Use of Project ECHO to Promote Evidence Based Care for Justice Involved Adults with Opioid Use Disorder

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Abstract

Background.—People with opioid use disorders (OUDs) are at heightened risk for involvement with the criminal justice system. Growing evidence supports the safety and effectiveness of providing empirically supported treatments for OUD, such as medications for OUD (M-OUD), to people with criminal justice involvement including during incarceration or upon re-entry into the community. However, several barriers limit availability and accessibility of these treatment options for people with OUDs, including a shortage of healthcare and justice professionals trained in how to implement them. This study evaluated a novel education program, the Indiana Jail OUD Treatment ECHO, designed to disseminate specialty knowledge and improve attitudes about providing M-OUD in justice settings.

Methods.—Through didactic presentations and case-based learning (10 bimonthly, 90-min sessions), a multidisciplinary panel of specialists interacted with a diverse group of community-based participants from healthcare, criminal justice, law enforcement, and related fields. Participants completed standardized surveys about OUD knowledge and attitudes about delivering M-OUD in correctional settings. Thematic analysis of case presentations was conducted.

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Results.—Among 43 participants with pre- and post-series evaluation data, knowledge about OUD increased and treatment was viewed as more practical after the ECHO series compared to before. Cases presented during the program typically involved complicated medical and psychiatric comorbidities, and recommendations addressed several themes including harm reduction, post-release supports, and integration of M-OUD and non-pharmacological interventions.

Conclusions.—Evaluation of future iterations of this innovative program should address attendance and provider behavior change as well as patient and community outcomes associated with ECHO participation.

Keywords

opioid use disorder; criminal justice; Project ECHO; continuing medical education; medication assisted treatment (MAT); medication for opioid use disorder (M-OUD)

Introduction

The opioid crisis in the United States – where approximately 2 million adults have symptoms of opioid use disorder (OUD)[1] has presented a challenge for health systems and government agencies to provide evidence-based care to people who use opioids[2,3]. Individuals using opioids are more likely to become involved with the criminal justice system,[4] and 16.6% of state prisoners and 18.9% of sentenced jail inmates report regular use of heroin or other opioids[5]. There is increased risk for fatal opioid overdose following release from correctional facilities[6]; overdose is the leading cause of death following release from incarceration[7]. Access to opioid treatment within the justice system is therefore a critical public health issue[4]. Nevertheless, access to effective treatments remains limited. Only about 1 in 4 adult patients with OUD receive medications for OUD (M-OUD), the most effective treatment for OUD[3]. This rate is even lower within correctional settings[8,9] despite mounting evidence that M-OUD can be delivered safely and effectively in that context[10].

Significant attitudinal, institutional, programmatic, and systemic barriers – including limited knowledge about and clinical capacity for prescribing and administering M-OUD – exist that prevent justice-involved individuals from receiving high quality OUD care.[9] Trainings designed to increase knowledge about M-OUD have been identified as one of only a few facilitators of M-OUD implementation in justice settings[9]. Hence, providing staff within the justice system with training on M-OUD may be a critical step to improving the availability, accessibility, and effectiveness of OUD treatment in these settings. Public health frameworks suggest that the effective implementation of opioid treatment for justice-involved individuals occurs when all actors within the system (e.g., law enforcement officers, judges, probation officers) collaborate to connect justice-involved individuals with appropriate care[11]. Thus, the potential value of multidisciplinary education programs that involve professionals from varied criminal justice and healthcare roles is clear.

One model for enhancing system capacity to address OUD is Project ECHO (Extension of Community Healthcare Outcomes). Project ECHO was designed to aid community-

based practitioners in addressing common and complex health conditions[12]. It utilizes a virtual, hub-and-spoke model of training, in which academic medical centers operate as "hubs," providing mentorship and sharing expertise with community-based practitioners, or "spokes" who share valuable insights into current practices and local innovations[13]. While the frequency, duration and target participant populations of these programs vary, ECHO clinic session agendas typically follow a standardized format involving brief didactic presentations on relevant topics and case-based learning in which participants are encouraged to learn through the co-management of de-identified patient cases with specialists and other community-based providers[12]. The ECHO model has proven to be an effective strategy for increasing health provider knowledge and improving patient outcomes across a range of disorders[14], though gaps remain in the field's understanding of how and under what circumstances ECHO programs can have positive impacts on provider- and patient-level outcomes and overall population health[15].

