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A qualitative exploration of patients' experience of mobile telephone-delivered contingency management to promote adherence to supervised methadone

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Abstract

Introduction: Despite an increasing evidence base for mobile telephone-delivered contingency management (mCM), there had been no previous qualitative exploration of patients' experience of receiving mCM and the factors that might influence that experience and outcome in a UK setting. The aim of this study was to understand patients' views and experience of receiving mCM by exploring their beliefs, expectations and perceived benefits within the context of the UK's first mCM intervention.

Methods: Qualitative interviews ($N = 15$) were conducted with patients undergoing opioid agonist treatment in a UK drug treatment service and receiving mCM to encourage adherence with supervised methadone as part of an existing study. Interviews were conducted at two time points and analysed using Framework to explore patients' expectations and beliefs during the early stage of the intervention (2 weeks) and their perceived benefits and experience at the end of the intervention (12 weeks).

Results: The mCM was perceived as a motivator, providing validation of achievement, and involving discreet and positive interactions. Perceived benefits included enhanced methadone adherence, reduced drug use and the development of a supportive and non-judgemental connection that resembled a therapeutic alliance.

Discussion and Conclusions: The mechanisms underpinning contingency management appeared to operate in the absence of human interaction, and the mCM intervention was deemed to be meaningful, acceptable and well received by patients. These findings not only provide support for the application of mCM in this context but also offer insight into the factors that influence outcomes and should be considered in the development of future mCM interventions.

KEYWORDS
contingency management, opioid agonist treatment, opioids, remote delivery

1 | INTRODUCTION

Contingency management (CM) is a form of behavioural therapy that involves the systematic application of positive reinforcement (e.g., financial incentives) to promote behaviour change. CM interventions are based on the theory of operant conditioning, which posits that a behaviour that is reinforced will increase in frequency. CM has a well-established research evidence-base demonstrating its effectiveness in promoting substance use related health behaviours, such as abstinence from opiates, cocaine, cannabis, tobacco and alcohol [1–5]; medication compliance [6–8]; adherence to hepatitis B vaccinations [9]; and attendance at clinical appointments [2, 10–13].

CM has a growing research evidence base which highlights the promising role that technology may play in enhancing the reach of these interventions and surmounting some of the barriers to dissemination [14]. Technology enables the monitoring of behaviours that occur outside a clinical setting, making it feasible to target behaviours such as adherence to opiate agonist treatment (OAT) in community pharmacies [15]. Although still in its infancy, a meta-analysis demonstrated mobile telephone-delivered CM (mCM) was more effective than no CM in promoting alcohol and nicotine abstinence [16]. While little research has been undertaken using mCM targeted at illicit substances, one study found mCM to significantly enhance attendance at counselling appointments, adherence to OAT and opioid negative urine samples among those with opioid use disorder [17].

The use of technology to monitor behaviour and deliver incentives remotely has been deemed appropriate and acceptable by patients surveyed in UK drug clinics, with 81% in favour of CM programs [18]. Engagement and compliance with remote behavioural monitoring procedures have been satisfactory, with many patients in receipt of mCM reporting the technology to be easy and straightforward to use [19–24]. Research exploring patients' experience of remote CM is largely dominated by the United States, and despite an increasing evidence base for mCM, there has been no previous qualitative exploration of patients' experience of receiving mCM and the factors that might influence that experience and outcome in a UK setting. However, qualitative explorations of traditional, face-to-face CM help us to understand how these interventions are perceived in real-world contexts and highlight perceived positive outcomes among patients receiving treatment for opioid use disorder [25].

Another potentially critical factor at play might be the presence or absence of the ability to develop a therapeutic alliance. Technology-based interventions present a challenge to the importance of the therapeutic alliance, as these interventions are typically delivered without the presence of the health-care provider or therapist [26]. Despite much emphasis placed on the importance of this relationship between a treatment provider and client [27, 28], researchers have argued that the therapeutic alliance may be a less robust predictor of outcomes when interventions are delivered remotely and the role of the treatment provider is minimal or absent [29, 30]. An individual's ability to establish some form of therapeutic alliance, when in receipt of mCM remains unknown. Whether such a therapeutic alliance can be formed, and how it might influence treatment outcomes, needs to be established.

While mobile technologies could offer a more feasible way of delivering these effective interventions, it is imperative to understand and consider patients' views of mCM and how they interact with these interventions. Such findings are important for the development of future mCM interventions. Exploring and understanding patients' response to mCM requires a multi-faceted approach: ascertaining not only their views on CM but also the specific modality with which it is delivered. This qualitative study aims to understand patients' views and experience of receiving mCM by exploring their beliefs, expectations and perceived benefits within the context of what we believe is the first mCM intervention used in UK drug treatment services.

