Development and Testing of a Digital Coach Extender Platform for MOUD Uptake

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BOTH THE CRIMINAL legal system (CLS) and the health systems are complex, and their interagency relationships can further complicate effective dissemination, adoption, implementation, and sustainment of evidence-based practices and treatments, including the implementation of medications for opioid use disorder (MOUD). Coaching is a favored implementation strategy,[1,2] but it is labor intensive for the coach, the organization, and the involved staff. This is a substantial barrier and often makes this pivotal implementation strategy costly, particularly in human resources. Accordingly, coaching techniques need to be designed for scaling up and affordability to maximize the full potential of the external coaching function. Researchers at the University of Wisconsin–Madison and George Mason University under the Justice Community Opioid Innovation Network (JCOIN) funded by the National Institutes of Health (NIH)'s (U2CDA050097, MPI Taxman and Rudes), Helping End Addiction Long Term (HEAL) Initiative are conducting a pilot that will include development of a Coaching Extender Platform (CEP). CEP is an asynchronous communication approach that does not require live or synchronous communication between the coach and the site. CEP's objective is to provide an affordable way to extend

the coaching function and increase coaching effectiveness. The pilot has two study aims: 1) Design and develop the CEP prototype using user-based needs assessment and user-centered design strategies and Web application development best practices and 2) Conduct a six-month pilot with four jail settings to assess CEP's ability to increase targeted MOUD use and to understand the factors that promote or impede CEP implementation.

Introduction

The Centers for Disease Control (CDC) identifies overdose prevention as a national priority and expanding access to addiction treatment services as essential to responding to the opioid overdose epidemic.[3] Nearly 11 million individuals pass through local jails yearly,[4,5] 5 million people are on parole or probation,[6] and 1.5 million people are in state and federal prisons.[4] The Criminal Legal System (CLS) has a constitutionally driven responsibility to provide behavioral health care (i.e., mental health and substance use services) to this large concentration of U.S. adults with behavioral health needs; however, less than 10 percent of justice-involved individuals are able to access behavioral health services regardless of setting (jail, probation, etc.).[7-10] Among CLS populations, 66 percent have substance

use disorder (SUD),[3] 15 percent identify with lifetime opioid use,[3] and 11 percent are pain medication dependent.[3] These symptoms and use rates are dramatically elevated compared to those of the general population, resulting in unfavorable rates of overdoses,[11] suicide,[12-14] disabilities and physical disorders,[11,15,16] homelessness,[17] and death.[18,19]

The three most common medications for opioid use disorder (MOUD)—methadone, injectable naltrexone, and buprenorphine—have all proven to increase retention in treatment and decrease self-reported use of opioids, criminal activity, and mortality.[8] While pharmacotherapy holds excellent promise, medications are underused in SUD treatment, both in and out of the CLS.[20,21] Approximately 80 percent of those with opioid use disorder (OUD) do not receive appropriate treatment.[9,10] Use of MOUD among CLS populations is even lower,[22] with justice-referred patients being one-tenth as likely to receive agonist MOUD as other patients.[23] This inequity is particularly unwarranted as individuals in incarceration settings have direct access to health care, sometimes for the first time in their lives, and are ten times more likely to die because of an overdose post-incarceration.[24,25] Individuals in the state of New York receiving buprenorphine or

methadone treatment for OUD during incarceration were associated with an 80 percent reduction in overdose mortality risk for the first-month post-release.[26] However, despite the promise of MOUD, their rates of use have remained persistently low in CLS settings.[27,28]

Strategies are needed for increasing low MOUD rates in jail settings that can address the complexities of CLS health systems and resistant CLS personnel attitudes towards MOUD.[27] External coaching from someone independent of the organization has become a standard strategy for behavior and systems change[29-31] and has resulted in significant improvements in evidence-based practice implementation,[32,33] administrative functions,[31,34] clinical processes,[35,36] and systems of care.[37,38] Coaching is identified as an active ingredient in learning collaboratives and has been one of the more successful implementation strategies.[34] However, a significant deficit with coaching is its labor intensiveness for the coach, the organization, and the involved staff. In times of labor crisis, this becomes a substantial barrier and often makes this pivotal implementation strategy cost- and human resources-prohibitive. Accordingly, coaching techniques need to be designed for scaling up and affordability to maximize the full potential of the external coaching function. Moreover, greater clarity and consistency regarding what occurs within the coaching sessions is needed. This "black box" of coaching results in variation in practice and, consequently, in results overall. In a current trial conducted by this research team in jail settings through a Justice Community Opioid Innovation Network (JCOIN) initiative,[39] the promise and limitations of coaching became prominent, motivating the team to attempt to develop a coaching approach that could optimize the benefits of coaching while overcoming the strategy's limitations.