Dozens of ECHO programs nationwide have provided continuing education on substance use disorders – and OUD specifically – to hundreds of community-based providers who did not have specialized training or credentials in addiction treatment, allowing for the rapid incorporation of evidence-supported clinical best practices in settings where patients already receive care[13]. A statewide OUD ECHO program in Indiana (U.S.), launched in 2018, likewise identified widespread need for and interest in collaborative learning about OUD and M-OUD[16]. Recent systematic reviews of OUD-focused ECHO programs have highlighted the promise of such efforts in increasing the accessibility and quality of clinical services for patients with OUD, with most studies reporting on ECHO participants' generally high levels of satisfaction with the ECHO model and increased self-reported knowledge and competence in managing OUD based on pre-/post-session or -series evaluations[17,18].

Although the ECHO model has been used to promote safe and effective use of M-OUD in community settings, the focus has typically been on implementation with a general community patient population and not on justice-involved patients. Given the exceptionally high risk for both OUD and overdose in this population, along with the myriad special considerations for delivering care before, during, and after incarceration, a need was identified for an ECHO series specifically focused on jail- and corrections-based management of OUD. Hence, in 2019, a new Jail-Based OUD Treatment[1] ECHO was developed and implemented through the existing Indiana OUD ECHO program. The goals of the program were to promote clinical competence in treating OUD among justice-involved adults, specifically focused on providing M-OUD and continuity of care upon release, as well as to increase knowledge and decrease stigma around OUD and M-OUD.

The purpose of this study was to describe the content and implementation of this innovative program, as well as initial findings regarding its impact on participants' knowledge and attitudes about OUD and M-OUD.

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[1]The program was developed, launched, and marketed as the Jail MAT ECHO, in reference to medication assisted treatment. Current iterations of the program use the more up-to-date and accurate term, M-OUD, in reference to medications for OUD or to OUD Treatment more generally.

Methods

Design

This study was a secondary analysis of a deidentified dataset collected as part of the quality improvement evaluation of the Indiana Jail OUD Treatment ECHO – a highly novel program focused specifically on management of OUD for people in jails and correctional settings. The evaluation protocol was structured to function as a cohort study, with a pretest and a posttest. Use of these data for this secondary analysis was approved by the Indiana University Institutional Review Board.

Setting and Participants

The Indiana Jail-Based OUD Treatment ECHO series was a 10-session program that met virtually (using Zoom software) twice each month for five months, beginning February 13 and ending June 18, 2020. An interdisciplinary expert hub team panel was assembled that included a psychiatrist, a psychiatric clinical pharmacist, a licensed mental health and clinical addictions counselor, a judge, attorneys, a peer recovery expert, a community corrections director, and a sheriff. Guest presenters included representatives from state government agencies and from national model programs in corrections-based delivery of M-OUD. Didactic topics are outlined in Table 1; slide decks are freely available online at https://oudecho.iu.edu/tracks/jail/). Didactic presentations relating to OUD generally (e.g., overview, M-OUD, behavioral health interventions) were adapted from materials available through the ECHO Institute at University of New Mexico. Additional topics were included based on formative discussions with the hub team and state officials. De-identified case discussions, described further below, followed each didactic presentation. Sessions were recorded for quality assurance and could be made available to participants upon request; however, no requests were received for recorded sessions during this series.

Participants were recruited through a variety of methods, including promotional emails circulated to relevant professional groups and associations, word-of-mouth advertising at existing OUD-related continuing education programs, and sign-ups at exhibit booths at state and local conferences. Participants received free continuing medical education or continuing education (CME/CE) credits for each session attended. Registration was free and open to all interested parties, there were no explicit attendance requirements, and participants could join as many or as few sessions as they were able and interested to attend. A total of 183 individuals registered for the Indiana Jail-Based OUD Treatment ECHO program ("full sample"), and 150 (82%) individuals attended at least 1 session. Session attendance, measured based on number of participants who signed into each virtual session, ranged from 39 (Session 10) to 85 (Session 1), with an average of 57.6 participants per session (SD = 12.6; see Table 1). Among the full sample, participants attended an average of 3.7 sessions during the series (SD = 3.0); 38% attended only one session, 37% attended five or more sessions, and 5.3% attended all 10 sessions. Rates of attendance were similar to other OUD-focused ECHO programs that have been described in the literature. For instance, 62% of our participants attended more than 1 session. Komaromy and colleagues reported 285 (44%) of 654 unique participants attended more than 1 session in their ECHO programs focused on OUD[13].

