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Barriers and Perceived Usefulness of an ECHO Intervention for Office-Based Buprenorphine Treatment for Opioid Use Disorder in North Carolina: A Qualitative Study

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Abstract

Background: Medication treatment for opioid use disorder (M-OUD) is underutilized, despite research demonstrating its effectiveness in treating opioid use disorder (OUD). The UNC Extension for Community Healthcare Outcomes for Rural Primary Care Medication Assisted Treatment (UNC ECHO for MAT) project was designed to evaluate interventions for reducing barriers to delivery of M-OUD by rural primary care providers in North Carolina. A key element was tele-conferenced sessions based on the University of New Mexico Project ECHO model, comprised of case discussions and didactic presentations using a “hub and spoke” model, with expert team members at the hub site and community-based providers participating from their offices (i.e., spoke sites). Although federal funders have promoted use of the model, barriers for providers to participate in ECHO sessions are not well documented.

Methods: UNC ECHO for MAT included ECHO sessions, provider-to-provider consultations, and practice coaching. We conducted 20 semi-structured interviews to assess perceived usefulness of the UNC ECHO for MAT intervention, barriers to participation in the intervention, and persistent barriers to prescribing M-OUD.

Results: Participants were generally satisfied with ECHO sessions and provider-to-provider consultations; however, perceived value of practice support was less clear. Primary barriers to participating in ECHO sessions were timing and length of sessions. Participants recommended recording ECHO sessions for viewing later, and some thought incentives for either the practice or provider could facilitate participation. Providers who had participated in ECHO sessions valued the expertise on the expert team; the team’s ability to develop a supportive, collegial environment;

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and the value of a community of providers interested in learning from each other, particularly through case discussions.

Conclusions: Despite the perceived value of ECHO, barriers may prevent consistent participation. Also, barriers to M-OUD delivery remain, including some that ECHO alone cannot address, such as Medicaid and private-insurer policies and availability of psychosocial resources.

Introduction

Approximately 70,000 people died from drug overdoses in the United States (US) in 2017, double the number from ten years before.[1] Approximately 70% of these overdose deaths involved opioids.[1] The increases in overdose deaths are so large that they are contributing to decreases in overall life-expectancy in the US.[2] Although medication treatment for opioid use disorder (M-OUD) with naltrexone, buprenorphine, or methadone is effective in treating opioid use disorder, M-OUD is vastly underutilized.[3] US federal regulations restrict provision of M-OUD to providers who obtain waivers to prescribe buprenorphine from office-based settings and to specialized opioid treatment programs (OTPs) that can directly dispense methadone or buprenorphine.[4] It is estimated there are only enough M-OUD waivered providers in the United States to treat half of all individuals with opioid addiction or dependence.[5] This shortage of M-OUD providers is especially severe in rural areas where there are few specialists.[6] Interventions are needed to increase the number of M-OUD providers, particularly in areas with few specialists.

Of the medications that can be used in M-OUD, buprenorphine is the most promising for expanding access to treatment because it can be prescribed in office-based settings and individuals do not need to abstain from opioids to start treatment. As noted above, physicians, nurse practitioners, and physician assistants in the US must obtain waivers to prescribe buprenorphine in office-based settings.[7] Initial waivers allow these providers to treat up to 30 patients, with the possibility of expanding to 100 after one year and 275 after an additional year.[8] However, there is evidence that providers who prescribe buprenorphine often treat small numbers of patients, fewer even than would be allowed under the smallest buprenorphine waiver,[9] and a recent survey of waivered providers in rural areas found that nearly half were not accepting new patients for treatment.[10]

Several studies have documented barriers that physicians perceive to providing buprenorphine treatment for OUD in office-based settings.[11–16] Such barriers include lack of belief in treatment efficacy, low reimbursement rates, limited time, lack of availability of psychosocial support services, lack of institutional support, lack of expert consultation, insufficient office support, and prior authorizations. Despite identification of these barriers, there is limited evidence of strategies to support providers' efforts to deliver buprenorphine treatment.

One potentially promising strategy for supporting providers in the delivery of M-OUD is the ECHO (Extension for Community Healthcare Outcomes) model, a tele-conferencing intervention to improve the ability of rural primary care providers to manage complex conditions.[17] A systematic review of outcomes for providers and patients whose providers participate in ECHO sessions suggests promising results in various settings and populations

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(e.g., rural populations, veterans, and prison inmates) and for various conditions.[18] Subsequent studies also suggest that ECHO is effective; for example, a recent qualitative study of an ECHO for chronic pain management indicated provider increases in knowledge and confidence, use of knowledge across patients (i.e., not just for a single patient), and diffusion of knowledge to providers not participating in the ECHO. The same study also found barriers to ECHO participation, including time constraints and technology issues.[19] However, additional studies are needed to further specify barriers to participating in ECHO sessions, specifically sessions in the context of M-OUD.

