

Feasibility and Acceptability of a Digital Health Intervention to Promote Continued Engagement in Medication for Opioid Use Disorder Following Release From Jail/Prison

Substance Abuse: Research and Treatment
Volume 16: 1–7
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DOI: 10.1177/11782218221127111



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ABSTRACT

BACKGROUND: Despite the extensive benefits of implementing Medications for Opioid Use Disorder (MOUD) in jail/prison, criminal justice-involved populations face significant challenges when transitioning back to the community following a period of incarceration. These risk factors are associated with increased drug use and discontinuation of evidence-based care. Novel intervention strategies are needed to support this high-risk period of transition. The primary objective of this protocol was to gather perspectives from the target population to optimize feasibility and acceptability of a combined in-person and text message-delivered intervention designed to support community reentry and continuation of MOUD.

METHODS: Participants (n = 8), who had prior experience engaging in MOUD while in jail/prison, were recruited from an outpatient primary care clinic in Rhode Island. A semi-structured interview was conducted to assess barriers/facilitators to technology following release, experiences of community reentry and OUD treatment, perceptions of continuum of care, and feasibility/acceptability of the intervention. All interviews were coded independently by 2 research assistants.

RESULTS: Participants reacted positively toward an intervention designed to support the transition to community-based care. Most participants denied any apprehension about using this type of platform. Obtaining a cell phone following release was endorsed as generally viable; however, special consideration must be paid to the consistency of cell phone service as well as digital literacy. Participants readily agreed on the utility of structured, daily text messages that provide motivational reminders and distress tolerance skill suggestions as well as the opportunity to access “on-demand” support.

CONCLUSION: Overall, individuals engaged in MOUD while in jail/prison were receptive to a motivational- and distress tolerance-based digital health intervention to support recovery. Incorporating thematic results on suggested structural changes may increase the usability of this intervention to promote continuation of MOUD following release from jail/prison.

KEYWORDS: Opioid use disorder, digital health, mHealth, criminal justice

RECEIVED: May 6, 2022. **ACCEPTED:** September 1, 2022.

TYPE: Original Research

FUNDING: The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Research reported in this publication was supported by the National Institute on Drug Abuse of the National Institutes of Health under Award Number K23DA046482. Drs. Ramsey and Langdon are all supported, in part by a National Institute of General Medical Studies Grant (P20 GM125507). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

DECLARATION OF CONFLICTING INTERESTS: The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Dr. Ramsey has an Investigator Sponsored Research Agreement with Gilead Science, Inc. for the provision of medication for another trial.

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Introduction

The overdose epidemic remains a critical public health emergency in the United States, with rates of opioid-involved fatal and non-fatal overdoses steadily rising.¹ The COVID-19 pandemic has further complicated this issue as rates of injection drug use have continued to rise.² Individuals with criminal justice (CJ)-involvement experience elevated rates of Opioid Use Disorder³ (OUD) and are at significantly higher risk of death from opioid overdose.⁴ In the United States, rates of

overdose deaths are 129 times higher during the period of time following release from prison/jail, with the greatest risk occurring within the first several weeks after re-entry into the community.⁵

To address this public health issue, there have been recent calls to increase access to Medications for Opioid Use Disorder (MOUD) in CJ settings, including expanding the use of these medications to jail/prison. MOUD is considered the standard of care for OUD and has been shown to be effective in



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lowering rates of mortality, illicit opioid use, HIV transmission, violent crime, and arrest.^{6,7} A growing body of literature suggests that there are extensive benefits to implementing MOUD in jail/prison.^{5,8,9} Indeed, data derived from the Rhode Island Department of Corrections, which successfully implemented a comprehensive MOUD program utilizing all 3 FDA-approved medications, demonstrated that initiation of MOUD while incarcerated is associated with a 60.5% reduction in post-release overdose deaths.⁷