Pretest data were collected during the program registration process; participants were not required to answer any pretest questions other than name and contact information. Posttest data were solicited after the ninth session, with the cutoff date for analysis set 11 days after the final session. Participants were reminded to complete the posttest both during ECHO sessions and through e-mail reminders. Posttest responses were incentivized with a $10 US digital gift card on completion. Pretest and posttest data were matched using participant identifiers, and blank or duplicate entries were removed. No "exposure" cutoff (e.g., session attendance) was used for individuals who completed the posttest, consistent with the intention-to-treat principle from randomized trials[19]. Similarly, since this was an evaluation study, no *a priori* study size was specified, and all pretest and posttest data were included.

Variables

The following variables were collected for descriptive purposes: *current profession*, *work (in any capacity) as part of a jail system*, and *years of active professional practice in current profession*.

Punishment/deterrence orientation was measured using a scale from the National Criminal Justice Treatment Practices (NCJTP) survey and reflected the degree to which respondents supported punitive policies and practices for people with OUD[20]; complete case pretest α=.874, posttest α=.880. *Rehabilitation orientation* was measured using an NCJTP survey scale and reflected the degree to which respondents supported more therapeutic and rehabilitation focused policies and practices for people with OUD[20]; complete case pretest α=.865, posttest α=.831. *Treatment perception* was measured via twelve NCJTP survey variables that queried respondents' agreement with statements related to the appropriateness, goals, and goals of SUD treatment, particularly for people with justice system involvement[20]. Items were presented as statements with Likert type response options (Strongly Disagree, Disagree, Neither Agree Nor Disagree, Agree, Strongly Agree). Responses were coded such that 1=most optimal and 5=least optimal from a public health perspective (lower scores = less punishment oriented, more rehabilitation orientation). For NCJTP survey scales, scores represent averages across items. *Objective knowledge about OUD*, computed as a percentage score from eight multiple choice questions graded as correct/incorrect, measured knowledge and understanding of basic facts about OUD and M-OUD.

Statistical Approaches

Analyses—Raw descriptive data and number of respondents were reported for pretest and posttest. For punishment, rehabilitation, and objective knowledge about OUD, pre- and posttest comparison was performed with paired *t*-tests. For the individual treatment perception items, since most variables were not normally distributed and responses were ordinal, comparison was done using paired Wilcoxon tests. Statistical significance of treatment perception items was interpreted in consideration of the possibility of inflated type I error from multiple familywise comparisons[21]. All analyses were two-tailed.

Missing Data and Attrition—Participants were included in the comparison analyses if they both (a) answered at least one evaluation question at pretest and (b) answered at least one evaluation question at posttest. This study did not prespecify an approach to missing data, except for objective knowledge (where failure to complete an item was computed as an incorrect response as long as some items had been completed). Missingness in the comparison subsample for punishment, rehabilitation, and treatment perception was minimal (ranging from 0% to 4.7% by variable) and primarily resulted from early survey termination, so cases were excluded pairwise by analysis.

To assess potential bias from attrition (e.g., systematic differences between those who completed the pretest only from those who completed both pretest and posttest), a series of uncorrected Mann-Whitney U tests were performed on all study outcome variables at pretest, treating "pretest only" and "pretest + posttest" as two independent groups. No comparisons were significant even at an uncorrected alpha level, so we proceeded under the assumption that bias introduced by attrition was minimal.

Case Discussion Themes—The ECHO model involves case-based learning in the form of de-identified patient cases presented by a community participant or hub team panelist and then discussed through a facilitated conversation where clarifying questions and recommendations are solicited from the group. Participants are invited and encouraged to submit cases throughout the series by completing and submitting a structured case form to program staff, who then review it to ensure no protected health information (PHI) is included. During each ECHO session, the case discussions are led by the session facilitator (i.e., a designated member of the hub team), who follows a standardized protocol as outlined by the ECHO Institute. First, the case presenter shares details and key questions about the case with the group. Next, clarifying questions are asked – first by other community participants, then by the hub team specialists. Finally, recommendations are shared to address the presenter's questions based on best practice guidelines and available resources – again, first from community participants, followed by the hub team.

These case discussions are thought to be an important learning mechanism through which participants can consider how best practice principles may be applied to complex, real-world cases. Whereas the topics for the didactic presentations were predetermined, the content of the case discussions was not. That is, the topics or themes or questions raised in the cases were not required to correspond directly to the didactic sessions presented the same week, though often times the points addressed reinforced topics addressed in previous sessions. Consistent with a general inductive approach[22], case presentation forms were reviewed by two raters to identify topics that were addressed over the course of this series related to patient characteristics and questions raised by case presenters. This thematic analysis[23] involved detailed review of text-based case presentation and case recommendation forms to identify themes and categories for patient characteristics, questions raised by the case presenters, and recommendations made by panelists and participants over the course of this series. The rates reviewed the forms separately, then conferred to verify consensus about primary themes.