In 2016, the University of North Carolina at Chapel Hill received a grant from the Agency for Healthcare Research and Quality (AHRQ) to develop the UNC Extension for Community Healthcare Outcomes for Rural Primary Care Medication Assisted Treatment (UNC ECHO for MAT) project to support rural primary care providers in providing M-OUD. The current study sought to assess the perceived usefulness of the UNC ECHO for MAT intervention, barriers to participation in the intervention, and other barriers to M-OUD. To do so, we conducted semi-structured interviews with providers and administrators who had expressed interest in and/or participated in the intervention. Our goal was to use the data collected to inform refinements to the intervention and the design of future ECHO projects for M-OUD at other institutions.

Methods

Description of ECHO for MAT Intervention

The study reported in this article was one of several under the UNC ECHO for MAT project, a demonstration project funded by AHRQ. The goal of the UNC ECHO for MAT project was to design and evaluate a multifaceted intervention aimed at reducing barriers for primary care providers to offer M-OUD. The multifaceted intervention included support for obtaining buprenorphine waivers, ECHO sessions, provider-to-provider consultations, and practice coaching. ECHO sessions were based on the University of New Mexico Project ECHO model, using a “hub and spoke” model, with a team of M-OUD experts at a hub site and community-based providers from across the state in their individual practice locations (i.e., the spokes) connected via Zoom video conferencing technology (https://zoom.us). Each ECHO session was scheduled for two hours, including (1) de-identified cases, presented by rural community-based practitioners, which then were used for facilitated case-based learning dialogs and (2) a brief didactic presentation, led by a member of the expert team, based on evidence-based approaches to treating opioid use disorder. Participants in the UNC ECHO for MAT intervention also had access to one-to-one consultations, outside of ECHO sessions, with providers on the expert team. The practice coaching component included suggestions for patient screening, patient-care management tools, M-OUD clinic structure best practices information, protocol examples, and assistance with engaging community treatment resources for their patients, among other resources to reduce resistance to treating patients with OUD and support successful M-OUD implementation. This multi-faceted approach aimed to increase providers’ confidence and reduce practice-level barriers to M-OUD implementation.

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Data Collection

We conducted semi-structured interviews by telephone to assess the UNC ECHO for MAT intervention barriers and usefulness. Our interview guide was informed by the Consolidated Framework for Implementation Research (CFIR)[20] and was reviewed by an addiction expert. The CFIR has been used previously to guide assessment of readiness and capacity for implementing ECHO.[21] The CFIR consists of five domains: characteristics of the intervention, outer setting, inner setting, characteristics of individuals, and process. Each of these five domains is comprised of multiple factors or dimensions. Characteristics of the intervention refers to the nature of the program, service, or practice that is being implemented and includes such dimensions as adaptability and cost. Outer setting refers to factors external to an organization, including patient needs and resources and external policies and incentives. Inner setting refers to factors within the organization, such as culture and implementation climate. Characteristics of individuals refers to attributes of the intended users of the intervention, including knowledge and beliefs of the intervention and self-efficacy. Process refers to implementation activities, including planning and engaging stakeholders.[20] The first several interviews were conducted by two research team members (CS and AG) to ensure that the interview guide was sufficiently capturing desired information, and subsequent interviews were conducted by AG alone. We contacted 48 individuals via email to request participation in an interview. These 48 were all of the individuals who, at the time of data collection, had either participated in or expressed interest in the ECHO intervention during recruitment efforts. Twenty-three individuals did not respond. Five individuals responded but declined to participate. Of the 20 individuals we interviewed (between November 2017 and April 2018), 10 were practicing physicians, 3 were nurse practitioners, 3 were behavioral health specialists, and 4 were not practicing clinically but held leadership positions within their organization or health system (e.g., medical director, chief of behavioral health). Twelve of the 20 participants had received their buprenorphine waiver. Four of the practicing physicians and behavioral health specialists also held organizational or system leadership positions.

Because the interviews took place early in the ECHO for MAT intervention period, no interviewees had substantial experience with all three components of the intervention (i.e., ECHO sessions, one-on-one provider consultations, and practice coaching). Several interviewees had received a provider-to-provider consultation and/or communicated with a practice coach; however, none had received on-site practice coaching. Ten of the twenty interviewees had participated in at least one ECHO session. Although the focus of the interviews was on barriers to participation in the ECHO for MAT intervention, we also asked about barriers to M-OUD. Each interview lasted approximately 30 minutes and was recorded and professionally transcribed. The study was reviewed by the UNC Institutional Review Board (IRB#: 16-2374).