While this work is promising, individuals reentering the community after a period of incarceration face several challenges in their transition, including poor social and family support, financial insecurity, income derived from drug sales, and inadequate housing.¹⁰ This context is characterized by frequent exposure to drug cues and an increased occurrence of stressful life events.¹⁰ A negative reinforcement model of substance use postulates individuals may attempt to cope with aversive internal states such as stress, anxiety, and/or depression through the use of drugs, including opioids.^{11,12} Other work suggests that emotional distress is prominent and linked to a variety of events (eg, drug cues/triggers, loss of social support/relationships, financial strain) during community reentry, and this emotional distress reliably induces drug craving.¹³ These factors are further compounded in the context of the COVID-19 pandemic.¹⁴ Thus, there is a critical need to develop innovative intervention strategies that: (a) promote motivation for continued engagement in MOUD following release from the highly structured CJ setting, and (b) teach adaptive strategies for coping with the stress associated with this high-risk period of transition back into the community.

Distress tolerance (DT), defined as the perceived or actual ability to handle aversive physical or emotional states, is a transdiagnostic vulnerability factor implicated in the development and maintenance of affective symptoms/disorders and substance use.^{13,15} DT is inversely related to a range of drug use outcomes, including frequency and severity of use,^{11,16} treatment dropout,¹⁷ and early lapse/return to use.^{17,18} There may be merit to directly targeting DT to increase the ability to tolerate stress, drug cues, and/or psychological discomfort that are associated with the transition back to the community following a period of incarceration.

Personalized feedback interventions such as decisional balance feedback, represent a promising method to effectively motivate engagement in and adherence to MOUD. Personalized feedback interventions involve an evaluation of the advantages/disadvantages of engaging in a certain behavior (eg, opioid use), compared to the advantages/disadvantages of an alternative behavior (eg, adherence to MOUD), and offer strategies for changing problematic behavior (eg, DT skills training).

Given that negative affect may primarily occur in the natural environment in response to drug cues or other psychosocial stressors, a tailored, mobile, DT intervention, that incorporates motivational enhancement, may have particular benefit for this

population. Therefore, this study sought to develop and refine, through formative evaluation, a combined in-person and text message-delivered intervention that aims to promote motivation for continued engagement in MOUD following release from jail/prison and teach adaptive strategies for coping with distress, by providing skills training and motivational reminders in “real-time.” The primary objective of this research protocol was to gather perspectives from the target population to optimize feasibility and acceptability of the intervention using thematic and content analysis.

Materials and Methods

Proposed intervention

The proposed intervention involves 2 delivery modes: in-person (clinician-delivered) and text message. The intervention initially targets motivational processes in combination with introductory strategies for managing stress, drug cues, and/or psychological distress through a brief, clinician-delivered, session that will occur in the 2 weeks prior to release. Following discharge, participants will receive 3 months of theoretically-informed text messages intended to enhance motivation and promote tolerance of distress.

In-Person: The initial intervention phase will be delivered in-person during the 2 weeks prior to release from incarceration. This portion of the intervention has 2 aims: (1) engage patients in a decisional balance exercise designed to evaluate the perceived advantages/disadvantages of continued behavior change (abstinence from opioids and continued engagement in MOUD) to enhance motivation; and (2) provide concrete strategies to better tolerate stress, drug cues, and/or psychological discomfort to persist with behavioral goals while transitioning back to the community. First, participants will be guided through a decisional balance exercise and asked about perceived barriers to community reentry and continued MOUD. Next, the information is summarized to deliver feedback about personal motivators and recommended distress tolerance coping skills. It is anticipated that the in-person portion of the intervention will be delivered by a trained, master’s level, counselor. Information obtained during the in-person intervention will be retained to inform the development of personalized text messages (see description below).