Results

Participants and Descriptive Data

Of the full sample of people who registered for the program (n=183), 43 participants attended at least one session, completed at least part of the pretest, and completed at least part of the posttest ("analytic sample"). Registration numbers often overrepresent attendance in series such as this, as many people who initially register are unable to attend due to scheduling conflicts or other barriers. Descriptive data at pretest are provided in Table 2 for both (a) the full sample, and (b) the analytic sample.

Participants represented a variety of different roles and professions, with approximately one third working with a jail in some capacity (e.g., employee, volunteer), and a majority of respondents reporting professional work in healthcare or an "other" field, such as a state agency. The average years of practice among all registrants was 12.4 (SD=10.7), and among the analytic sample was 15.0 (SD=13.4). The mean score on the objective knowledge assessment at pretest was 54% (SD=17%), with a fairly normal distribution of scores.

Pretest scores for most analytic variables approached the ceiling of 1 (most optimal). The full sample reported near-optimal mean rehabilitation orientation (1.35, SD=0.46), as did the analytic sample (1.23, SD=0.32). The same was true to a slightly lesser degree for punishment orientation for the full sample (1.88, SD=0.71) and the analytic sample (1.80, SD=0.62). For the individual items regarding jail-based treatment, no scores were worse than 2.71, and most were considerably more optimal (Table 2).

Analytic Outcomes

Although few differences were observed between pretest and posttest for the analytic sample, two specific variables appeared to have improved with a clinically meaningful magnitude (though the alpha levels were lower than a standard 0.05, they were higher than a conservative Bonferroni-corrected alpha). Mean objective knowledge increased by 8.4% (*95% CI*: 1.8% to 15.0%, t=−2.58, p=0.013), which corresponds to just under 1 additional correct answer at post-test. Median scores improved from 50% to 62.5%, which is equivalent to getting one additional item correct at post-test. In addition, participants were less likely at posttest to agree that it is impractical for treatment programs to provide tailored services (mean improvement 0.36, 15 cases improved, 5 worsened, 20 did not change; z=−2.42, p=0.016). All outcomes are reported in Table 3.

Case Presentation Content and Themes

Several themes associated with patient characteristics were observed, including use of multiple illicit substances in addition to opioids, high rates of medical and psychiatric comorbidity, prior history of mental health treatment, family history of substance use, and early age of first substance use. Case presenters often posed questions regarding how best to provide support for a harm reduction approach, steps to determine the most appropriate form and dose of M-OUD, and resources for appropriate community-based aftercare and housing options that support the use of M-OUD. A review of the recommendations shared with case presenters also revealed several themes. Recommendations commonly addressed

treatment and harm reduction precautions for clients upon release from carceral settings, such as providing a supply of naloxone, connecting individuals with recovery services prior to release (e.g., recovery coaches, social support services), identifying community-based housing and aftercare for individuals engaged in buprenorphine treatment, reducing stigma by providing appropriate addiction recovery education to probation/parole agents and judges, and best practice behavioral health treatments to complement M-OUD.

Conclusions

There is continued need for greater awareness among healthcare and justice professionals of evidence-based strategies for managing OUD among justice-involved individuals – especially during the reentry period – given the possible severe negative consequences including death[6,7]. The Indiana Jail-Based OUD Treatment ECHO program was a highly novel continuing education program that sought to promote clinical competence in treating OUD among justice-involved adults, specifically with regard to providing M-OUD and continuity of care upon release.

It was anticipated that engagement in the Jail-Based OUD Treatment ECHO would increase knowledge of and decrease stigma around OUD and M-OUD. Although there was room for improvement on some items, for most outcomes, there was a ceiling effect[24], which was especially pronounced in certain content domains, such as endorsement of attitudes related to rehabilitation. On average, Jail-Based OUD Treatment ECHO participants expressed beliefs consistent with a rehabilitation orientation rather than a punishment orientation at baseline; as a result, for several items, it was not feasible to measure improvement. It may not be surprising that participants endorsed rehabilitative views since enrollment was open to all and participants self-selected into the program. Encouragingly, these strong rehabilitation-oriented attitudes were observed even with approximately 50% of the participants being from fields outside of healthcare, such as law enforcement and corrections (jail personnel, probation officers).

