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Babak Tofighi

Noah Isaacs

Hannah Byrnes-Enoch

Rebecca Lakew

Joshua D Lee

See next page for additional authors

Authors

Babak Tofighi, Noah Isaacs, Hannah Byrnes-Enoch, Rebecca Lakew, Joshua D Lee, Carolyn Berry, and Daniel Schatz

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Babak Tofighi, MD, MSc[1,2,3], **Noah Isaacs, MPA**[4], **Hannah Byrnes-Enoch, MPH**[4], **Rebecca Lakew, MPH**[4], **Joshua D. Lee, MD, MSc**[1,2,3], **Carolyn Berry, PhD**[1], **Daniel Schatz, MD, MSc**[1,2,4]

[1.]New York University School of Medicine, Department of Population Health,

[2.]New York University School of Medicine, Division of General Internal Medicine

[3.]Center for Drug Use and HIV Research, NYU College of Global Public Health

[4.]NYC Health+Hospitals

Abstract

Project Extension for Community Healthcare Outcomes (Project ECHO) offers an innovative and low-cost approach to enhancing the management of complex conditions among primary care providers. The NYC Health + Hospitals Buprenorphine ECHO (H+H ECHO) program offers primary care providers (PCPs) training and support in managing opioid use disorder (OUD). This exploratory study assessed the feasibility of a 16-session video conferencing platform led by Addiction Medicine experts in improving addiction knowledge, perceived self-efficacy, and buprenorphine prescribing among PCPs located in 17 publicly-funded ambulatory care clinics. A pre- and post-training survey assessed changes in knowledge and self-efficacy. Buprenorphine prescribing patterns were also captured pre-post training. Training sessions consisted of a review of the agenda by the H+H ECHO hub team, 15–30 minute didactic lectures led by specialists, followed by a patient case presentation. Participants attended an average of 9 lectures (range, 1–15 sessions) and 53% of trainees attended at least 10 of the 16 sessions. Perceived self-efficacy improved post-H+H ECHO (73.2%) versus pre-training survey results (58.1%). There were minimal increases in knowledge post-training (58.4%) versus pre-training (51.4%). Only three additional providers reported prescribing Buprenorphine post-training (n=10) versus pre-training (n=7). Suggestions for improving H+H ECHO included trainings addressing stigma, administrative support, improved referrals to office-based opioid treatment (OBOT), integration of non-physician staff (i.e., case management, social work), and combining multimodal learning strategies (i.e., podcasts, web-based modules) with videoconferencing. This study demonstrates

Corresponding Author: Babak Tofighi MD, MSc, 180 Madison Avenue, 17th floor, NY, NY, 10016, 646-501-7743 (office), 646.501.2706 (fax), babak.tofighi@nyumc.org.

the feasibility of H+H ECHO among PCPs in publicly-funded clinics and improvements in self-efficacy. Studies are needed to identify alternative strategies to improve knowledge and prescribing of buprenorphine post-H+H ECHO.

Keywords

education; opioid use disorder; buprenorphine; vulnerable populations

1. Introduction

Opioid use disorder (OUD) remains a major public health burden. Differential uptake of effective treatments for OUD in primary care persists, particularly in lower income, Black, and Hispanic neighborhoods (Hansen et al., 2016). This disparity is further exacerbated by provider-level barriers to prescribing buprenorphine in primary care, including concerns about diversion, stigma, limited access to expert support, physician education, and inadequate clinical support during induction (Andraka-Christou & Capone, 2018; Kermack et al., 2017; Netherland et al., 2009).

Expanding buprenorphine treatment in primary care may be facilitated by leveraging emerging technologies (e.g., web-based modules, clinical decision support systems) that reinforce clinical guidelines (Egan et al., 2010; Gunderson et al., 2006). Project ECHO (Extension for Community Healthcare Outcomes) utilizes a "hub and spoke" model to connect centralized experts and participating providers to facilitate didactic lectures and case-based learning to enhance the delivery of care for a spectrum of health outcomes (e.g., OUD, Hepatitis C infection, pain management) (Komaromy et al., 2016; Zhou et al., 2016). Sockalingam and colleagues utilized a Project ECHO model to significantly improve primary care provider (PCP) knowledge of management of mental health and substance use disorders (Sockalingam et al., 2018). In addition, Komaromy and colleagues described the rapid expansion in buprenorphine-waivered PCPs in New Mexico following the Integrated Addictions and Psychiatry (IAP) TeleECHO Clinic started in 2005 (Komaromy et al., 2016). Despite these promising findings, further studies exploring PCP acceptability and engagement with ECHO-based buprenorphine training to ensure improvements in knowledge and buprenorphine prescribing post-training are needed.

We evaluated the feasibility and potential effectiveness of the NYC Health + Hospitals Buprenorphine ECHO (H+H ECHO) program by assessing: 1) PCP enrollment and feedback to weekly trainings; 2) improvements in knowledge and self-efficacy based on pre-post training responses; and 3) increases in buprenorphine prescribing following participation in the H+H ECHO program.