Data Analysis

To examine perceived usefulness of the UNC ECHO for MAT intervention, barriers to participating in the intervention, and persistent M-OUD barriers, we used two phases of coding. For our first phase, we employed a combination of evaluation coding consisting of descriptive codes (parent and child) and magnitude coding to represent positive or negative,

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for example, whether clinic leadership was supportive (positive) or not supportive (negative) of M-OUD.[22] We developed our codebook using CFIR domains (i.e., outer setting, inner setting, individual characteristics, intervention characteristics) as parent codes and dimensions within each domain (e.g., external policies and incentives, leadership engagement, self-efficacy, cost) as child codes. We also developed codes to differentiate between the distinct aspects of the ECHO for MAT intervention (i.e., case discussions, didactics, provider-to-provider consultation, practice coaching). This phase enabled aggregate reports for each code and identification of initial themes based on frequency of codes and saliency of issues. In this phase, two research team members coded each interview transcript. For the second phase, the two research team members prepared individual profiles of each transcript. This second phase enabled in-depth analysis of each interview to promote clearer understanding of context and identification of illustrative quotations for themes. More specifically, the two team members developed a profile template to summarize the characteristics of each respondent (such as practice setting and provider type) alongside the primary themes conveyed by the respondent in the form of representative quotations. This phase allowed us to consolidate the primary points communicated by respondents while elucidating relationships between themes and provider characteristics.

Results

In general, interviewees reported that the ECHO sessions were useful. However, many barriers to participating in the ECHO sessions were identified, and interviewees suggested possible solutions. Despite the perceived benefits of the ECHO sessions, interviewees also identified several persistent barriers to delivering M-OUD in their practices. Although most interviewees did not have experience with each component of the ECHO for MAT intervention (i.e., ECHO sessions, provider-to-provider consultations, and practice coaching) several participants provided information about why a specific component was or was not perceived as necessary for them individually or for their organization. Below we summarize the results by themes for ECHO usefulness, ECHO barriers, recommendations for improving ECHO sessions, and M-OUD barriers not address by ECHO sessions. Table 1 provides illustrative quotations for each theme.

ECHO Session Usefulness

Providers who participated in ECHO sessions generally found the case-based learning and didactic content to be useful, particularly the case discussions and the welcoming environment created by the team.—ECHO sessions consisted of two case presentations by participants at spoke sites and one didactic session led by a member of the expert team at the hub site. Ten of the twenty interviewees had participated in at least one ECHO session. Within this subset of the sample, participants reported that the case discussions were useful, especially for providing guidance on issues that might not be detailed in practice guidelines, such as how to respond to a positive urine drug screen or how to address suspected diversion of medications. One interviewee provided examples of the types of questions that ECHO helped elucidate: “What happens with noncompliance, or what is considered noncompliance? If somebody is on Suboxone but then they keep showing up positive for benzos or cocaine, is the provider expected to then reduce their dosage? And

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that kind of thing. Or we increase outpatient treatment expectations, or higher levels of care?" Participants generally had more to say about the usefulness of the case discussions than about didactic sessions. This difference may be due to some participants having joined the case discussions but not the didactic sessions; however, even among those who had experienced both, the case discussions generally were the most valued component. Notably, participants with more M-OUD experience found didactics less useful. Many participants had not joined ECHO sessions each week and, therefore, appreciated that didactics were not explicitly sequenced and, instead, could stand alone. Participants commonly spoke about the diversity and depth of expertise that the ECHO team members brought to the sessions. Participants also commonly reported that they appreciated the collegial, non-judgmental learning environment that the team created. According to one participant, "The experts … clearly knew what they were doing. The flip side is there's certainly a level of humility about 'Yeah, we don't have all the answers either,' which I think is real reassuring."