Knowledge, measured by a percentage score on objective multiple-choice questions, increased significantly and meaningfully, suggesting the program as implemented was effective in supporting a moderate increase in general OUD knowledge. Further, participants endorsed perceiving the provision of individualized services as more practical after the ECHO series compared to before. This is notable given there was no "dose" requirement for inclusion in the analysis sample, and 38% of participants attended a single session and 63% attended fewer than half the sessions offered. More rigorous evaluation of potential dose-response effects is needed to determine the minimum or optimal amount of exposure needed to yield positive effects as well as how such effects may be moderated by participant characteristics (e.g., role, baseline attitudes, etc.). Most of the didactic curriculum addressed legal considerations, implementation challenges, and other justice-/corrections-specific content pertaining to management of OUD, which may have been beneficial to changing participant beliefs about their ability to tailor treatment in jail-based setting. Further, case presentations for this program all focused on clinical management of OUD among justice-involved patients, which likely reinforced knowledge gains and illustrated how evidence-based principles can be applied in real-world, complex situations.

This approach may have challenged misconceptions about OUD and treatment for OUD that otherwise would have prevented participants from attempting to provide M-OUD and other evidence-based services for justice-involved people with OUD. Future work should aim to replicate this finding and confirm the effect observed here was meaningful and not spurious.

The presented cases strongly emphasized harm reduction, as well as housing and other supports needed to allow people with OUD to engage in and maintain involvement in treatment post-release from correctional settings. Further, patient characteristics often included complex presentations that included co-occurring mental health diagnoses, polysubstance use, and complex histories of use. Together, these trends support ongoing inclusion of a diverse, multidisciplinary panel of specialists who can address not only the clinical management of OUD but also the wide array of social, legal, medical, and psychiatric factors that may contribute to OUD treatment success and recovery for patients involved in the justice system through re-entry, probation and parole[11]. Moreover, the nature of the cases presented in this series suggests congruence between the programming offered in this initial Jail-based OUD Treatment ECHO series and participant needs. Future iterations may include even greater attention to psychiatric comorbidities, whether through didactic presentations or other resources, similar to needs identified in our team's general OUD ECHO[16].

There are several implications for future iterations of educational programs like ECHO. First, to maximize impact, such programs should consider targeted or incentivized recruitment of individuals who would not ordinarily self-select into a voluntary program and are less likely to endorse rehabilitative attitudes for people with OUD in corrections at baseline. ECHO programming may be effective for those professionals who are ambivalent, uncertain, or perhaps even resistant to the notion of implementing M-OUD and other supported interventions in correctional contexts, but this study can neither offer evidence in support of or in opposition to that assertion. It stands to reason, though, that changes in knowledge and attitudes about OUD would be more pronounced or observable over the course of an ECHO program in this population. Incentives from employers, credentialing bodies, or other external systems or stakeholders and attending to key system- and organizational- implementation factors related to both M-OUD delivery and engagement in ECHO may bolster participation among a broader audience[25].

Evaluation plans for programs like ECHO might benefit from shifting away from attitudes about OUD treatment and more toward behavioral intentions and actual practice change for specific desired actions such as increased prescribing M-OUD or establishing an outpatient treatment contact/appointment prior to re-entry and, eventually, patient and community health outcomes[26]. The need for rigorous evaluation on patient and community health outcomes has been emphasized in recent reviews of ECHO programs generally and OUD-focused ECHO programs specifically[15,17,18]. This approach may be especially important when participants are already strongly motivated to implement best practice OUD intervention strategies in their work. If questions about attitudes are retained – given the findings from this study –evaluative scales could be modified to increase the number of response options (e.g., moving from 5 to 9) to capture more nuanced and granular improvement[24].

There were several limitations to this study. The participating subjects were recruited via convenience sampling with clear bias toward favorability of jail-based treatment as indicated in the pretest data. This is a common aspect of ECHO programs in general, which seek to disseminate specialized knowledge to providers who are motivated to learn new strategies for caring for patients in their communities. Given that this population is most likely to self-select into an ECHO, the results are still of interest for those delivering voluntary educational programming such as this. Nevertheless, participants in the current study endorsed optimal levels of punishment orientation/rehabilitation orientation, with little variability among participants. The lack of statistically significant improvement in measured outcomes among these self-selected participants does not speak to the actual efficacy (or lack thereof) of the program as designed. To better evaluate the potential impact of similar programs, participant samples spanning a broader range of baseline knowledge and attitudes – especially at the lower end of the spectrum – should be recruited. These efforts may also result in greater capacity to examine possible differences in knowledge, attitudes, engagement, and other relevant factors between participants from different training backgrounds and roles Another limitation is that observed improvements cannot be directly attributed to the ECHO itself, as other external factors may have also influenced interval improvements. Indeed, this ECHO series was offered as one element of the state's multi-pronged initiative aimed at preventing and reducing OUD and related morbidity and mortality, including in correctional and healthcare settings. Additionally, although we transparently indicated the potential implications of multiple familywise comparisons, there was a risk of increased Type I error, though the measured changes corresponded with theoretically reasonable outcomes. Finally, although the knowledge questions were carefully designed and revised, they have not been formally validated or vetted in comparison to other questions that may be asked. Future studies may incorporate additional questions about a broader set of topics including available resources and services for people with OUD, regulatory considerations pertaining to implementation of M-OUD in correctional settings, and role-specific content given that several participants may be non-clinicians.