The Parent JCOIN Study

Researchers at the University of Wisconsin–Madison and George Mason University under the JCOIN initiative through the National Institutes of Health (NIH), Helping End Addiction Long Term (HEAL), are conducting an implementation effectiveness trial with 42 jails and community-based treatment provider organizations around the nation that are working to adopt, implement, or increase buprenorphine, methadone, and injectable naltrexone MOUD programming within their correctional setting.[5] The study "Fostering MOUD Use in Justice Populations" is in year four of a five-year study that began in January of 2021. The study is looking at two different implementation strategies, NIATx Coaching and ECHO, to determine the optimal approach for increasing the uptake of MOUD. NIATx coaches provide technical assistance in MOUD implementation and organizational change to assist justice and treatment organizations in implementing and disseminating MOUD for justice clients. ECHO focuses on the MOUD provider's knowledge and self-efficacy of MOUD care to increase confidence in using MOUD[40] through monthly telementoring sessions. Sites were randomly assigned to one of four study arms that compared low-dose NIATx Coaching (4 one-hour coach calls in one year) and high-dose NIATx Coaching (12 one-hour coach calls in one year) with and without ECHO. The study hypothesizes that sites assigned to the study arm, including high-dose NIATx coaching and ECHO, will be most successful in implementing or expanding MOUD use. The focus on implementation was on enhancing the MOUD Cascade of Care (CoC) of *screening*, *identification*, *referral*, *medication administration*, and *community transition*.

During the study, change team members were invited to participate in one-hour semi-structured qualitative interviews at the end of the intervention phase of the study to learn how coaching and ECHO (if applicable) impacted their site's MOUD programming at both the organizational and personal level and their experiences with receiving coaching and ECHO. These interviews provided great insight into the barriers and benefits of providing coaching strategies within a complex environment such as the criminal legal setting. One recurring theme that presented itself was an overwhelming request to communicate more with their assigned coach between coach calls and have a more asynchronous or timely communication method to ask questions, receive feedback, and keep each other informed of the process improvements happening within the site. The feedback led the research team to devise ways to bridge this communication gap and, ultimately, the beginning steps of designing a coaching platform that is structured, asynchronous, and digital to provide an affordable way to extend the coaching function and increase coaching effectiveness without increasing labor intensiveness.

The use of online technology through a laptop or tablet to expand access to and improve the coaching function will be developed and tested through the Coaching Extender Platform (CEP). The CEP will rely on online asynchronous communication and will initially be used with a limited amount of live coaching. The CEP and live coaching "hybrid model" will be designed as an implementation strategy that facilitates the application of other Expert Recommended Strategies for Implementing Change (ERIC),[41] such as conducting education sessions, identifying and preparing champions, developing and organizing quality monitoring systems, conducting cyclical tests of change, and audit and feedback.

Development and Assessment of the Coaching Extender Platform

The development and assessment of the CEP pilot has two aims: 1) Design and develop the CEP prototype using user-based needs assessment and user-centered design strategies and Web application development best practices, and 2) Conduct a six-month pilot with four jail settings to assess CEP's ability to increase targeted MOUD use and understand the factors that promote or impede CEP implementation.

Aim 1: Development of a Coaching Extender Platform Prototype

User-centered design (UCD) is a fundamental approach in software development that places the end users at the heart of the design and development process.[42] It is a methodology that prioritizes the needs, preferences, and feedback of users to create software that functions effectively and delivers superior user experience.[42] UCD recognizes that a successful software platform is one that aligns with the goals and requirements of its target audience. This approach involves a series of iterative stages that encompass understanding, designing, and evaluating the user's interactions with the software. By continuously involving users throughout the development lifecycle, UCD seeks to ensure that the resulting software is intuitive, efficient, and capable of meeting the users' specific needs. User personas, user journey maps, and wireframing are key practices within the UCD approach that play a pivotal role in crafting user-friendly software. Software products developed with these tools tend to result in higher user satisfaction and adoption rates[43] (Figure 1).