2 | METHODS

A qualitative study was undertaken to explore views and experiences of mCM among patients attending a drug treatment service and receiving mCM as part of a clinical trial. Semi-structured interviews were carried out at two time points to provide a longitudinal perspective.

2.1 | Participants

Participants were patients with opioid use disorder attending a UK drug treatment service and receiving daily methadone under a community pharmacist's supervision. Methadone is provided free-of-charge by the National Health Service (NHS). In the early stages of OAT, the supervised consumption of methadone is recommended to improve adherence, safeguard against overdose and prevent potential for diversion onto the illicit market. Patients are typically maintained on supervised consumption until they have demonstrated a period of treatment compliance and abstinence from, or significant change in, illicit opioid use [31].

Participants were receiving mCM as part of an existing study examining the feasibility of undertaking a future confirmatory trial of the effectiveness of mobile telephone-delivered incentives to encourage adherence with

supervised consumption of methadone (TIES: described elsewhere [23]; trial registration ISRCTN58958179). As part of the TIES study, a novel mCM intervention was developed and tested to monitor participant's attendance at their community pharmacy and consumption of methadone under supervision. To do this, two small studies were conducted to develop and test the mCM (stage 1) and assess feasibility (stage 2). A purposive sampling method was employed, whereby participants receiving mCM during stage 1 or 2 of the TIES study were invited to participate.

2.2 | Study setting

The TIES study used a cluster randomised trial design where London-based treatment services were randomised to one of three trial arms. This qualitative study was undertaken in the treatment service that was assigned to the mCM arm of the TIES study. The clinic is managed by the South London & Maudsley (SLaM) NHS Foundation Trust who provide the widest range of NHS mental health services in the United Kingdom, offering specialist in-clinic and outpatient services to help patients with substance use disorder in reducing or stopping their use and minimising the associated harm.

2.3 | Exposure to mCM

Participants in the mCM treatment arm of TIES received daily positive reinforcement (financial reward of 50p and a text message of praise) delivered to their mobile telephone immediately after they attended their community pharmacy and consumed their oral methadone under the supervision of the pharmacist. If they attended 6 days consecutively, they earned a bonus reward of £5. The total possible financial reward was therefore £8/week or £96 over 12 weeks. At the end of each week, financial incentives were electronically loaded onto a study debit card provided to the participant by the research team. If, however, the participant did not attend their pharmacy to take their medication, they did not earn the incentive and received a neutral message later that day informing them that they can still earn an incentive if they attend their pharmacy and receive their medication the following day. Additionally, the mCM software automatically provided weekly medication adherence reports to prescribers, and an early warning of missed doses, to help prescribers provide informed and responsive treatment.

The mCM intervention was delivered over a 12-week period. The internet-based software enabled participants to record their attendance at their pharmacy using an electronic tablet once they had consumed their supervised dose and the intelligent text message service automatically and immediately provided participants with praise and notification of their monetary reward. A bank of praise messages was developed by the research team, programmed for personalisation, and delivered in rotation. Each message included the participant's nickname and was signed off by 'Alex'. For example, 'Great you managed to attend and take your dose today <nickname>, that's 50p for you! Continue to work towards your £5 bonus by attending and taking your dose again. See you soon, Alex'.

2.4 | Study procedures

The TIES study participants were recruited to the qualitative study at two different time points. Participants involved in stage 1 of the TIES study were invited to participate in the qualitative study upon completion of the development work. Participants involved in stage 2 were recruited during the TIES baseline assessment. The TIES researcher informed participants about the qualitative study, provided them with the Participant Information Sheet, and obtained informed consent. Consenting participants were contacted by the qualitative researcher who arranged an appointment to carry out the interviews. Interviews were conducted in a private consultation room within the drug and alcohol service.

2.5 | Data collection

Semi-structured interviews were conducted at two time points (2 and 12 weeks) to gain a longitudinal insight into participants' experience of receiving the mCM intervention (see Table S1, Supporting Information, for interview structure). The evolving nature of relationships and the time taken to establish a therapeutic alliance required this longitudinal perspective. Conducting interviews at two time points also provided a unique opportunity to explore participants' expectations and beliefs during the relatively early stage of the intervention (2 weeks: T1) and participants' perceived benefits and experience at the end of the intervention (12 weeks: T2). The interviews explored a number of a-priori topics based on the research questions, existing literature and the theoretical frameworks of CM and therapeutic alliance. More specifically, topics included: methadone treatment and previous treatment episodes; perspectives on CM; experience of the mCM intervention; perceived mCM outcomes and the establishment of a therapeutic alliance with the mCM intervention. Interviews were audio recorded using the Olympus DS-9500 Digital Voice Recorder and transcribed verbatim. Interviews were conducted in person

and lasted on average 36 min (range: 20:52–62:42). Participants were reimbursed £10 for each interview.