Barriers to Participating in ECHO Sessions

Many participants have difficulty participating in ECHO sessions regularly due to the time of day and length of time required for the sessions, particularly if they do not have organizational support for doing so.—By far the most common barriers mentioned by participants were the timing and length of ECHO sessions. According to one participant: "I think it's very useful. I would participate more, but I have clinics scheduled on Wednesday afternoon, so I'm actually trying to change that. That's a space-utilization, nursing-availability issue in my own practice that I need to sort of sort through before I can say, 'Oh yeah, we'll just do this. I'll switch everybody to Tuesday afternoon so I can do [M-OUD], or do the ECHO,' but I really want to reach that point." Several participants acknowledged the challenge of finding one time that suits all interested providers due to differences in schedules. Most participants reported that they did not attend both case discussions and the didactic in a session because they did not have two hours available to do so. Despite the fact that the ECHO clinic was designed to provide participants flexibility in terms of length of participation (i.e., participants may enter the clinic late or leave early), some participants perceived an expectation of participating for the full two hours and/or feared they might miss important content if they did not participate for the full time. Some participants happened to have availability to participate on the scheduled day and time due to their current patient schedules, but that availability was somewhat tenuous because schedules could change. Providers in private practice who have control over their schedules may choose to invest the time in ECHO, at least temporarily, though it could come at the cost of revenue. A participant in private practice explained that they planned their schedule to accommodate ECHO for a limited time: "I decided to build my case load around ECHO, so I'd built up my practice working in the morning and the afternoons, and taking that two hour break, and committed to do that for six months. The truth is that I really cannot afford the time." Providers in health systems had less flexibility, noting organizational expectations of seeing a specific number of patients in their practices as a barrier to ECHO participation. Multiple participants spoke about the importance of leadership support for creating time in the schedule for providers to participate in ECHO. However, even if they could allocate time to participate in ECHO, unexpected patient or

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practice issues sometimes arose that prevented them from participating in a given ECHO session.

Participant Recommendations about All Components of the ECHO for MAT Intervention

Participants offered several suggestions for enhancing the accessibility and usefulness of ECHO sessions as well as the usefulness of provider-to-provider consultations and practice coaching. Below we have categorized the recommendations.

Ensuring participants get the most out of their time in the ECHO Session— Participants recommended providing more information prior to the ECHO session about the case types and topics for the day so that individuals could decide if the session is of interest. Participants also recommended specific content areas to cover, notably group visits and practice management issues related to M-OUD. Finally, some participants suggested condensing the ECHO sessions into a shorter amount of time. One participant said, “I think it could be condensed somewhat into, just time-wise. Often, I feel that the cases may be a little labored, but if it were a 90-minute period that’d be great.” Another participant reported that there appeared to be an expectation for each ECHO team expert to comment on every case; however, eliminating that expectation could reduce repetition of comments and save time.

Increasing Accessibility: Timing, Incentives, and Recordings—Regarding increasing accessibility, several participants suggested changing the time of the ECHO sessions to either early morning or night so that it does not conflict with patient scheduling. Having the ECHO sessions at multiple times or not at the same day/time every week also could facilitate participation. When asked about financial incentives for participating in ECHO sessions, many participants believed financial incentives would increase participation, although there was not agreement on whether an incentive should be given to the provider or to the practice. Participants from practices with explicit expectations of patient volume expressed that incentives to the practice could be helpful in order to buy out a provider’s time to participate in ECHO sessions. Participants who were administrators also indicated incentives would be helpful for increasing ECHO session participation. However, some participants did not believe incentives would be helpful at all. The primary argument offered against incentives was that providers, particularly in rural underserved areas, are so overwhelmed with patient demand (and related activities such as documenting in the electronic health record) that they could not make time to participate even with incentives. Finally, having ECHO session content available asynchronously (e.g., recordings of didactic materials) was widely regarded as a promising approach for increasing accessibility of the content.

Provider-to-Provider Consultations—Although most participants had not participated in provider-to-provider consultations with expert providers through the UNC ECHO for MAT intervention, they strongly endorsed the importance and potential usefulness of the consultations. Many providers had found ways of accessing one-to-one consultation with experts through either formal or informal arrangements (i.e., primarily outside of UNC ECHO for MAT). Most of these providers saw provider-to-provider consultations as a

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complement rather than as a replacement to ECHO sessions. Providers also reported one-to-one consultations gave them more flexibility than ECHO to discuss specific, time-sensitive issues that arose in practice. As one provider explained: "There would have been times I wouldn't want to take the entire [ECHO session] time, but it would be really nice to sort of pick up and curbside somebody for five minutes saying, 'I've got this particular thing. How would you feel about that?' It turns out we actually have somebody … [who] sort of plays that role for a lot of us here out west. He's willing to do an email or a short telephone consultation."

Practice Coaching for M-OUD—The practice coaching component of the UNC ECHO for MAT intervention involves remote and in-person technical assistance and support, clinic work flow assessment, training, resource identification and referral, and other forms of organizational or systems supports for the practice teams of the identified participant providers. Because our interviews took place during the early stage of the UNC ECHO for MAT implementation, at the time of the interviews none of the participants had yet received practice coaching. In general, interviewees offered mixed views of the usefulness of practice coaching, which may be due at least in part to a lack of clarity about which services practice coaching might provide. Some participants also mentioned that (1) they had internal organizational resources or existing partnerships that would provide practice support; (2) their practice was capable of handling the M-OUD without practice support; or (3) their administrative staff currently did not have time for practice coaching.