Text Message: The second intervention phase will be delivered via text message during the initial 3 months following release from incarceration and will focus on (a) promoting ongoing engagement in MOUD, and (b) emphasizing adaptive strategies for distress tolerance, drug cues, and/or psychological discomfort. Text message content will focus on emphasizing skills training (reminders of previously learned distress tolerance skills) and motivational messages (content directly derived from decisional balance exercise). The messages will be personalized in nature such that only the participant’s salient motivational factors and individual goals will appear in the content. Additionally, participants will be queried each day: (1) “How are you feeling

in general today?” and prompted to respond on a Likert scale, ranging from 1 to 5 (1 = really bad, 5 = great) and (2) “Any cravings or urges to use in the past 24 hours?” and prompted to respond with “yes” or “no.” Immediately following the response, participants will receive a tailored DT skill recommendation, which will be selected from the participant-generated pool and tied to the participant’s mood/craving assessment.

Recruitment

Participants were recruited from a hospital-affiliated outpatient clinic that provides primary care and ancillary support services for patients recently discharged from the Rhode Island Department of Corrections. Patients were eligible to participate if they were over 18 years of age; had a history of DSM-5 Opioid Use Disorder; were currently engaged in MOUD; and had experience taking MOUD while in jail or prison. Exclusion criteria included: not fluent in English; limited mental capacity or inability to provide informed written consent. Participants were recruited through referral from treating providers during routine clinic visits. Demographic and clinical data were obtained following written and informed consent. Participants were compensated with a \$30 gift card for their time/effort. This study was reviewed and approved by the Lifespan Hospital Institutional Review Board, Protocol #1340229.

Interviews

Qualitative in-depth individual interviews were conducted by trained Clinical Research Assistants (CS, PJ). To maintain participant privacy, the interviews were conducted either in a reserved office space or via videoconferencing. The interviewers followed a semi-structured interview guide, developed from project aims. Participants were prompted about their use of computers, mobile phones, and other technology; history engaging in MOUD; barriers/facilitators to MOUD—while in jail/prison and following release; precipitating factors to using substances; feedback and perspectives surrounding utility and delivery mode of proposed intervention; and perceived advantages and prospective usability of digital health interventions. Samples of the intervention components, including a mockup computer presentation and representative text messages, were presented to participants for preference testing in an A versus B format. All interviews were audio-recorded, transcribed by a professional agency, and checked for accuracy prior to coding. A written debrief of each interview was also completed by the interviewer and reviewed by the team members.

Data analysis

All interview transcripts were read and manually coded by AB and PJ. Analyses used both thematic (deductive) and data driven (inductive) codes. Deductive codes were drawn from the content interview questions directly assessed and inductive

codes captured any spontaneous, emergent themes from participant responses. AB and PJ collapsed recorded data into a framework matrix to easily track and identify prevalent feedback and developing concepts.¹⁹⁻²¹ AB and PJ periodically examined the framework matrix and modified intervention content and interview questions as appropriate, allowing for quick, iterative turnaround of participant feedback.

After each interview, the coding structure was iteratively refined; amendments and notes for analysis were documented in a collaborative audit trail. After 8 interviews, data saturation was achieved and it was concluded that no additional concepts emerged, within the boundaries of the primary project aims. Once the coding structure was created, each transcript was independently coded by AB and PJ. The Principal Investigator (KJL) was consulted to reach consensus about agreed upon codes and the 2 individual framework matrices were consolidated. The findings presented in this manuscript derive from project team discussions on relevant, reoccurring themes in the coding framework. A similar data analytic process has been used successfully in prior studies by the Principal Investigator.²² The study protocol was approved by the Lifespan Institutional Review Board (ID: 1340229).

Results

Of the 8 participants who provided study consent, 8 completed interviews. The sample was predominately male (87.5%), with an average age of 47.4 years (SD = 11.29). Participants primarily identified as White (75%) and Non-Hispanic/Latinx (2%). In terms of experiences with MOUD, 50% initiated medication while in jail/prison, while the other 50% had been on medication prior to the most recent arrest. Most of the sample was currently taking Methadone (75%); 25% were taking buprenorphine. All participants (n = 8) were on probation at the time of the interviews. See Table 1 for a complete profile of participant characteristics.