2.6 | Data coding and analysis

The analytical method used for this study was Framework [32]. The analytical framework was used longitudinally in a trajectory-based approach to explore and understand experiences as they relate with outcomes. The framework matrix output enabled us to contextually compare data across participants, themes and time. Data coding and analyses were undertaken in stages. Interviews were transcribed verbatim using a denaturalised transcription approach, focusing on informational content. Using NVivo, each transcript was reviewed line by line, identifying key issues or concepts and grouping them together into coding folders. A-priori conceptual codes, based on previous literature and the theoretical framework of CM, facilitated a clear progression from the research aims to the study conclusions. Inductive codes were added as additional themes or issues emerged in the data. The systematic technique, iterative categorisation [33], was followed to ensure data were analysed in a rigorous and transparent way. Using iterative categorisation, data from each code was exported from NVivo into a Word document and organised iteratively under emergent headings and subheadings. To maintain consistency across coding, a simple coding frame was used that illustrated substantive codes grouped together under general themes.

Framework created a new illustration for the themes identified in the previous stage. Using Framework analysis methodology, a matrix for each participant was created, with themes organised along the *Y*-axis and time along the *X*-axis. Data were summarised and presented under each theme. A final matrix was created to explore and summarise how experiences changed or did not change over time. To organise the findings, the *Y*-axis was again organised by the themes, while the *X*-axis was organised according to participant.

Research ethical approval was granted by London South-East Research Ethics Committee (REC reference: 18/LO/1722).

3 | RESULTS

3.1 | Participant characteristics

Ten participants consented to the study, however, one stopped engaging with their treatment and became uncontactable. Therefore, interviews ($N = 15$) were conducted with nine participants. Three participants consented after T1 interviews (due to one being uncontactable and two being involved in the development phase). Therefore, six interviews were conducted at T1, while nine interviews were conducted at T2. All participants ($N = 9$) were male with ages ranging from 32 to 61 years old ($M = 38.96$, SD = 9.17). Most of the participants were white ($N = 7$) and a small majority were homeless (e.g., reported no fixed abode) ($N = 5$).

3.2 | Qualitative findings

Four primary themes were identified to explain participants' experience of mCM and whether it brought about behaviour change: principles of CM, remote CM, perceived outcomes and therapeutic alliance. These themes are presented along with the emergent secondary themes. Where applicable, the findings provide a longitudinal perspective of how participants' experiences changed and a therapeutic relationship evolved over the course of the intervention.

3.3 | Principles of contingency management

3.3.1 | Money was a motivator

Adhering to daily supervised methadone consumption was described by patients as a commitment, and sometimes they missed doses due to lacking the motivation to attend the pharmacy. The influence of the positive reinforcement (financial incentives and praise) was sometimes described in clear terms, with participants reporting it encouraged compliance with their methadone when they lacked self-motivation. Some participants' discussed their financial hardship, through homelessness, unemployment and in some cases the lack of government benefit support. They reported how incentives, regardless of magnitude, were important and beneficial to enable them to purchase food when they did not have much money.

While the importance of the incentive was echoed across both time points, several participants expressed concern at T1 that the incentive might encourage them or others to acquire drugs. However, no participants indicated using the incentive in this manner at T2. The incentives appeared to act as intended: to encourage adherence to supervised methadone. One participant described at T1 their expectations and positive experiences thus far, and reiterated the perceived benefits of the mCM intervention at T2:

> '*It will help me get the maintenance, yeah, definitely … it's going to help me, the issue*

regarding that sometimes I just stop going. But because of the text messages, and because of this money, yeah, it helps me a lot'. (P04;T1)

'*It was definitely a game changer. Especially my situation nowadays … so it's £10, £5, 50p, everything counts, do you know what I mean? Every little helps*'. (P04;T2)

3.3.2 | The value of the incentive

Participants defined the incentive as money they had earned, comparing it directly to money they could acquire through socially undesirable or illegal activities, such as begging or selling drugs. Having to work hard to obtain the incentive impacted upon the value and meaning placed on it, which in turn made patients consider how this money was spent. At T2, the financial security the incentive provided was apparent for some patients, providing them with reassurance that they had the means to purchase a meal or a travel pass when required.

'Like I remember when I used to do criminally, I used to spend it … But when you go to work and make your money on a proper manner, it's different, you spend the money differently, because you've earned it … There's a difference between making money and earning money. And I feel like I earned it [incentive]'. (P04;T2)

3.3.3 | Someone cares

For some patients, a significant impact of the praise messages was the feeling that someone was thinking about them and their treatment. Participants expressed how the messages felt supportive in helping them to adhere to their treatment goals. Participants also expressed how the content of the messages was appropriate and positive, and discussed the importance of messages being personalised. This sense of care and compassion was described during the early interviews and continued to be prominent throughout the duration of the intervention.