Persistent Barriers to M-OUD

Interviewees identified several barriers to delivering M-OUD, many of which may not be directly addressed by ECHO sessions. These barriers reflect factors in the external environment (outside of the provider's practice), characteristics of the provider's practice, and characteristics of M-OUD as an intervention.

Providers face administrative burdens and insufficient reimbursement for Medicaid and private insurers, lack of psychosocial services in the community, and reputational concerns.—Participants identified three prominent barriers in the external environment, which map to the outer setting domain of CFIR. First, administrative burdens from Medicaid and private insurers are problematic, particularly related to prior authorizations. Second, participants identified a lack of availability of psychosocial resources in the community as a barrier to providing such services needed for M-OUD (e.g., behavioral counseling). According to one participant, "There are sort of organizational things that [ECHO sessions talk] about … best practices, and here's how you really should be handling the situation. However, you don't always have the resources to do something. For example, I don't really have an option for a higher level of care for my patients in this community… I live in a town of 2,000 people…I don't have that ability to just be like, 'Oh, well, we stepped them up to this next level of care.'" Third, participants commonly mentioned reputational concerns due to attitudes within the community about substance use. Specifically, participants were concerned about their patients not feeling comfortable being in the same practice with individuals who have substance use disorders. Some participants suggested that providing M-OUD may be viewed as outside the scope of

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primary care. Finally, some participants expressed that system leaders and other medical professionals in their communities believe the opioid epidemic is caused by opioid prescribing and that M-OUD, as a form of opioid prescribing, could perpetuate the problem. One participant emphasized pharmacists, in particular, questioning the motives of prescribing medications for OUD.

Lack of leadership support and negative attitudes toward M-OUD among administrative staff contribute to the burden on providers.—Without support from leadership within their system and/or organization, providers may choose not to invest time in training for and delivering M-OUD. For example, lack of support could be reflected through policies intended to limit opioid prescribing that do not distinguish between opioid prescribing for chronic pain and OUD. This lack of leadership support is consistent with the inner setting domain of the CFIR framework. Furthermore, some participants identified administrative staff attitudes toward substance use as a barrier because without adequate administrative support, the burden of coordinating the logistics of M-OUD delivery falls to the provider. This concern relates to the individual characteristics domain of CFIR (i.e., beliefs about the intervention) as well as the inner setting domain (i.e., structural characteristics in terms of the presence of in-house staff delivering psychosocial support). According to one participant, "[C]oncerns about the stigma associated with providing [M-OUD] in a primary care clinical setting, I personally don't have a concern about it, but I've certainly seen the issues of concerns from staff members, clerical staff, nursing staff, and I'm grappling a little bit with the issue of administrators becoming a little concerned about the provision of [M-OUD] in a clinical setting." One example of the increased burden for providers is coordinating with psychosocial services in the community. Having psychosocial resources located within the provider's clinic can ease that particular burden; however, such resources were not common within our sample. Participants identified lack of reimbursement from Medicaid and private insurers for integrated models of primary care and behavioral health delivery as a barrier to improving availability of psychosocial services.

M-OUD is viewed as a complex intervention with high costs for practices, providers, and/or patients.—Some interviewees reported that practices are reticent to provide M-OUD because reimbursement likely does not cover the cost of provision. As suggested above, M-OUD is perceived to be a complex intervention as it frequently involves more than prescribing buprenorphine. Providers also need to be able to identify and address issues that may be related to patient success with M-OUD, such as use of other substances, mental health conditions, or lack of employment, transportation, or social support. Providers must be prepared to address issues of stigma within their practice, define protocols for OUD patients, and connect patients with psychosocial resources outside of the practice. The complexity of MAT aligns with the characteristics of the intervention domain from CFIR. In general, participants suggested that the waiver training required in the US to prescribe buprenorphine from office-based settings is not sufficient for acquiring the knowledge necessary to provide M-OUD. According to one provider, "Suboxone training is pretty darn short, especially for docs. It's eight hours. And it's a big kind of scary disease to treat—spectrum disorder to treat with only an eight-hour training. Especially if you might have the training and not get to the point where you're able to take patients for another three months

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or six months. So I think having, knowing that you have an elite force basically to reach out to for help and questions encourages people to do this when they might not otherwise do it."