This was the first evaluation of a jail-based OUD ECHO program reported in the literature. Despite the aforementioned limitations, findings from this highly novel program underscore the need for research to identify outcomes beyond participant knowledge and attitude change, including improvements in provider behavior (e.g., competent implementation of best practice treatments), patient health, and community health. Future work should also examine the effectiveness of ECHO and similar programs among participants who may be more ambivalent or resistant to implementing M-OUD and other evidence-based strategies initially to see whether programming is effective in promoting knowledge gain and attitude change among those professionals.

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References

1. Han B, Compton WM, Blanco C, Crane E, Lee J, Jones CM. Prescription opioid use, misuse, and use disorders in US adults: 2015 National Survey on Drug Use and Health. Annals of Internal Medicine. 2017;167(5):293–301. [PubMed: 28761945]

2. Vadivelu N, Kai AM, Kodumudi V, Sramcik J, Kaye AD. The opioid crisis: A comprehensive overview. Current Pain and Headache Reports. 2018;22(3):16. [PubMed: 29476358]

3. Saloner B, McGinty EE, Beletsky L, et al. A public health strategy for the opioid crisis. Public Health Reports. 2018;133(1_suppl):24S–34S. [PubMed: 30426871]

4. Winkelman TNA, Chang VW, Binswanger IA. Health, polysubstance use, and criminal justice involvement among adults with varying levels of opioid use. JAMA Network Open. 2018;1(3):e180558.

5. Bronson J, Stroop J, Zimmer S, Berzofsky M. Drug use, dependence, and abuse among state prisoners and jail inmates, 2007–2009. Washington, DC: United States Department of Justice, Office of Juvenile Justice and Delinquency Prevention. 2017.

6. Binswanger IA, Blatchford PJ, Mueller SR, Stern MF. Mortality after prison release: Opioid overdose and other causes of death, risk factors, and time trends from 1999 to 2009. Annals of Internal Medicine. 2013;159(9):592–600. [PubMed: 24189594]

7. Binswanger IA, Stern MF, Yamashita TE, Mueller SR, Baggett TP, Blatchford PJ. Clinical risk factors for death after release from prison in Washington State: a nested case-control study. Addiction. 2016;111(3):499–510. [PubMed: 26476210]

8. Csete J Criminal justice barriers to treatment of opioid use disorders in the United States: the need for public health advocacy. American Journal of Public Health. 2019;109(3):419–422. [PubMed: 30676805]

9. Grella CE, Ostile E, Scott CK, Dennis M, Carnavale J. A scoping review of barriers and facilitators to implementation of medications for treatment of Opioid Use Disorder within the criminal justice system. International Journal of Drug Policy 2020;81:102768. [PubMed: 32446130]

10. Moore KE, Roberts W, Reid HH, Smith KMZ, Oberleitner LMS, McKee SA. Effectiveness of medication assisted treatment for opioid use in prison and jail settings: A meta-analysis and systematic review. J Subst Abuse Treat. 2019;99:32–43. [PubMed: 30797392]

11. Brinkley-Rubinstein L, Zaller N, Martino S, et al. Criminal justice continuum for opioid users at risk of overdose. Addictive Behaviors. 2018;86:104–110. [PubMed: 29544869]

12. Arora S, Geppert CM, Kalishman S, et al. Academic health center management of chronic diseases through knowledge networks: Project ECHO. Acad Med. 2007;82(2):154–160. [PubMed: 17264693]

13. Komaromy M, Duhigg D, Metcalf A, et al. Project ECHO (Extension for Community Healthcare Outcomes): A new model for educating primary care providers about treatment of substance use disorders. Substance Abuse. 2016;37(1):20–24. [PubMed: 26848803]