Themes

Themes are presented by the 2 primary goals of the analysis: to elucidate (1) acceptability, feasibility, and perceived utility and (2) structure of a digital health intervention for individuals engaged in MOUD while in jail/prison. See Table 2 for examples of illustrative quotes pertaining to the primary themes.

Acceptability and feasibility

Theme A1: Individuals engaged in MOUD while in jail/prison are receptive to a motivational- and distress tolerance-based digital health intervention. Most interviewed participants reported enthusiasm about a digital health intervention to support the transition to community-based care. Interviewees were receptive to the proposed skills and believed that the strategies could help individuals overcome challenges with recovery following release, such as ambivalence around treatment goals: “I like it

Table 1. Participant demographics (N=8).

	N (%)
Age (mean)	47.4
18-35	0 (0)
36-50	5 (62.5)
51-65	3 (37.5)
Gender	
Male	7 (87.5)
Female	1 (12.5)*
Current OUD medication	
Methadone	6 (75)
Suboxone	2 (25)
Started medication	
While in jail/prison	4 (50)
Prior to most recent arrest	4 (50)
Ethnicity	
Hispanic/Latino	2 (25)
Non-Hispanic/Latino	6 (75)
Race	
White	6 (75)
More than 1 race	1 (12.5)
Black or African American	1 (12.5)
American Indian or Alaska Native	0 (0)
Other	0 (0)
Relationship	
Single and never married	2 (25)
Dating or seeing someone	2 (25)
Live with spouse/partner	3 (37.5)
Married	0 (0)
Divorced or widowed	1 (12.5)
Education	
Finished high school or received GED	4 (50)
Some college	2 (25)
Trade/tech school	1 (12.5)
College/university degree or higher	1 (12.5)

because it gets somebody to think about what they want to do. . .it's getting their mind into making a decision" (participant 2). The perceived support and structure offered through daily text messaging was especially attractive, particularly the sense of having continuous accountability: "I think this is

gonna help a lot of people. I like it. Personally, it would help me. Just having somebody watching out for me every day, daily, would help me" (participant 1). Participants commented on the utility of receiving motivational and coping skill reminders each day to reinforce their goals for recovery, citing that the motivational reminders, in particular, cultivated a sense of positivity: "all in all, I think it's really good situation, really good thing with the text messages. They're all positive. They all give some positive affirmations for the person" (participant 2).

Theme A2: Privacy is not a concern for text messaged-based interventions. When asked about potential concerns related to their privacy and text messaging, most participants denied any apprehension about using this platform. One participant emphasized that the information should not be shared with anyone, including the police (participant 3), while another participant suggested that all names be removed from messaging to maximize privacy (participant 8). However, privacy concerns were not viewed as a deterrent to engaging in the program.

Theme A3: Obtaining a cell phone following release is generally viable; however, special consideration must be paid to the consistency of cell phone service as well as digital health literacy. Five of the interviewees reported that they were able to attain a cell phone immediately following release from jail/prison. Three participants described difficulty with cell phone access, largely due to financial strain. Notably, almost all the sample (n = 7) described significant challenges to maintaining steady cell phone service, explaining that they frequently ran out of data/service due to the inability to pay the cell phone bill. Participants who had experienced longer periods of incarceration endorsed difficulty becoming competent with cell phone technology following release (n = 4).

Structure

Theme B1: The text message intervention should include both automatic and on-demand messages. Participants expressed support of a standard schedule of text messages that provides a motivational reminder and distress tolerance skill suggestion. Interviewees described a desire to receive multiple messages per day, generally once in the morning and once at night. Several participants noted that a "custom" schedule, one that reflects their specific needs (eg, work routine, high risk periods of time), would be most beneficial. Most participants expressed enthusiasm about the availability of additional support on an "as needed" basis by texting key words. However, one participant preferred to receive the messages on a schedule only, explaining that it might become challenging to remember the different options.