'*It's like someone is looking over, someone is caring for you. It is personal, like someone saying thank you, you have done something well*'. (P03;T1)

'*It was great … it was like someone on the other end of the line looking after your welfare, how you're doing, and telling you keep up the good work*'. (P03;T2)

3.3.4 | Validation of achievement

A prominent theme was the validation provided by the praise messages. This appeared to be two-fold. First, the messages acted as important verification to the patient, giving them a confidence boost as they felt proud about accomplishing their daily goal. Patients described that they felt the messages congratulated and thanked them for attending their pharmacy and consuming their methadone. Although patients acknowledged the importance of this behaviour for their treatment, the messages signified the impact of this for their long-term treatment journey, making it feel like an accomplishment. While not all patients found this validation essential, they described how it helped them to believe in themselves.

'Yeah praise, and they are saying aw thank you for doing that. And at least someone is saying, good chap, he is doing good, you know what I'm saying. I guess, someone giving you praise like go on, keep up the good work'. (P03;T1)

Second, patients found the messages acted as important verification to others involved in their treatment, including the clinical team, research team and their family. The mCM software automatically provided medication adherence reports to prescribers and notified them of missed doses. For most patients, it was important for them to receive the praise messages immediately after logging their attendance as it indicated that the team knew they had been and taken their methadone. For some, these messages verified their attendance and achievement to their family. This is key when at times they feel like they are burdening family and others around them with problems and issues associated with their drug use behaviours.

'*I know if I don't go, my mum's going to see the text, so I wanted her to know that I'm doing the best to make myself a better person and to help myself*'. (P04;T2)

3.4 | Remote contingency management

3.4.1 | Positive interactions

While no participants had experienced CM previously, they responded to hypothetical questions about receiving

positive reinforcement in a more conventional face-to-face setting. Although a small number of participants suggested that receiving face-to-face CM would facilitate conversation and engagement, they believed these interactions would only be positive if they were with someone who they already had a relationship with. Participants believed that receiving incentives remotely was sufficient to encourage behaviour change and served the purpose of acknowledging their attendance and encouraging their adherence. Patients raised several concerns regarding face-to-face delivery approaches, describing how a simple interaction could become complicated by factors such as the treatment provider's personality and whether a good or poor therapeutic relationship is established. For some, daily praise could become patronising or disingenuous, making the interaction uncomfortable and in turn have a negative impact on their adherence.

> '*I don't know, it depends how good the relationship with the person … but then there might be something wrong between us, or I'm not going to take my medication just because I'm going to see her*'. (P04;T1)

3.4.2 | Discreet

An important feature of technology-based reinforcement is the discreetness of this process. For some patients, they appreciated the privacy and liked that no-one outside of their treatment knew they were involved in the intervention or receiving the CM treatment to encourage their methadone adherence.

> '*Because this is still not an acceptable thing in society. Is it? No. They look at you like junkie, they look at you like lesser human. It's not acceptable*'. (P08;T2)

3.5 | Perceived outcomes

3.5.1 | Enhanced methadone adherence

At T1, while all patients expressed a desire to achieve daily adherence to their supervised methadone, many believed they could achieve this through self-motivation and the incentive would not be the reason why they attend. Indeed, for some, this perspective remained during T2. However, T2 presented a conflicting scenario, whereby many patients expressed being pleasantly surprised about how important the praise messages became. Some patients indicated their attendance might have been less consistent if they had not received the mCM. All patients reported how their current treatment was more stable than previous episodes, with either no or few missed doses, and believed the benefits were due to the CM. For example, one patient described how the incentive would not have an impact on their adherence to their methadone at T1, however, described the profound benefits of the CM at T2:

> '*No, I would still be going anyway because I need my methadone. It's just a bonus, it's just a nice, another incentive to collect it basically*'. (P05;T1)

> '*I mean if there wasn't any of that with the reward and the text messages, who knows what the outcome would be. May be totally different, I may not even be on a script now, who knows*'. (P05;T2)

3.5.2 | Reduced drug use

Within-case comparisons across the two time points suggests the mCM played an important role in encouraging daily adherence to their methadone treatment. Some patients explained how this enhanced stability had a subsequent effect on their drug use as adherence to their daily methadone dose reduced their withdrawals and need to use heroin. While this effect was reported by only one patient at T1, the majority reported a change in their drug use at T2.