14. Zhou C, Crawford A, Serhal E, Kurdyak P, Sockalingam S. The Impact of Project ECHO on Participant and Patient Outcomes. Academic Medicine. 2016;91(10):1439–1461. [PubMed: 27489018]

15. Faherty LJ, Rose AJ, Chappel A, Taplin C, Martineau M, Fischer SH. Assessing and Expanding the Evidence Base for Project ECHO and ECHO-Like Models: Findings of a Technical Expert Panel. J Gen Intern Med. 2020;35(3):899–902. [PubMed: 31925737]

16. Agley J, Adams ZW, Hulvershorn LA. Extension for Community Healthcare Outcomes (ECHO) as a tool for continuing medical education on opioid use disorder and comorbidities. Addiction. 2019;114(3):573–574. [PubMed: 30397977]

17. Holmes CM, Keyser-Marcus L, Dave B, Mishra V. Project ECHO and Opioid Education: a Systematic Review. Current Treatment Options in Psychiatry. 2020;7(1):9–22.

18. Puckett HM, Bossaller JS, Sheets LR. The impact of project ECHO on physician preparedness to treat opioid use disorder: a systematic review. Addict Sci Clin Pract. 2021;16(1):6. [PubMed: 33482906]

19. Gupta SK. Intention-to-treat concept: A review. Perspect Clin Res. 2011;2(3):109–112. [PubMed: 21897887]

20. Taxman FS, Young DW, Fletcher BW. The National Criminal Justice Treatment Practices survey: an overview of the special issue. J Subst Abuse Treat. 2007;32(3):221–223. [PubMed: 17383547]

21. Staffa SJ, Zurakowski D. Strategies in adjusting for multiple comparisons: A primer for pediatric surgeons. J Pediatr Surg. 2020;55(9):1699–1705. [PubMed: 32029234]

22. Thomas DR. A general inductive approach for analyzing qualitative evaluation data. American journal of evaluation. 2006;27(2):237–246.

23. Clarke V, Braun V, Hayfield N. Thematic analysis. Qualitative psychology: A practical guide to research methods. 2015:222–248.

24. Chyung SY, Hutchinson D, Shamsy JA. Evidence-Based Survey Design: Ceiling Effects Associated with Response Scales. Performance Improvement. 2020;59(6):6–13.

25. Serhal E, Arena A, Sockalingam S, Mohri L, Crawford A. Adapting the Consolidated Framework for Implementation Research to Create Organizational Readiness and Implementation Tools for Project ECHO. J Contin Educ Health Prof. 2018;38(2):145–151. [PubMed: 29505486]

26. Stevenson R, Moore DE Jr., Ascent to the Summit of the CME Pyramid. JAMA. 2018;319(6):543–544. [PubMed: 29356817]

Table 1.

Attendance by Session and Cumulative Attendance Rates.

Session Number, Didactic Presentation Topic	Attendance	
1, Overview of OUD as a Brain Disease	85	
2, M-OUD and Transitional Healthcare	58	
3, Stigma Reduction	59	
4, Jail-Based M-OUD Program: Best Practices from the Rhode Island Dept. of Corrections	55	
5, Diversion, Storage & Security Protocols	63	
6, Legal Cases Regarding OUD in Jails	65	
7, Behavioral Health Interventions & Continuity of Care	50	
8, Peer Recovery Coaching	58	
9, Legal Issues Related to OUD	44	
10, Recovery Works, Medicaid, & Housing	39	
Mean (SD)	57.6 (12.6)	
# of Sessions Attended	**n (%)[*]**	**Cumulative %**
10	8 (5.3%)	5.3%
9	7 (4.7%)	10.0%
8	5 (3.3%)	13.3%
7	12 (8.0%)	21.3%
6	11 (7.3%)	28.7%
5	13 (8.7%)	37.3%
4	9 (6.0%)	43.3%
3	7 (4.7%)	48.0%
2	21 (14.0%)	62%
1	57 (38%)	100%
Mean (SD)	3.7 (3.0)	

[*] Values based on percent of participants who attended at least one session (n=150).

Table 2.