Creating User Personas

User personas are detailed profiles representing various segments of the target user base

that provide a valuable reference point during the design and development phases.[44,45] The user perspective helps teams empathize with users and make informed decisions related to software functionality and interface. Creating user personas is a methodical process that involves conducting comprehensive user research (e.g., through qualitative interviews) to gather data on demographics, behaviors, needs, and preferences. From this research, commonalities and patterns among users are identified and detailed persona profiles are crafted, giving each persona a representative identity, including information such as goals, challenges, and technological proficiency. These personas are then prioritized based on their relevance to the software's goals and shared with the development team to foster empathy for the target users and guide user-centered design decisions throughout the development process.

Journey Mapping

User journey mapping lays out the entire user experience, from the initial interaction with the software to the completion of user-intended tasks. This visualization aids in identifying and prioritizing user needs and expectations and helps anticipate potential points of friction in the user experience and opportunities for improvement.

FIGURE 1
User-Centered Design Process
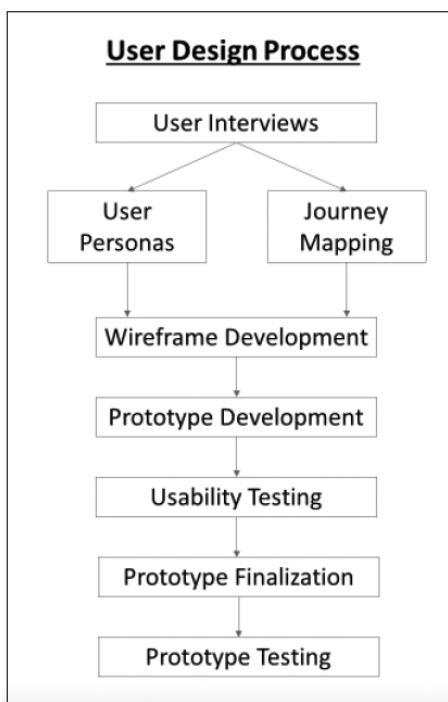
Wireframing

Wireframing involves creating skeletal outlines of the user interface, illustrating the layout and functionality of the software. It serves as a blueprint, facilitating early testing and validation of design concepts by the software development team. The wireframe is used to design the prototype.

Interviews with Target Users

The persona development and journey mapping methodology began with interviews designed to gain clinical and workflow-relevant insights from individuals working in the jails and providing MOUD coaching to the jails. This UCD approach collected data through a structured interview with four NIATx coaches with jail MOUD implementation experience and eight jail staff. Participants were asked questions about their beliefs, successes, challenges, and practices in promoting MOUD in jail settings and their past experiences using NIATx change methods. Example questions for jail staff included: What are your primary job responsibilities? Can you describe your typical day and the activities you perform? What are your main frustrations and pain points in your role of providing MOUD? How have you benefited from the live coaching sessions? What would be the goals of using a coaching platform? What are the top three functionalities you would look for in a coaching platform? Example questions for coaches included: What need(s) do you see filling for those you are coaching? What are your needs that you feel are unmet or underserved by live coaching sessions? Why and how might you use a web-based coaching platform? What would be your expectations and anticipated benefits of using a platform? What are the top 3 functionalities you would look for in a coaching platform?

Data from each participant was entered into a spreadsheet and aggregated separately for coaches and jail staff. A qualitative descriptive approach was used to aggregate and describe the participants' responses and to review the variation and commonality of responses.[46] Although the responses showed some differentiation between the groups, the two groups had consistent overall themes.

Interview Findings

From the interviews, three types of personas emerged and were the starting point for creating the CEP wireframe: 1) the *NIATx Coach*, 2) the *MOUD Executor* (nurse practitioner, physician, program manager, and/

or lieutenant/sergeant/sheriff responsible for the day-to-day MOUD program), and 3) the *Executive Champion* (medical or program director overseeing the MOUD programming and funding).