> '*I smoked less and less* [heroin]. *Honestly. Because I was going to the pharmacy more and more. Maybe before that, two, three days a week at least I wouldn't bother … But that made me go there more regularly, that went in my system more regularly, so I smoked much much less after three months. Much less. Extremely much less*'. (P08;T2)

3.6 | Therapeutic alliance

3.6.1 | Supportive

The mCM was perceived to offer a level of therapeutic support. Patients described the connection they developed to the system as supportive, encouraging and personal. At T2, some patients reported the praise messages had become repetitive and predictable due to the automaticity and lack of a two-way interaction. However, they

still perceived the system as compassionate and considerate, understanding and aware of their treatment goals.

> '*For the time being I want maintenance, and I think that's what the text message wanted as well, because it gives me a bonus, like if I go every day. So, they want me to go every day, that's why they give me more money*'. (P04;T2)

3.6.2 | Non-judgemental

A prominent theme was the importance of a relationship or connection that lacked judgement. Patients described how they have previously felt judged and stereotyped by pharmacy staff. It was clear how these hostile and unfriendly interactions they experienced could discourage engagement and attendance at the pharmacy.

> *'I've been to some pharmacies, and you can tell they just don't want you in there. They don't take their eyes off you … And it's quite hostile. And it's like obviously you're on methadone, so you take heroin, but then they just think oh, this person has come for their methadone, they're going to steal from my shop or whatever. That's another reason I dropped off script before'*. (P06;T2)

The mCM was perceived by patients as considerate to the difficulties they faced in adhering to daily supervised methadone consumption, describing it as non-inquisitive nor punishing when they missed a day.

> '*Yeah, cos to me it helps. To me, regardless of what I get at the end of it. It doesn't talk back to you! It's acknowledging you and saying thank you*'. (P03;T1)

3.6.3 | Trust

Despite the desire to achieve continued adherence to their methadone, many described the difficulties in doing so. In most cases, participants felt confident that the mCM would provide them with the encouragement to achieve this, and over time, they experienced a reliance on the telephone system. They trusted that their treatment goals were shared by the system, and that the praise messages and incentives would encourage them to attend their pharmacy daily. This was highlighted by one patient at T2, who expressed concern about the intervention ending, indicating that they did not know if they could maintain adherence without the mCM:

> '*Probably I am reliant on them* [text messages] *now, so let's see how it's going to affect me*'. (P04;T2)

3.6.4 | Two-way process

Patients described a therapeutic relationship as a two-way process, defined by an understanding, respect, openness, honesty, encouragement, support, trust and patience. However, the development and importance of this connection was dependent on the nature of the relationship and the level of interaction involved. Although interactions with the mCM intervention were positive, not all patients found themselves developing a relationship with it. Some deemed two-way interaction to be key in the development of a therapeutic relationship, and the lack of such, impeded development of a relationship in this context. The lack of interaction and automaticity of the messages made them become repetitive and predictable for some.

> '*How can you build a relationship with a computerised text message. It isn't like it's asking you any questions, it's just sending you a message*'. (P09;T2)

4 | DISCUSSION

This research set out to capture patients' experience of mCM to encourage their adherence to supervised methadone treatment. Existing literature shows that although patients acknowledge the benefits of methadone treatment and recognise the importance of supervised consumption, they experience a range of factors that negatively impact upon their adherence to supervised methadone, including situational difficulties, continued drug use and the associated stigma with OAT [34–36]. These issues, interplaying or operating solely, are responsible for patients missing doses or dropping out of OAT. Given the limited but encouraging evidence that mCM can promote positive outcomes in other contexts [16], this work provides support for the view that mCM is both acceptable and has potential application in the context of supervised OAT.

The results are consistent with prior studies that support the use of technology to monitor behaviour and deliver incentives remotely [18–24]. Mobile telephone-ownership has been reported to be as high as 96% among

UK patients in treatment for substance use disorder, making mCM a feasible approach to address treatment-related behaviour change [18]. Patients reported positive attitudes and acceptability towards incentive-based interventions and the use of mobile telephones to receive these remotely. Despite the remote application, the mechanisms of CM operated as intended: patients understood what was expected of them; what they needed to do to obtain the positive reinforcement; how and why they were required to record their methadone consumption; and how and when they could access their incentives. The incentive was a strong motivator and a desirable consequence that was meaningful to the patients. It encouraged compliance with their methadone at times when they were faced with issues negatively impacting upon their adherence. Although the need for an intervention to enhance compliance was not always voiced by patients, with some placing significant emphasis on their self-determination and motivation to engage with their treatment, their narratives illustrated a conflicting scenario whereby the incentives played a significant role in enhancing their adherence to their methadone.

This study builds on previous findings by highlighting the key mechanisms that appear to operate and influence patient's experience and outcomes. The impact the praise messages and incentives had in boosting patient's confidence and belief in themselves and their treatment was profound: helping them feel proud about accomplishing their daily goal; and providing validation that they could achieve their treatment goals. This was particularly important at times when patients felt like a burden to those around them. These findings are similar to those reported in the existing small literature based on mCM targeting buprenorphine adherence, which describes how patients found the intervention to be helpful in strengthening their adherence to their OAT [37].