***Providers' Perceived Self-Efficacy Related to Delivering M*-OUD Appears to Increase with Experience—**Even those who had participated in some ECHO sessions suggested that developing confidence in delivering M-OUD requires substantive experience doing so. More specifically, some interviewees reported that feelings of intimidation about M-OUD provision subsided once they began prescribing, that their perception of the complexity of M-OUD provision also decreased particularly for stable patients, and that they felt satisfaction at seeing patients improve with M-OUD. According to one provider, "Initially I was a little somewhat anxious about it, and that quickly sort of dissolved into 'Gee, I wish I had been doing this a long time ago.' It's pretty dramatic how much it improves care." Such statements suggest that knowledge gaps and low self-efficacy related to M-OUD are addressable and that providers may realize enhanced job satisfaction by addressing these barriers. The findings correspond to the individual characteristics domain of CFIR, specifically self-efficacy.

Discussion

This study aimed to assess (1) the perceived usefulness of the UNC ECHO for MAT intervention to reduce barriers to providing M-OUD; (2) barriers to participation in UNC ECHO for MAT; and (3) persistent barriers to M-OUD that may not be addressed by the intervention. Participants were generally satisfied with the ECHO clinic sessions and endorsed the value of one-to-one provider consultations and mentoring; however, the perceived need for and potential usefulness of practice coaching was less clear. The primary barriers to ECHO session participation were the time and length of the sessions.

Participants generally reported that the ECHO sessions were useful for increasing their knowledge and confidence related to M-OUD. Notably, providers who had participated in ECHO sessions commented on the importance of the expertise on the hub team and the team's ability to develop a supportive, collegial environment, as well as the value of forming a community of providers interested in both learning from and supporting each other. The case discussions were particularly valued by participants. Participants also endorsed the value of one-to-one provider consultations. However, the perceived need for and potential usefulness of practice coaching was less clear and depended on the structure and services offered as well as internal (system-level or organizational) capabilities for providing the same services. The lack of perceived need for practice coaching expressed by some interviewees is notable given that we believe d help address some of the persistent barriers to prescribing M-OUD identified by interviewees, such as provider and staff attitudes toward opioid use and M-OUD, perceived complexity of M-OUD, and provider burden caused by administrative tasks and care coordination for this patient population. Although many providers reported not needing practice coaching, the strategy may be an effective way to address these remaining barriers, and perceptions about the lack of need for it may change after providers receive support from practice coaches.

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Despite the perceived value of ECHO sessions, barriers prevented many providers from participating in the sessions regularly. In response to, and consistent with, recommendations received during the interviews, the ECHO sessions have been adapted, specifically by increasing the number of ECHO sessions available (on different days and times), with some having a focus on specific settings (e.g., emergency departments). Participants also recommended recording ECHO sessions for later viewing, and some, but not all, thought incentives for either the practice or the provider would facilitate participation. However, questions remain about how best to structure multi-faceted implementation support for M-OUD. For example, it is not clear how providers decide which components of the support (ECHO sessions, one-to-one provider consultations, practice coaching) to access and when.

Despite satisfaction with ECHO, barriers to M-OUD remain that ECHO alone likely cannot address, such as the policies of Medicaid and private insurers, community attitudes toward individuals with OUD, and the availability of psychosocial resources in the community. These primarily fall within the outer setting domain of CFIR and are ones that providers and practices have least control over. Of course, the ECHO model is not designed to address all types of barriers. These outer setting barriers exemplify issues that ECHO sessions may not be able to resolve, at least not directly. As mentioned above, several participants pointed to the value of ECHO sessions in creating a community of providers who can share knowledge and also commiserate about the challenges of serving those with OUD. This community of providers, if they desire, potentially could help increase awareness of outer setting barriers among policy makers and insurers. Prior authorizations, patient ability to pay for medications, and reimbursement for M-OUD are barriers that may reduce the number of OUD patients a given waivered provider is willing to treat with M-OUD and may prevent some providers from seeking a waiver or providing M-OUD at all. Although providers generally viewed M-OUD as a complex and resource-intensive intervention to implement, the perceived complexity of M-OUD appeared to subside after implementation, and providers expressed satisfaction with M-OUD provision. As suggested above, ECHO sessions, mentoring and practice coaching may accelerate providers' transition from perceiving M-OUD as being highly complex to experiencing satisfaction from delivering the service.