Theme B2: Initial intervention should be delivered prior to release. Universally, participants agreed that the initial (in-person) intervention content should be delivered during a period of incarceration. Participants reflected on the utility of

Table 2. Illustrative quotes pertaining to primary themes.

A. Feasibility and acceptability	
A1. Receptivity to intervention	<p>ID 5: I like whoever worded all of this because they're not putting a bunch of bullshit in here. They're actually just putting right to the point sentences and phrases and words.</p> <p>ID 4: It's good to hear somebody else's feedback. . . We all got different ways of coping and dealing with our addictions.</p>
A2. No concerns about privacy	<p>ID 3: No [concerns]. It's not invasive because you can shut it off anytime you want. . . If it was invasive, yeah. If you would share my information with police and all that stuff, yeah. But you're tryin' to help.</p> <p>ID 7: No [concerns]. I would like to maintain privacy because of HIPAA.</p>
A3. Access to cell phones, cell service, and digital literacy	<p><i>Interviewer:</i> Okay, and how easy or difficult was it to obtain a cell phone following release from prison?</p> <p>ID3: Very hard. I came out with no money. I was homeless. Took me a while. Took a long while—about 6 month—to get my own. . . it's been shut off a few times, unfortunately. I don't have a job, per se. I hustle. Sometimes, I don't have the money for it. Well, I would get it, but sometimes it's a couple days late. I have that pay-as-you-go thing, not a monthly plan.</p> <p>ID7: Oh, yeah, a long time. It took me like 6 month to really affiliate the thought process on how the cell phone worked, email, backdrop, notes, or things like that</p>
B. Structure	
B1. Mix of scheduled and on demand messages	<p>ID 6: I think at least twice in the morning and the afternoon. . . In the morning definitely is more vital, so at least you can get them to start thinking right away.</p> <p>ID 4: Yeah, [I'd want messages] especially on Fridays. Friday when people get payday. . . they wanna go get their high. . . it helps out if you got somebody on the other side tryin' to get in touch with you to help you out with your cravings or urges.</p> <p>ID 1: I like the idea [about on demand messages], but I think it just needs to be if you're feeling bad, just text it.</p> <p>ID 3: Set schedule "cause my life is hectic. . . Demand messages is requirin" me to reach out and ask. . . whereas, I think the other way's better because then—sometimes I'm not gonna sit there and reach out, and I'm just gonna stay stuck in myself.</p>
B2. Preference to initiate intervention prior to release	<p>ID 6: I would let it [intervention] sit there while they reflect more on their life to see how serious they are, and you get them to that full, attentive state of mind for it to soak in on them. . . so they'll have at least a good month already inside or something like that where they get the anger of being in jail and. . . they start looking at the reality of it.</p> <p>ID 5: You're plottin' and planning the party, the drinking, the women, the freedom. If you could get this into somebody's head. . . it could really save somebody.</p>

incorporating this intervention into their discharge plans to help prepare for future obstacles: "You're plottin' and planning the party, the drinking, the women, the freedom. If you could get this into somebody's head. . . it could really save somebody" (participant 5). Half of participants emphasized the importance of receiving the intervention at 2 time points—(1) upon entry into jail/prison; and (2) in the weeks leading up to release—to maximize learning and capitalize on readiness to change substance use.

Discussion

The present study introduces novel qualitative data that demonstrates preferences for structure and feasibility/acceptability elements of a combined in-person- and text message-delivered intervention for individuals engaged in MOUD during a period of incarceration. This study supports that those with OUD, who are preparing for release from jail/prison, may be receptive to a digital health tool designed to enhance motivation for recovery and improve the ability to cope with distress.

This program was largely viewed as a highly accessible, supportive and useful tool to overcome some challenges that arise when transitioning back to the community following a period of incarceration. This is especially noteworthy as structural and drug use pattern changes resulting from the COVID-19 pandemic have led to increased substance use and greater risk for overdose, underscoring the need for additional tools to support recovery during the already high-risk period of community reentry.²³ However, several challenges were described in terms of accessing and maintaining technology following release (see expanded discussion below).