The research team compiled the qualitative findings into a matrix for each persona, including 1) barriers experienced in providing MOUD, 2) goals for using CEP to overcome barriers, and 3) desired outcomes. All three personas identified seven barriers to providing MOUD in a correctional setting, with the most prominent barrier being the lack of communication between staff at each level of the jail. (The CLS setting is a complex system with processes structured around standard operational procedures and guidance from multiple stakeholders—often with little direct correlation or communication between the two.) A close second was stigma associated with MOUD, not only from leadership and staff, but also from those incarcerated. A jail may have strong leadership support of MOUD, but if staff carrying out the program's day-to-day operations are not in support, the program fails. Similarly, if leadership is not in favor, regardless of staff receptiveness, the program will not succeed. Other barriers identified were limited staff bandwidth, inadequate funding to provide MOUD, lack of community treatment provider partnerships, and inefficient tracking and monitoring of the MOUD cascade of care (number screened, referred, administered medication, and referred to treatment post-release).

Following the identification of barriers, interviewees were asked what they would find helpful in the CEP that would assist in combating the barriers. For all three personas (NIATx Coach, MOUD Executor, & Executive Champion), responses were unanimous that having more asynchronous communication between the coach and site would be beneficial. The recurring message from the MOUD Executor and Executive Champion Personas was that the NIATx coach kept their site on track with process improvement projects, was a motivator and a sounding board for ideas, and validated their goals and missions. However, they felt they could have been more successful if communication with the coach had occurred more than monthly or quarterly during a scheduled coach call. The NIATx coaches echoed the same sentiment: if they had continuous updates on the jail's process improvement project(s) and were able to answer lingering questions or offer suggestions in a timely manner, they, too, would be

able to provide more effective coaching. All three personas also relayed that it would be useful to have one organized, central location to house agendas, task lists, process improvement charter forms, and MOUD data so that at any given time, either the coach or jail staff could get a quick status update on progress, pull reports from the MOUD data for yearly reports or funding applications, and/or review information that was discussed in prior communications, rather than searching through an email inbox.

The MOUD Executor and Executive Champion Personas presented a few other prominent themes. Interviewees suggested that it would be beneficial to interact with other jail staff/medical teams to discuss pertinent MOUD topics such as screening processes, medication administration protocols, and tactics for addressing stigma and diversion. Additionally, they indicated that it would be extremely helpful to learn about barriers other jails face and how they address those obstacles. Another theme was the need for more educational resources on MOUD (protocols, posters, papers, training/informational videos, and podcasts relating to MOUD) for staff and those incarcerated. Many jails are now mandated to provide one or more forms of MOUD but are not given adequate resources to easily implement or expand their programming. Providing resources that have worked with other jails can be a simple yet effective way to bridge the informational and skill development resource gap.

The NIATx Coaches shared one additional suggestion that was not raised by the others: an organizational needs assessment to be completed by the jail at baseline and throughout the coaching relationship to monitor progress. Coaches relayed that having a deeper understanding of the jail's organizational structure, the approach to implementing MOUD, and the barriers the site was encountering before coaching began would have allowed for more effective and efficient use of time in guiding the sites through their process improvement projects.

The information compiled through the interviews and User Persona development was then integrated into a user journey map that identified the software features to inform Wireframe development.

Creation of Wireframe and Prototype

Using the information compiled from the interviews, the team used a web-based design software to develop a wireframe (mock-up) of the CEP platform that was shared with developers. The wireframe included a mix of digital features that CHESS (Center for Health Enhancement & System Studies) platforms developed at the University of Wisconsin–Madison and that have previously been found beneficial in behavior change[47] along with new features and stylistic preferences generated from the qualitative interviews. It was determined that the alpha version of the CEP prototype would include the following features.

Project Management Center: Jail staff and coaches will use this feature to generate and store agendas and project charter forms, complete organizational needs assessments, manage tasks, and track progress towards implementation objectives. Both coaches and sites can view and comment on the information entered by the platform users. Automatic notifications will be built into this feature to notify the intended recipient(s) that information has been updated.