A prominent finding was the development of a connection with the mCM intervention, one that in many aspects resembled a therapeutic alliance. These interactions were deemed positive, friendly and non-critical. Patients described how the system was non-judgemental nor punishing when they missed a day and was understanding of the difficulties they faced which impacted upon their adherence to their methadone. This was raised in reflection upon previous negative experiences patients had, whereby they felt discriminated against due to being in OAT. These findings echo existing evidence around the omnipresence of stigma in addiction treatment and the role it plays in creating a barrier to patient's accessing and staying in OAT [38]. An advantage of CM is that it focuses on what the client does well, and not on what they fail to achieve [18, 39], and therefore future research must recognise the importance of these non-judgmental interactions in the development of mCM interventions. However, these messages did become repetitive and predictable for some, highlighting a need for future research to utilise a larger bank of praise messages to be sent in rotation.

Another important component of this connection was the confidence and reliance patients placed in the mCM intervention to help in their treatment. Patients felt confident that the mCM would provide them with motivation to achieve enhanced adherence to their methadone and, over time, found themselves relying on the telephone system. This connection was also one of trust: patients trusted that their treatment goals were shared by the mCM intervention, and the reward would act as an incentive to attend their pharmacy daily. Despite the obvious differences between treatment modalities such as face to-face and automated technology-based interactions, the connection developed and described by participants was not too dissimilar to that typically reported in traditional face-to-face communications [40].

However, it was apparent that this connection and the importance of it differed across participants. These findings partially dispute the existing literature which suggests that patients can develop a connection in the absence of any therapist involvement in the delivery of the intervention [41]. However, previous literature has examined this in the context of a mobile cognitive behaviour therapy intervention which naturally differs from CM interventions in terms of the therapeutic support provided. Therefore, the nature of the intervention itself, regardless of mode of delivery, most likely plays a role in the development of this relationship. Furthermore, although the importance of this therapeutic alliance for generating treatment outcomes is well documented [28], the importance of this in the context of remote CM remains unknown. While it was apparent that a connection with the mCM could be established, it was not deemed imperative for patients' engagement with their methadone treatment. Although these findings are in conflict with findings from traditional face-to-face interventions, they support recent findings which question the importance of this relationship in the context of remote technology-based interventions [42]. Studies examining the role of the therapeutic relationship in mHealth (use of mobile and wireless technologies to improve health outcomes) suggest this is a less robust predictor of outcomes in this context [29, 43]. Future research needs to examine the psychometric properties of the therapeutic alliance and how it influences outcomes in mHealth interventions.

This study provides an integral and personal understanding of patients' experience of mCM and the results offer valuable knowledge and insight that will benefit the

development and implementation of future mCM interventions. Intervention fidelity and adherence to the mCM was high, with 96% (517 out of 538 days) agreement between pharmacy records and patient logins (i.e., the number of days when logins to the tablet at the pharmacy matched the number of days reported in pharmacy records of participants attending and receiving supervised methadone). However, this project is not without its limitations and findings cannot be generalised empirically. The sample size was small due to the poor recruitment to the TIES study, and the novelty of this research meant there was no opportunity to expand the research outside this context. Despite this, 15 interviews were conducted, enabling an in-depth and thorough exploration of how the mechanisms of CM operate in the absence of human interaction and how other factors such as acceptability, feasibility and therapeutic alliance influence experience and outcomes.

5 | CONCLUSION

Given the complexity of methadone treatment and the difficulties patients experience in achieving daily adherence to supervised consumption, it is imperative to explore ways in which individuals can be supported through their treatment. The mechanisms underpinning CM appear to operate in the absence of human interaction, and the remote delivery of positive reinforcement is sufficient to, and serves the purpose of, encouraging adherence to supervised methadone. The mCM intervention was deemed to be meaningful and patients placed particular importance on its impact on their adherence to their methadone, drug use and overall mental health, due to positive interactions of encouragement, and the establishment of a therapeutic alliance, representing trust, reliance, confidence and support. Overall, the findings presented in this paper suggest mCM was acceptable, well received by patients, and contributed to the development of enhanced and sustained adherence to their supervised methadone. Therefore, these findings provide support for the application of mCM in this context and warrant the evaluation of mCM to promote methadone adherence in a randomised controlled trial.

AUTHOR CONTRIBUTIONS

Each author certifies that their contribution to this work meets the standards of the International Committee of Medical Journal Editors.