2. Materials and methods

2.1. Sample and study sites

NYC Health + Hospitals is the largest public health system in the United States and includes 11 acute care hospitals and 18 Federally Qualified Health Center clinics. Since 2017, the New York City Mayor's Office, the Department of Health and Mental Hygiene, and NYC

Health + Hospitals leadership have bolstered funding and resources to address the opioid overdose epidemic. NYC Health + Hospitals' Buprenorphine ECHO program was launched in May 2018 by the Health + Hospitals Office of Population Health, in partnership with the Office of Behavioral Health, to enhance addiction education and accelerate the integration of buprenorphine treatment in primary care. The H+H ECHO hub was located within the Office of Population Health and addressed all aspects of H+H ECHO administration, including logistics, communication, and technology. In addition to supervising the weekly trainings, the hub paired participants with addiction specialist "mentors" across the Health + Hospitals network to address trainee queries relating to managing patients with OUD via telephone and email contact. The hub team organized a team of 3 specialists and 7 guest lecturers with extensive clinical and/or research expertise in OUD to deliver lectures and offer feedback to case discussions.

The initial cohort consisted of one PCP from 17 of the 18 total H+H ambulatory care clinics to ensure ubiquitous access to buprenorphine across the network. PCPs were invited to participate in H+H ECHO via telephone calls and emails from the Office of Population Health with clinic leadership. These providers agreed to complete DEA waiver training by the end of the training, and be designated as site "champions" encouraging administrative and clinical staff in their clinics to enhance the delivery of care for individuals with OUD. Participants were encouraged by the H+H ECHO team to attend at least 10 of the 16 sessions between May 2018 – August 2018 and share clinical experiences pertaining to buprenorphine treatment in the weekly sessions. The number of weekly sessions was based on the ECHO learning model refined by the University of New Mexico ECHO Institute (Komaromy et al., 2016). This study was reviewed and approved by the Institutional Review Boards of the New York University School of Medicine, NYC Health + Hospitals, and the Biomedical Research Alliance of New York.

2.2. Procedure

The H+H ECHO program consisted of 16 weekly one-hour sessions. The Zoom videoconferencing platform facilitated the video conferences and included a chat function to update facilitators with questions or comments in real-time. Participants were emailed a weekly agenda updating them on the training topic for that week and relevant journal articles. Training sessions consisted of a review of the agenda by the H+H ECHO hub team and a 15–30 minute didactic lecture led by a specialist, followed by a patient case presentation. Cases were submitted by spoke sites, in advance of the session, and were meant to elaborate on key points related to managing OUD and buprenorphine treatment and elicit feedback from other participants on strategies and best practices in a variety of real patient scenarios. The Poll Everywhere web- and text message system solicited participant feedback and responses in real-time. Trainees received a post-session summary email, as well as manuscripts pertaining to weekly training objectives.

2.3. Project ECHO training

The design of the H+H ECHO training was based on Substance Abuse and Mental Health Services Administration's (SAMHSA) Treatment Improvement Protocol (TIP) manuals(SAMHSA, 2018) guidance from the University of New Mexico ECHO

Institute(Komaromy et al., 2016), a thorough review of the literature (Egan et al., 2010; Komaromy et al., 2016; Sockalingam et al., 2018; Zhou et al., 2016), and additional feedback by addiction medicine specialists. Curriculum topics were continuously revised per participant feedback and consisted of 15–30 minute didactic lectures covering the following topics: induction to buprenorphine; consent and accountability; urine toxicology; special populations; stigma; buprenorphine management; office-based opioid treatment (OBOT) quality improvement; safe opioid prescribing; criminally justice involved populations; screening and tracking OUD; pain management; clinic and care management; technology-based interventions for OUD; motivational interviewing; and harm reduction. All trainees were encouraged to complete their Drug Addiction Treatment Act of 2000 (DATA) buprenorphine waiver training within 4 weeks after enrollment. Specialists included Internal Medicine and Psychiatry physicians, with extensive experience in managing OUD and prescribing buprenorphine in primary care.

2.4. Evaluation

Pre- and post-training surveys assessed knowledge (5-items) and self-efficacy (14-items), and were based on items provided by the University of New Mexico ECHO Institute (Komaromy et al., 2016). Open-ended questions assessed satisfaction with H+H ECHO sessions and suggestions for improving trainings. Buprenorphine prescribing patterns were captured from the electronic health record reports (i.e., Quadramed, EPIC) and analyzed per prescriber. Descriptive statistics summarized clinician demographic characteristics, rates of participation in H+H ECHO trainings, pre-post knowledge, and perceived self-efficacy. Open-ended responses pertaining to suggestions for improving the training were reviewed line-by-line to yield data clusters that were coded using an *a priori* coding scheme pertaining to each emerging domain.