Descriptive Data at Pretest

	#	%	#	%
Current Profession	175	-	43	-
Law Enforcement	5	2.9	1	2.3
Jail Personnel	9	4.9	2	4.7
Healthcare Professional [*]	81	46.3	16	37.2
Community Corrections	7	4.0	2	4.7
Probation	6	3.4	4	9.3
Peer Recovery Support	16	9.1	4	9.3
Other [**]	51	29.1	14	32.6
Work in Jail (Any Capacity)	166	-	41	-
Yes	61	36.7	15	36.6
No	105	63.3	26	63.4

	Mean (SD)	# Obs	Mean (SD)	# Obs
Years of Practice	12.4 (10.7)	161	15.0 (13.4)	39
Punishment Orientation [***]	1.88 (0.71)	164	1.80 (0.62)	42
Rehabilitation Orientation [***]	1.35 (0.46)	165	1.23 (0.32)	43
Objective Knowledge [***]	0.54 (0.17)	153	0.54 (0.17)	42
Additional Attitudes [***]				
Offenders have few strengths…	1.96 (1.04)	156	2.05 (1.10)	42
Seriousness of offence should determine Tx	2.55 (1.05)	155	2.69 (1.09)	42
Tx cannot address motivation for change	1.91 (0.90)	156	1.88 (0.80)	42
Prison Tx should link to community Tx	1.39 (0.73)	156	1.21 (0.47)	42
People who use / sell drugs should get same Tx	2.29 (1.04)	156	2.19 (1.02)	42
Community counselors should know about Tx in prison	1.44 (0.67)	156	1.33 (0.48)	42
Complete intensive prison Tx $\rightarrow$ no need for community Tx	1.53 (0.77)	156	1.52 (0.83)	42
Important to have comprehensive individualized assessment for each offender	1.33 (0.58)	156	1.21 (0.42)	42
Not Tx responsibility to motivate behavior change	2.32 (0.95)	155	2.24 (0.88)	42
Impractical for Tx to provide tailored services	1.88 (0.83)	153	2.00 (0.87)	41
Only motivated offenders can be helped	2.71 (1.07)	156	2.48 (1.07)	42
All substance users should have same Tx	1.71 (0.75)	155	1.51 (0.55)	41

[*] E.g. Physician, nurse, community health worker, crisis counselor, social worker

[**] E.g. Government, state agency, public defender

[***] Note: [1: Most Optimal Response; 5: Least Optimal Response] for all variables except Years of Practice and Objective Knowledge

Table 3.

Analytic results ($n = 43$)

Variable*	Pre Mean (SD)	Pre Range	Post Mean (SD)	Post Range	Test Statistic	Sig (p)
Punishment Orientation	1.80 (0.63)	1.00–3.43	1.68 (0.60)	1.00–3.14	1.61	0.116
Rehabilitation Orientation	1.23 (0.32)	1.00–2.25	1.30 (0.42)	1.00–2.75	−1.32	0.194
Objective Knowledge	0.53 (0.19)	0.00–0.88	0.61 (0.20)	0.00–1.00	−2.58	0.013
Additional Attitudes						
Offenders have few strengths…	2.05 (1.10)	1.00–5.00	1.81 (0.77)	1.00–4.00	−1.67	0.095
Seriousness of offence should determine Tx	2.69 (1.09)	1.00–5.00	2.52 (0.99)	1.00–5.00	−0.98	0.326
Tx cannot address motivation for change	1.88 (0.80)	1.00–4.00	1.79 (0.87)	1.00–4.00	−0.62	0.537
Prison Tx should link to community Tx	1.21 (0.47)	1.00–3.00	1.57 (1.13)	1.00–5.00	−1.64	0.101
People who use / sell drugs should get same Tx	2.19 (1.02)	1.00–5.00	2.24 (1.12)	1.00–5.00	−0.38	0.707
Community counselors should know about Tx provided in prison	1.33 (0.48)	1.00–2.00	1.36 (0.62)	1.00–4.00	−0.23	0.819
Complete intensive prison Tx → no need for community Tx	1.52 (0.83)	1.00–5.00	1.55 (0.74)	1.00–5.00	−0.40	0.686
Important to have comprehensive individualized assessment for each offender	1.21 (0.42)	1.00–2.00	1.19 (0.40)	1.00–2.00	−0.45	0.655
Not Tx program's responsibility to motivate behavior change	2.24 (0.88)	1.00–4.00	2.29 (0.89)	1.00–4.00	−0.48	0.635
Impractical for Tx to provide tailored services	2.00 (0.87)	1.00–4.00	1.64 (0.66)	1.00–3.00	−2.42	0.016
Only motivated offenders can be helped	2.48 (1.07)	1.00–5.00	2.40 (0.89)	1.00–5.00	−0.55	0.580
All substance users should have same Tx program	1.51 (0.55)	1.00–3.00	1.64 (0.66)	1.00–4.00	−1.04	0.297

*Note: [1: Most Optimal Response; 5: Least Optimal Response] for all variables except Objective Knowledge