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CONFLICT OF INTEREST

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REFERENCES

1. Prendergast M, Podus D, Finney J, Greenwell L, Roll J. Contingency management for treatment of substance use disorders: a meta-analysis. Addiction. 2006;101:1546–60.
2. Lussier JP, Heil SH, Mongeon JA, Badger GJ, Higgins ST. A meta-analysis of voucher-based reinforcement therapy for substance use disorders. Addiction. 2006;101:192–203.
3. Griffith JD, Rowan-Szal GA, Roark RR, Simpson DD. Contingency management in outpatient methadone treatment: a meta-analysis. Drug Alcohol Depend. 2000;58:55–66.
4. Gates PJ, Sabioni P, Copeland J, Le Foll B, Gowing L. Psychosocial interventions for cannabis use disorder. Cochrane Database Syst Rev. 2016;5:CD005336.
5. Benishek LA, Dugosh KL, Kirby KC, Matejkowski J, Clements NT, Seymour BL, et al. Prize-based contingency management for the treatment of substance abusers: a meta-analysis. Addiction. 2014;109:1426–36.
6. Preston KL, Silverman K, Umbricht A, DeJesus A, Montoya ID, Schuster CR. Improvement in naltrexone treatment compliance with contingency management. Drug Alcohol Depend. 1999;54:127–35.
7. DeFulio A, Everly JJ, Leoutsakos JMS, Umbricht A, Fingerhood M, Bigelow GE, et al. Employment-based reinforcement of adherence to an FDA approved extended release formulation of naltrexone in opioid-dependent adults: a randomized controlled trial. Drug Alcohol Depend. 2012;120:48–54.
8. Silverman K, Holtyn AF, Rodewald AM, Siliciano RF, Jarvis BP, Subramaniam S, et al. Incentives for viral suppression in people living with HIV: a randomized clinical trial. AIDS Behav. 2019;23:2337–46.
9. Weaver T, Metrebian N, Hellier J, Pilling S, Charles V, Little N, et al. Use of contingency management incentives to improve completion of hepatitis B vaccination in people undergoing treatment for heroin dependence: a cluster randomised trial. Lancet. 2014;384:153–63.
10. Kidorf M, Brooner RK, Gandotra N, Antoine D, King VL, Peirce J, et al. Reinforcing integrated psychiatric service