Our study has limitations worth noting. First, because our study was limited to providers who had been contacted for recruitment to the ECHO for MAT intervention, the findings may not be generalizable to all providers or to other ECHO projects. However, our study does advance understanding of implementation of ECHO for MAT, particularly in terms of barriers to participation in ECHO and the ways in which ECHO can address barriers to M-OUD. Second, because many of the interviewees had not received the one-to-one provider consultations and/or practice coaching components of the ECHO for MAT intervention, much of the input about these support strategies focused on perceived need (or perceived lack of need) and potential usefulness. Future studies should evaluate the impact of these strategies, with a focus on determining the specific needs addressed by each of the three components, so that providers and practices know which component to use, when to use it, and how the strategies complement each other.

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Conclusions

This evaluation of the early phase of the UNC ECHO for MAT intervention suggests that participants find the ECHO sessions to be useful because the sessions provide guidance about how to address complex issues for specific OUD patients. Interviewees reported that the ECHO sessions helped increase their confidence in delivering care for their patients with OUD, as feelings of intimidation subsided once they began prescribing, their perception of the complexity of M-OUD decreased, and they found satisfaction in seeing patients improve with M-OUD. Furthermore, one-to-one provider consultation also was viewed as valuable. Practice coaching was the least utilized to date intervention during this early implementation phase and was perceived as potentially valuable by some participants, but that perception was not universal, as some participants believed that they already have the necessary capability within their system or organization to manage M-OUD delivery or support its implementation. Despite the perceived usefulness of the ECHO session case-based discussions and didactic content, there are substantial barriers to participating in ECHO sessions, which are challenging for providers to overcome without some flexibility in the ECHO session structure and timing and/or support from their health system or practice leadership.

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Table 1:

ECHO for MAT Barriers and Perceived Usefulness for Addressing Challenges to Delivering MAT

Theme	CFIR Domain	CFIR Dimensions	Illustrative Quotation
Providers face administrative burdens and insufficient reimbursement for Medicaid and private insurers, lack of psychosocial services in the community, and reputational concerns.	Outer Setting	External policies and reimbursement	"Definitely the high-cost of medication [is a barrier]. We have a grant to subsidize the cost. However, where I practiced earlier, we didn't have a grant, but at least we had Medicaid expansion. Now I have patients who are insured, but now I'm having problems with getting prior authorization approval through their insurance company. A lot of that has to do with the cost of the medication itself." – Primary Care Physician "I'm in private practice by myself. I've been working on designing a collaborative since last year. So, I have been trying to form relationships with providers in the community for counseling services and behavioral health. Searching for collaborative partners and working on the ways the payments could be shared, and finding counselors. I have made a number of contacts there." – Primary Care Physician
Providers may lack the leadership and administrative support as well as internal psychosocial resources to implement MAT in their practice, which exacerbates concerns about the time required for delivering MAT.	Inner Setting	Leadership support, structure	"Definitely the big game changer here is that my boss was super supportive of it when I said, 'I'm kind of interested in this.' She's like, 'That's amazing. That's great. Do it. Go for it,' whereas if I had brought it up at my old practice, she was like, 'Ehhhh.'" – Medical Director and Primary Care Physician "It would be super helpful to have somebody who was able to do some of the work that you can do to prepare for a patient's visit. For example, for every patient at the beginning of the week I try to check the North Carolina state controlled substance registry. Right? That's something that a support person could do. It doesn't have to be clinical. Also, keeping track of patients' medication practices and where they pick up their scrips. Following up with patients. All kinds of stuff." –Primary Care Physician
Some providers lack the attitude toward OUD needed to effectively deliver MAT; others, have supportive attitudes but lack the knowledge of MAT and/or confidence needed to deliver MAT.	Individual Characteristics	Beliefs and knowledge	"I mean I think it's sort of like I was feeling real good about [prescribing buprenorphine], and then when I had my first patient on my schedule I was like, 'Oh my gosh I don't know anything.' But that's okay, because I had the resources and information website from some of those lessons to kind of put my brain together and get a plan in place." – Medical Director and Primary Care Physician "The training for this … for Suboxone [waiver] training is pretty darn short, especially for docs. It's eight hours and it's a big kind of scary disease to treat … Especially if you might have the training and not get to the point where you're able to take patients for another three months or six months." –Nurse Practitioner
MAT is viewed as a complex intervention with high costs for practices, providers, and/or patients.	Intervention Characteristics	Complexity, Cost	"We have a system, an operational system, where providers appointments are largely filled six months in advance because of the inordinate amount of need to access for basic health care. So, during our 20-minute visit in addition to addressing the patient's diabetes, heart disease, hypertension, depression, anxiety, trauma, et cetera we are now going to need to incorporate into that 20 minutes an evaluation, a team-based evaluation, of readiness for medication assisted treatment. And, at the moment, I only have one provider who I hired recently who I was able to block a half a day a week to help with inductions. But, that provider is then going to need to transfer the responsibility of maintaining the stable MAT regimen to a co-worker [with a] DEA license. And, so I think that there may be limitations in how expeditiously we can roll this out to our patients based on operational limitations and based on DEA limitations and the number of prescribers who can be prescribing the MAT for an individual, as well as limitations based on the pharmaceutical industry's extremely limited charity." – Medical Director and Primary Care Physician
Providers who participated in ECHO for MAT generally found it to be useful, particularly the case discussions and the welcoming environment created by the team.	N/A		"Somebody has an abnormal [urine drug screen] and what are you going to do with that? And it's that discussion about, 'What does that mean? What's your next step?' So it's more conversations just about managing the patients' other problems that may be going on in their lives. As far as prescribing the medication I don't generally have a lot of concern, but it's just all the other ins and outs that it's just nice to have someone to talk to." – Primary Care Physician "That was helpful for us because that's not a population we've taken care of a lot, but it's a population that needs care and I think that the availability of ECHO, for me personally, gave me a little more confidence to say yes to taking care of that patient and being able to do that. Unfortunately, she has lost insurance and that has created a totally different set of barriers with her, but I feel like that was really positive. So it's especially helpful for cases that aren't quite in the ordinary." – Nurse Practitioner

