assess the effectiveness of a comprehensive, 3-hour training for LEOs on opioid use disorder, harm reduction, and overdose recognition and response. On average, training attendance resulted in improvements across each domain: more favorable attitudes toward overdose victims, less endorsement of naloxone-related risk compensation beliefs, decreased concerns about naloxone use, as well as increased knowledge of and competence in using naloxone. Though participants' attitudes toward overdose victims improved overall, one-third of trainees reported *more negative* attitudes toward overdose victims by the end of our training than they did at the beginning, i.e., they were more likely to believe overdose victims "deserve life-threatening consequences for their actions", "need to be arrested", etc. Officers whose attitudes became more negative were more likely to be younger than their counterparts whose attitudes improved or did not change.

Previous studies analyzing the effects of OEND trainings that were focused only on overdose recognition and response did not find a change in overall

attitudes toward PWUD and overdose victims (3–6), while one study of rural EMTs found a negative effect, which led the authors to suggest expanded training similar to what we implemented (6). Given these previous findings, it is possible that our expanded training with a focus on addiction and harm reduction education contributed to these negative changes in attitudes.

LEOs whose attitudes toward overdose victims became more negative did still benefit from the training, exhibiting improved knowledge and competence in responding to an overdose, specifically. This finding is promising and suggests knowledge gains are likely one of the most consistent and dependable outcomes to expect from OEND training programs. Moreover, in contrast to the lack of improvement in "concerns about naloxone and overdose responding" reported in Wagner et al (5), we *did* find an overall reduction in these same concerns, with the largest reductions demonstrated by those whose attitudes toward overdose victims improved.

The decision to include robust content on the drivers of addiction and the core principles and rationale of harm reduction, in addition to basic overdose and response information covered in typical (and briefer) OEND trainings, was made specifically to improve participants' attitudes toward people who use drugs and overdose. However, our results across these measured domains suggest that although OEND trainings can successfully improve knowledge, competency, and attitudes toward overdose victims *overall*, these improvements are not necessarily happening together within a given participant. In short, it is possible that OEND trainings can improve someone's overdose knowledge and competency while simultaneously *negatively* impacting their attitudes – or stigma – toward overdose victims.

Why do some trainees' attitudes get worse?

Though we did not expect to universally improve LEO's attitudes toward overdose victims and PWUD

through a single training, we did not anticipate making some participants' attitudes *worse*. We can speculate that some participants had minimal knowledge about addiction and corresponding harm reduction approaches, and increasing their knowledge on these topics effectively made them realize how much they disagree with the core principles we were promoting (e.g., meeting people "where they are at," demonstrating compassion versus punishment for PWUD). Indeed, one previous study found that improving knowledge can inadvertently worsen attitudes toward overdose victims among rural EMTs (6). Our study extends this finding beyond rural EMTs to urban and suburban LEOs.

Notably, the group of LEOs growing more negative in their attitudes toward overdose victims was more likely to be younger than those who demonstrated no change or improved attitudes, reported higher beliefs in naloxone-related risk compensation, and had the most negative attitudes toward overdose victims overall. The association with younger age may be related to a colloquial concept known as the "Blue Flame" – a social phenomenon in which police recruits or "rookies" reportedly display higher levels of bravado, toughness, and enthusiasm for patrolling and catching "criminals" than their older, more veteran counterparts (27,28). The concept of the Blue Flame is consistent with findings from Cepeda and colleagues (29) showing officers of older age were less likely than younger officers to confiscate syringes from PWUD, and Page et al.'s (30) finding that officers with more experience with rape investigations were less likely to accept rape myths. More research is needed to better understand those whose attitudes toward overdose victims and PWUD worsen as a result of training designed to have the opposite effect. Perhaps prior exposure to harm reduction training or messaging plays a role, or certain aspects of the content presented or nature of the survey questions served to 'trigger' negative perceptions.

Importantly, stigma toward PWUD is a broad problem that is not unique to law enforcement. Studies of the general population find people often view those with addiction negatively, more negatively than those with mental illness (e.g. (31)). When borrowing from the literature on mental illness stigma, trainings to reduce stigma seem to be only marginally effective (32). Specifically, short-term positive impacts tend to fade away long term, different target groups (e.g., students) respond differently than others, and the area itself is generally

understudied, with sizable gaps in knowledge and representation. The most successful stigma-reducing efforts include direct social contact with people with lived experience (33), as well as those emphasizing skill-building (34). This suggests future trainings aimed at shifting attitudes may be most effective when including people who have survived overdose events, as well as when ample time is provided for role-play and skill practice among participants. Going forward, researchers should apply qualitative techniques to identify the critical mechanisms at play in both the development and reduction of stigma toward drug users, the tangible, behavioral effects of these negative attitudes, and work to tailor attitudinal interventions accordingly.

Limitations

Although these findings provide a novel addition to the study of overdose education training outcomes, some limitations should be noted. First, our LEO sample was composed of predominantly White men in an urban area of the Midwest region of the United States, limiting generalizability to LEO populations with different demographic characteristics or from other regions of the country. Second, we cannot discount the role of trainer effects. All participants who completed the survey were trained by the same group of trainers, but the trainers were not measured or compared to standards of training delivery. Moreover, the manner in which they delivered the content might have elicited reactions we would not have seen if other individuals had conducted the training. Studies on trainer effects suggest that the tone, tenor, and types of emphasis from a given individual trainer can have significant effects on what trainees learn, even when a standardized curriculum is used (35). Third, our choice to teach about addiction through the lens of a brain disease model (36) may have impacted the degree and nature of resulting attitudinal change, as the brain disease model may lend itself to more or less judgment (than other models) toward PWUD. Specifically, scholars have argued that the reliance on the brain disease model prevents us from seeing PWUD as people with agency and choice who use drugs for valid reasons (37). Indeed, biological explanations for behavioral health disorders have been associated with skepticism about the effectiveness of treatment and possibility of recovery (38) which may entrench stigmatizing beliefs that, for example, someone who experienced overdosed is a "lost cause." Last, research remains lacking on the functional impact of LEO attitudes on their response to