3. Results

Participants were mostly female (12/17), Black (4/17), Asian (4/17), or Hispanic/Latino (2/17). Healthcare providers were board-certified in Internal Medicine or Family Medicine (n=16) and included one Nurse Practitioner. Participants attended an average of 9lectures (range, 1–15 sessions). Approximately half (53%) of participants attended at least 10 of the 16 sessions.

PCPs demonstrated minimal improvements in knowledge in post-training survey results (58.4%) versus pre-training (51.4%). The content area that did not yield improved knowledge pertained to the duration of abstinence from short- and long-acting opioids prior to induction on buprenorphine. Self-efficacy ratings among respondents increased at 16 weeks (73.2%) compared to pre-training (58.1%) results. Seven trainees were prescribing buprenorphine one month preceding the training to a panel of 104 patients. Most PCPs were prescribing buprenorphine (10/17) two months post-H+H ECHO training to a panel of 127 patients.

Suggestions for improving the didactic lectures included: additional training on pain management; induction to buprenorphine; managing psychiatric comorbidities; overcoming stigma among clinic staff; serving criminally justice involved populations with OUD;

updates on more advanced urine toxicology tests; and technology-based interventions for OUD. Trainees also requested didactic lectures on expanding social work and case management involvement in OBOT, improving screenings and referrals from emergency departments to primary care, and shifting negative perceptions of patients with OUD among clinical staff. Overall feedback for improving the H+H ECHO program included archiving recordings of video lectures, clinical shadowing of experienced buprenorphine providers, and increasing the involvement of non-physician clinical staff.

4. Discussion

The NYC Health + Hospitals Buprenorphine ECHO program offers a feasible approach to deliver training pertaining to OUD and buprenorphine treatment. However, attendance varied in weekly training sessions and may be attributed to the lack of reimbursement for time allocated to lectures, unanticipated scheduling conflicts with clinic and administrative responsibilities, or fading interest in managing OUD. Suggestions for improving engagement in H+H ECHO sessions included multimodal learning strategies allowing trainees to learn material through a variety of sensory modalities, including audio (e.g., podcasts) and/or visual (web-based modules) platforms. Trainees also cited increased shadowing experiences with Addiction Medicine and Addiction Psychiatrists. Such peer-to-peer connections may reduce feelings of professional isolation, facilitate the diffusion of evidence-based practices by experienced providers, and deepen a sense of community among providers.

There were minimal improvements in knowledge and buprenorphine prescribing post- H+H ECHO. PCP knowledge may be improved by utilizing multimodal training platforms (i.e., podcasts, web-based modules), case-based education, electronic notifications to improve guideline-based management of OUD among trainees, and point-of-care training by pairing participants with addiction medicine specialists during clinical encounters. Low rates of buprenorphine prescribing may be attributed to inadequate screening and referral of patients with OUD in tertiary- and primary care settings, negative treatment experiences among patients with OUD in ambulatory care sites, or limited staff support facilitating buprenorphine treatment (Andraka-Christou & Capone, 2018; Kermack et al., 2017; Netherland et al., 2009). Further studies are needed to identify strategies and modifications to the Project ECHO curriculum that will ensure high rates of prescribing among buprenorphine providers post-training (Jones & McCance-Katz, 2018).

Lastly, requests for additional training on expanding the role of non-physician staff (i.e., social work, case management), addressing stigma among clinical staff, integrating efficacious referral strategies to primary care, and adopting emerging technologies (e.g., smartphone applications, web-modules) underpin the importance of engaging providers in performance improvement. These findings reflect emerging models of primary care that increasingly emphasize task-shifting, patient education, patient-physician communication, and operations management.(Goodall, 2011) Evidence now suggests that effective "frontline" clinical leaders enhance clinical outcomes.(Bohmer, 2010) Further studies are needed to assess whether ECHO trainings focusing on clinical leadership overcome systems- and provider-level barriers to addressing OUD and yield improved patient outcomes.

Limitations to this exploratory study included: 1) the lack of generalizability of findings due to inclusion of mostly physicians (16/17) located in New York City and only affiliated with the Health + Hospitals network; 2) the small sample size and lack of a comparison group did not allow for significance testing and detecting a true effect between the training and primary outcomes; and 3) the need for longer-term assessments ensuring sustained effects of the training (i.e., buprenorphine prescribing, retention of knowledge, and self-efficacy).

Conclusion

These findings suggest the feasibility of Project ECHO in enhancing perceived self-efficacy among PCPs. However, improvements in knowledge and buprenorphine prescribing were minimal post-training. These results will inform modifications to the NYC Health + Hospitals Buprenorphine ECHO curriculum and the launch of a second cohort of providers.

Acknowledgements

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Highlights

Project ECHO enhanced perceived self-efficacy in managing opioid use disorder.

The number of physicians prescribing buprenorphine increased post-training.

Trainees demonstrated minimal improvements in knowledge in following the training

Post-training surveys yielded course-related feedback to improving Project ECHO.