attendance in an opioid-agonist program: a randomized and controlled trial. Drug Alcohol Depend. 2013;133:30–6.
11. Schacht RL, Brooner RK, King VL, Kidorf MS, Peirce JM. Incentivizing attendance to prolonged exposure for PTSD with opioid use disorder patients: a randomized controlled trial. J Consult Clin Psychol. 2017;85:689–701.
12. Chen W, Hong Y, Zou X, McLaughlin MM, Xia Y, Ling L. Effectiveness of prize-based contingency management in a methadone maintenance program in China. Drug Alcohol Depend. 2013;133:270–4.
13. Metrebian N, Weaver T, Goldsmith K, Pilling S, Hellier J, Pickles A, et al. Using a pragmatically adapted, low-cost contingency management intervention to promote heroin abstinence in individuals undergoing treatment for heroin use disorder in UK drug services (PRAISE): a cluster randomised trial. BMJ Open. 2021;11:e046371.
14. Dallery J, Raiff BR. Contingency management in the 21st century: technological innovations to promote smoking cessation. Subst Use Misuse. 2011;46:10–22.
15. DeFulio A. Dissemination of contingency management for the treatment of opioid use disorder. Perspect Behav Sci. 2022; 1-15. https://doi.org/10.1007/s40614-022-00328-z
16. Getty CA, Morande A, Lynskey M, Weaver T, Metrebian N. Mobile telephone-delivered contingency management interventions promoting behaviour change in individuals with substance use disorders: a meta-analysis. Addiction. 2019;114:1915–25.
17. DeFulio A, Rzeszutek MJ, Furgeson J, Ryan S, Rezania S. A smartphone-smartcard platform for contingency management in an inner-city substance use disorder outpatient program. J Subst Abus Treat. 2020;120:108188.
18. Getty CA, Weaver T, Lynskey M, Kirby KC, Dallery J, Metrebian N. Patients' beliefs towards contingency management: target behaviours, incentives and the remote application of these interventions. Drug Alcohol Rev. 2022;41:96–105.
19. DeFulio A, Devoto A, Traxler H, Cosottile D, Fingerhood M, Nuzzo P, et al. Smartphone-based incentives for promoting adherence to antiretroviral therapy: a randomized controlled trial. Prev Med Rep. 2021;21:101318.
20. Hertzberg JS, Carpenter VL, Kirby AC, Calhoun PS, Moore SD, Dennis MF, et al. Mobile contingency management as an adjunctive smoking cessation treatment for smokers with posttraumatic stress disorder. Nicotine Tob Res. 2013;15:1934–8.
21. Kong G, Goldberg AL, Dallery J, Krishnan-Sarin S. An open-label pilot study of an intervention using mobile phones to deliver contingency management of tobacco abstinence to high school students. Exp Clin Psychopharmacol. 2017;25: 333–7.
22. Beckham JC, Adkisson KA, Hertzberg J, Kimbrel NA, Budney AJ, Stephens RS, et al. Mobile contingency management as an adjunctive treatment for co-morbid cannabis use disorder and cigarette smoking. Addict Behav. 2018;79: 86–92.
23. Metrebian N, Carr E, Goldsmith K, Weaver T, Pilling S, Shearer J, et al. Mobile telephone delivered contingency management for encouraging adherence to supervised methadone consumption: feasibility study for an RCT of clinical and cost-effectiveness (TIES). Pilot Feasibility Stud. 2021;7:14.
24. Hammond AS, Sweeney MM, Chikosi TU, Stitzer ML. Digital delivery of a contingency management intervention for substance use disorder: a feasibility study with DynamiCare Health. J Subst Abus Treat. 2021;126:108425.
25. Neale J, Tompkins CN, Strang J. Qualitative evaluation of a novel contingency management-related intervention for patients receiving supervised injectable opioid treatment. Addiction. 2016;111:665–74.
26. Henson P, Peck P, Torous J. Considering the therapeutic alliance in digital mental health interventions. Harv Rev Psychiatry. 2019;27:268–73.
27. Day E, Mitcheson L. Psychosocial interventions in opiate substitution treatment services: does the evidence provide a case for optimism or nihilism? Addiction. 2017;112:1329–36.
28. Horvath AO, Symonds BD. Relation between working alliance and outcome in psychotherapy: a meta-analysis. J Couns Psychol. 1991;38:139–49.
29. Cavanagh K, Millings A. (Inter) personal computing: the role of the therapeutic relationship in e-mental health. J Contemp Psychother. 2013;43:197–206.
30. Kiluk BD, Serafini K, Frankforter T, Nich C, Carroll KM. Only connect: the working alliance in computer-based cognitive behavioral therapy. Behav Res Ther. 2014;63:139–46.
31. Strang J, Group IEW. Drug misuse and dependence: UK guidelines on clinical management. London: Department of Health and Social Care, UK gov; 2017.
32. Ritchie J, Spencer L. Qualitative data analysis for applied policy research. Analyzing qualitative data. London: Routledge; 2002. p. 187–208.
33. Neale J. Iterative categorization (IC): a systematic technique for analysing qualitative data. Addiction. 2016;111:1096–106.
34. Stone E, Fletcher K. User views on supervised methadone consumption. Addict Biol. 2003;8:45–8.
35. Anstice S, Strike CJ, Brands B. Supervised methadone consumption: client issues and stigma. Subst Use Misuse. 2009;44: 794–808.
36. Woo J, Bhalerao A, Bawor M, Bhatt M, Dennis B, Mouravska N, et al. "Don't judge a book by its cover": a qualitative study of methadone patients' experiences of stigma. Subst Abus. 2017;11:1178221816685087.
37. DeFulio A, Brown HD, Davidson RM, Regnier SD, Kang N, Ehart M. Feasibility, acceptability, and preliminary efficacy of a smartphone-based contingency management intervention for buprenorphine adherence. Behav Anal Pract. 2022; 15:1–9.
38. Mayock P, Butler S. "I'm always hiding and ducking and diving": the stigma of growing older on methadone. Drugs Educ Prev Policy. 2022;29:139–49.
39. Rash CJ, Petry NM, Kirby KC, Martino S, Roll J, Stitzer ML. Identifying provider beliefs related to contingency management adoption using the contingency management beliefs questionnaire. Drug Alcohol Depend. 2012;121:205–12.
40. Horvath AO, Del Re AC, Flückiger C, Symonds D. Alliance in individual psychotherapy. Psychotherapy (Chic). 2011;48(1): 9–16.
41. Clarke J, Proudfoot J, Whitton A, Birch MR, Boyd M, Parker G, et al. Therapeutic alliance with a fully automated mobile phone and web-based intervention: secondary analysis of a randomized controlled trial. JMIR Ment Health. 2016;3:e10.
42. Ormrod JA, Kennedy L, Scott J, Cavanagh K. Computerised cognitive behavioural therapy in an adult mental health service: a pilot study of outcomes and alliance. Cogn Behav Ther. 2010;39:188–92.
43. Berry K, Salter A, Morris R, James S, Bucci S. Assessing therapeutic alliance in the context of mHealth interventions for

mental health problems: development of the mobile Agnew relationship measure (mARM) questionnaire. J Med Internet Res. 2018;20:e8252.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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