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Theme	CFIR Domain	CFIR Dimensions	Illustrative Quotation
			"I'm not quite sure should I be prescribing, should I be seeing the patient more often? It's just great to learn from the other providers about their experience and how they're doing." –Primary Care Physician "The experts were, they clearly knew what they were doing. The flip side is there's certainly a level of humility about yeah, we don't have all the answers either, which I think is real reassuring. They were really not judgmental of the folks out on the spokes." – Chief Medical Officer and Primary Care Physician "The didactics tend to be more kind of the straight forward teaching information, which is also really important, especially at this stage for me. Kind of more practical things and just more knowledge type information." -- Medical Director and Primary Care Physician
Many participants have difficulty participating in ECHO for MAT regularly due to the time of day and length of time required for the sessions, particularly if they do not have organizational support for doing so.	Intervention Characteristics, Inner Setting	Adaptability, leadership support	"I decided to build my case load around ECHO, so I'd built up my practice working in the morning and the afternoons, and taking that two hour break, and committed to do that for six months. The truth is that I really cannot afford the time, because the practice is full enough on those Wednesdays that I need those two hours, I'll probably continue doing it for quite a while." – Nurse Practitioner
Ensuring participants get the most out of their time in ECHO	N/A		"I could see a case conference where you're doing more complex psychiatric care or complicated multi-disease" – Chief Medical Officer and Primary Care Physician
One-on-one consultations and mentoring	N/A		"So if I would have had something like ECHO, especially with a line that I could call as I was thinking about getting started, I would have been a little bit more likely to have started prescribing there. So, I'm just trying to think of things that would help people who are out in a low resource setting, give them that final push of, 'Okay, there's enough support. I can do this. I don't have to be perfect, but I'll have somebody I can call as I'm learning to do this to get some assistance.'" – OB/GYN Physician "I think I've just been fortunate in that as far as having other MAT providers that I can call. So I mean that's the biggest thing for me, especially learning to do this is when I have a patient and I have a question right then, and I need some guidance, I need some answer. If there were an ideal world, like a hotline that you could call and get an experienced provider and run a clinical scenario by or get some answers provided" – OB/GYN Physician
Practice support for MAT	N/A		"So I think other people getting started in MAT to have a coach come out and say, 'Here's how you actually set it up,' or, 'Come to our clinic and see how we function,' was … We found it very useful when we were starting our clinic." – OB/GYN Physician
Increasing accessibility: timing, incentives, and recordings	N/A		"I mean, maybe if the time changed now and then. It's hard because it's easier for some when it's at the same time every time, because then they can plan it in their schedule ahead of time and have a routine, but for me, if it moves around a little bit that might actually be easier, or if there were other options that might be actually a little easier for me." – Medical Director and Primary Care Physician "I think that it would also be helpful if there was another time it was offered at. Right now works … I don't know what would work. It seems that maybe having one that was in the morning or at the end of the day, having a little bit more flexibility would be really helpful." – Primary Care Physician "It wouldn't be the same in terms of participation, but if it could be recorded … Like webinars, so you've got the live, and then you've got the recorded version that people could witness in their own time, on a weekend or whatever, and so they don't get to ask questions directly because it wouldn't be live, but they would get to have the experience of what went on during the clinic." – Nurse Practitioner