an opioid overdose. Outside of the research conducted by Pollini and colleagues (39) on first responder attitudes and the impact of distributing treatment resource information post-overdose, we do not have concrete evidence of the importance of officers having less stigmatizing views toward PWUD. Perhaps officers who hold more stigma toward overdose victims and PWUD respond more slowly (consciously or unconsciously) to the scene – as in, they may drive at slower speeds, or choose to walk instead of run to the victim after exiting their vehicle, or exhibit undue hesitation to perceived risks (e.g., air-borne fentanyl exposure, which does not realistically cause an overdose (40)). We are not aware of any research on this to-date. Generally, we know stigma toward PWUD can be damaging and counterproductive across healthcare settings (41,42) but we lack the needed tangible, behavioral evidence on the negative impacts of stigma among LEO and other emergency response professions as it relates to opioid overdose events specifically.

Conclusion

Our expanded, comprehensive OEND training focused on addiction and harm reduction was developed and implemented in the context of an urgent public health emergency, and therefore reflects a more ‘real-world’ approach to training than could be accomplished in a carefully controlled study. As such, the unexpected response of nearly one-third of trained LEOs, who reported worse attitudes following our training, should be interpreted in that context. Nonetheless, given the ongoing urgency of the overdose crisis, our findings suggest that other public health program designers whose resources are limited should consider the possibility of unexpected negative responses to an expansion in training scope. Future research randomizing LEOs to a standard, focused training or our expanded one would further elucidate the nature of this unexpected response, including the characteristics of trainings and individuals most likely to respond positively or negatively. Such additional information could support public health officials to develop OEND trainings for LEO that most effectively increase knowledge *and* change attitudes toward PWUD and overdose victims. Alternatively, when these findings are taken together with those recently showing increased frequency of overdose responding among LEOs is associated with *worse* attitudes toward PWUD (8), perhaps instead of mandating officers do more training to change ingrained attitudes, program developers should consider investing more efforts and resources into ensuring non-police responders can quickly arrive to overdose scenes to facilitate life-saving and compassionate care.

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Appendix A.

Opioid Overdose Knowledge Scale (OOKS) Items:

- (1) Which of the following are signs of a heroin/opioid overdose? (check all that apply and do not include symptoms displayed after an overdose is reversed)
- (2) What is naloxone used for? (check all that apply)
- (3) How long does naloxone take to start having an effect?
- (4) How long do the effects of naloxone last?
- (5) If the first dose of naloxone has no effect, a second dose can be given.
- (6) There is no need to call for an ambulance if I have naloxone.*
- (7) Someone can overdose again even after having received naloxone.
- (8) The effect of naloxone is shorter than the effect of heroin or methadone.
- (9) Within the first few hours of naloxone administration, the person should not use more opioids/heroin, but it will not hurt them to drink alcohol or take sleeping tablets.*
- (10) Naloxone can provoke withdrawal symptoms.

Opioid Overdose Attitudes Scale (OOAS) Competence Subscale Items:

- (1) I already have enough information about how to manage an opioid/heroin overdose
- (2) I am already able to give naloxone to someone who has overdosed
- (3) I would be able to check that someone who has overdosed was breathing properly
- (4) I am going to need more training before I would feel confident to help someone who has*
- (5) I would be able to perform CPR on someone who has just overdosed
- (6) If I were called to the scene of an overdose, I would know what to do to help them
- (7) I would be able to place someone who has overdose in the recovery position
- (8) I would be able to recognize the signs that someone is having an opioid/heroin overdose
- (9) I know very little about how to help someone who has overdosed*
- (10) I would be able to deal effectively with an overdose

Opioid Overdose Attitudes Scale (OOAS) Concerns Subscale Items:

- (1) I would be afraid of giving naloxone in case the person becomes aggressive afterward.

- (2) I would be afraid of doing something wrong in an overdose situation.
- (3) I would be reluctant to use naloxone for fear of precipitating withdrawal symptoms.
- (4) If I tried to help someone who has overdosed, I might accidentally hurt them.
- (5) I would feel more able to do my job if I had naloxone.*
- (6) I would be afraid to use naloxone for fear of being exposed to professional liability.

Opioid Overdose Attitudes Scale (OOAS) Attitudes Toward Overdose Victims Subscale Items:

- (1) People who overdose need to learn a lesson from it so they will not do it again
- (2) People who overdose are to blame for their own overdose
- (3) It should not be the job of law enforcement officers to respond to drug overdoses
- (4) People who overdose need to be arrested
- (5) People who are arrested after an overdose will be motivated to stop using drugs

- (6) People who overdose deserve life-threatening outcomes as a natural consequence of their actions

Naloxone-related Risk Compensation Beliefs (NaRRC-B Scale) Items:

- (1) Opioid/heroin users will use more opioids/heroin if they know they have access to naloxone.
- (2) Opioid/heroin users will be less likely to seek out treatment if they have access to naloxone.
- (3) Providing naloxone to overdose victims sends the message that I am condoning opioid misuse.
- (4) There should be a limit on the number of times one person receives naloxone to reverse an overdose (refers to multiple overdose events, do not count repeated dose administrations during one overdose event).
- (5) Naloxone is enabling for drug users (i.e., it enables them to continue or increase drug use when they otherwise might not).

*Indicates a reverse-scored item