Cascade of Care (CoC) Performance Tracker: This feature will allow the jail to enter their CoC data (number screened, number referred, number of individuals administered medication, number of medication slots administered—buprenorphine, methadone, and naltrexone—and number of those referred to a community treatment provider postrelease) and view it in an easy-to-understand graphical format that will also compare their CoC performance to that of similar jails.

Communication Center: Two message boards will be available. The first board will be for the coach and site to communicate progress made in enhancing MOUD programming and elements of the CoC. Sites can ask coaches for advice at any time. The second board will be for sites to communicate with one another to pose questions or share resources. Automatic notifications will be built into both discussion boards to notify the intended recipient(s) that a message or response has been posted.

Resource Center: Resources will be made available to enhance each of the steps in the CoC and will include an instant library (information), such as peer-reviewed articles that support different CoC practices, personal stories (how others have made improvements to the CoC), common policies and operating procedures, podcasts and informational videos, handouts, and funding opportunities.

Skills Toolbox: This feature will provide tutorials on applying different organizational change tools, including improving system linkages between jail and community care settings. Role-specific tools will be available for the executive sponsor, change leader/site liaison, and project team members.

Usability Testing

This phase will focus on getting feedback on CEP's alpha version of the prototype before it is tested in the pilot. The platform will be shared with the study team, NIATx coaches, and jail staff participating in the qualitative interviews. The project coordinator will conduct usability walkthroughs with jail, coach, and study team users. They will be able to navigate around the platform and view the features of CEP and perform a set of common tasks. Subsequently, they will be asked to provide feedback on the functionality, ease of use, and perceived usefulness. The information gathered will then be shared with the development team to refine CEP before the pilot's launch.

Aim 2: Conduct a Six-Month Pilot

A six-month pilot with four jails will study CEP's effectiveness in expanding coaching access and impact and achieving improved and more consistent implementation results. Four jail sites interested in expanding MOUD CoC programming will be recruited for the pilot. The pilot will be a "hybrid" coach design, including the asynchronous CEP and low-dose live synchronous coaching.

Pilot Activities

The CEP pilot will follow a project-focused design that begins with a one-hour online orientation focused on how to use and benefit the most from the different CEP features. The sites will also participate in a two-hour kick-off meeting where they will meet their assigned NIATx coach and research team, receive training on the NIATx change model, review expectations and requirements of the pilot, and begin working with their coach to identify their site's first process improvement project focused on MOUD programming while using CEP. The change leader and change team at each site will work with their assigned NIATx coach on one or more process improvement projects focused on implementing or improving their MOUD programming with the use of the CEP and participate in two one-hour coach calls at three months and six months. Throughout the six months, the CEP will be available to team members, and the change leader will be asked to interact with the CEP on a weekly basis.

Pilot Study Evaluation Plan

We will employ a pre-post evaluation plan, with data being collected at baseline and M6. The primary outcome measure will be MOUD use via methadone, buprenorphine, and injectable naltrexone. Secondary outcome measures will be cascade of MOUD care infrastructure (via Jail Substance Use Treatment Services Inventory),[48] Staff Attitudes toward MOUD,[49] NIATx Fidelity,[50] and Workplace Stress.[51] At the conclusion of the pilot, qualitative interviews will be conducted to allow jail and coach participants to describe their personal experiences using the CEP and whether or not CEP helped alleviate the barriers discussed in the initial qualitative interviews, including lack of communication, limited access to resources, and not having access to a network of other jails providing MOUD. Interviews will include specific, closed-ended questions to examine whether/how the CEP was used, whether/how CEP usage changed over time, how CEP contributed to achieving study outcomes, and how the CEP integrated with the live coaching function. The qualitative results will be used to assess platform effectiveness, including factors promoting and undermining the success of CEP during the pilot, and to enhance the CEP for future applications.

Conclusion

The public health imperative of providing MOUD in incarceration settings, where infrastructure complexities and stigma towards MOUD persist, provides a challenging and opportune setting to test the CEP. The CEP pilot will provide researchers and the development team with the necessary information to gain initial insights into the utility of virtual coach supports and evaluation feedback on how to refine CEP for effective use on a larger scale. The CEP's intended purpose is to promote scaling up and affordability of coaching to maximize the full potential of the external coaching function to address the opioid crisis and other pressing public health issues.

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