We proposed a 2-part intervention that would initially be delivered by a clinician prior to release from jail/prison, followed by 3 months of daily text messages once in the community. Participants emphasized the benefits of beginning the intervention while in jail/prison to enhance motivation for recovery from OUD and address anticipated barriers to community reentry. Participants described 2 ideal timepoints to deliver the initial phase of the intervention: (1) upon entering

jail/prison; and (2) in the weeks leading up to discharge. Delivering the intervention at these timepoints will help to facilitate behavior change by capitalizing on “moments” when individuals are ready to receive this information.

In terms of the text message portion of the intervention, participants were enthusiastic about the ability to receive daily text messages that focus on providing motivational reminders as well as distress tolerance skills suggestions. Participants liked the predictability and structure of receiving predetermined daily messages that would not necessarily rely on the participant to initiate the interaction. However, the availability of on demand messages that could be accessed 24/7 was perceived to be highly supportive and responsive to personalized needs. For example, participants reflected on the nature of drug use, emphasizing that urges/cravings for opioids or other drugs may occur at non-traditional times, requiring the need for continuous “real-time” support. Thus, participants were receptive to the text message program that delivered automated daily messages with the opportunity to access additional tips on an as needed basis.

Another overarching theme that emerged from our data was technology-related barriers that have historically been experienced by individuals with CJ involvement. Specifically, a large portion of the sample described challenges to maintaining steady cell phone service as well as difficulty with digital health literacy. The COVID-19 pandemic provided a unique opportunity for telehealth uptake, with recent reports demonstrating high utilization of video and telephonic platforms for the delivery of substance use treatment services.²⁴ However, there remains apprehension to prescribe MOUDs via telehealth platforms, particularly telephonic services, potentially limiting access to lifesaving treatments among the CJ-involved population.^{24,25} These barriers suggest that although technology-delivered interventions may improve access to support and skills for some participants, not all will be able to take advantage of these benefits. To improve feasibility of implementing digital health interventions for this population, future work may need to consider such technology-related barriers by supplying cell phones with video capabilities and data plans as well as providing education to promote baseline digital literacy.

There are several limitations worth noting from the current study. First, the current study is comprised of a small sample size ($n=8$) in which participants were recruited exclusively from 1 outpatient clinic potentially limiting generalizability. Research suggests that it is possible to achieve saturation with a sample size of 7 to 10 participants²⁶ and while we did reach saturation in our sample, it is possible that a different pattern of findings may emerge with a larger sample size that was recruited from more diverse settings. Second, we attempted to recruit participants with varying gender and race/ethnicity; however, our sample is primarily comprised of white, non-Hispanic, men. There may be important cultural and gender-related differences that may influence the structure and acceptability of the intervention. This study only included

English-speaking participants. Greater inclusion of other races/ethnicities and non-English-speaking populations should be a priority of future research.

The present qualitative analysis provides beneficial insight into the structure and acceptability of a combined in-person and text message-delivered intervention for individuals engaged in MOUD during a period of incarceration. Although participants were largely supportive about the content and delivery of the intervention, significant concerns were raised about the ability to access consistent cell phone service following release from jail/prison. While there are many benefits to technology-delivered interventions (eg, improved access, scalability, tailored content, and delivery mode for individuals working on recovery from substance use), research must account for possible logistical and financial barriers encountered by the CJ-involved population to promote feasibility and utility of digital health.

Acknowledgements

The authors acknowledge the Qualitative Science and Methods Training Program (QSMTP) of the Department of Psychiatry and Human Behavior, Warren Alpert Medical School of Brown University, which provided training in qualitative research methods for this manuscript.

Author Contributions

KJL: Conceptualization of Study, Data Analysis, Writing – Original Draft, PJM: Writing – Original Draft, AB: Writing – Original Draft, CS: Writing– Review and Editing, SR: Conceptualization of Study, Writing – Review and Editing.

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