



# Implementation of a contingency approach for people with co-occurring substance use and psychiatric disorders: Acceptability and feasibility pilot study



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## ABSTRACT

**Introduction:** The prevalence of co-occurring substance use and psychiatric disorders is high. Contingency-based interventions have been shown to be effective in promoting adherence to treatment for people with substance use disorders but are among the least used evidence-based interventions for clients with comorbid psychiatric disorders, related to acceptability issues.

**Objective:** The present implementation study aims to evaluate the acceptability and feasibility of a contingency approach in co-occurring disorders specialized treatment services.

**Methodology:** Focus groups were conducted with health professionals and service users recruited from a specialized co-occurring disorder program (COD). Pre-intervention focus groups were conducted to select preferred modalities to implement the program. Post-intervention focus groups were conducted to document the satisfaction and benefits of the intervention. Throughout the study, program monitoring was conducted systematically to determine the gaps between planned and actual interventions.

**Results:** Both health professionals consulted and service users agreed that the contingency approach could be integrated within usual co-occurring disorders treatment. In general, patients more readily accepted the contingency approach than health professionals. The higher functioning level group reported several benefits from the approach and implementation in its group sessions went as planned. Contingency approach was described by all participants as consistent with general treatment goals and led to patient's awareness about their group attendance.

**Conclusion:** This study highlights several challenges related to the implementation of a contingency approach. It also suggests that implementation of this approach could benefit from taking into account the needs and perspectives of service users.

## 1. Introduction

The prevalence of substance use and psychiatric disorders co-occurrence is high (Forman-Hoffman, Batts, Hedden, Spagnola, & Bose, 2018). Indeed, 30 to 50% of patients with psychiatric diagnosis also present a substance use disorder (Drake et al., 2001; Fridell & Nilson, 2004). Inversely, as much as 80% of patients with substance use disorders suffer from a mental health disorder in certain vulnerable subgroups (Fridell & Nilson, 2004). Co-occurring substance use and mental health disorders (COD) are complex to treat as they are associated with psychosocial issues and high overall severity (Rush & Koegl, 2008). Persons with COD present a higher rate of justice problems, employment related issues, psychosocial instability and low compliance to

treatment (Mueser, Noordsy, Drake, & Fox, 2003; Rush & Koegl, 2008). Best practice recommendations for COD concur that these complex issues need to be addressed with integrated, multimodal treatment strategies (Drake et al., 2016; McKee, 2017). Integrated COD programs have a primary role to apply recommended best practices and a secondary role to generate and disseminate new knowledge (Dubreucq, Chanut, & Jutras Aswad, 2012).

There is sufficient evidence that the contingency management (CM) is one of the most efficient and cost-effective psychosocial treatments to promote better outcomes and treatment adherence for patients with substance abuse disorders and COD (Dutra et al., 2008; Garner et al., 2012; McPherson et al., 2018; Vandrey, Stitzer, Acquavita, & Quinn-Stabile, 2011). However, in clinical settings for substance use disorders

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and even in integrated care services, CM is not systematically implemented (Petry, Alessi, Olmstead, Rash, & Zajac, 2017). Indeed, with CM, there can be issues of implementation due to the negative opinion of health professionals and clients on this modality to promote abstinence which results in low acceptability (Alettaris, Shelton, & Roman, 2015; Srebnik et al., 2013). In addition, this approach needs planning and financing, therefore feasibility can be compromised (Petry, Alessi, Olmstead, Rash, & Zajac, 2017). This study aims to assess the acceptability, the feasibility and the implementation of the CM in therapeutic groups in a COD integrated program of a university hospital center, guided by a harm reduction philosophy, that applies more than 90% of best practice recommendations and in which the CM is not implemented.

### 1.1. Contingency management

Contingency management (CM) is based on behavioral theories as it uses reinforcement to change behaviors. In addiction treatment programs, CM is used to reinforce patients' behaviors with rewards. There are several types of rewards that are commonly used in those settings: access to clinical privileges (such as methadone take-home privileges), on-site prize distribution, token system and their derivatives, money, and community reinforcers like vouchers for activities (Kellogg, Petry, & Kreek, 2007). Contingency management efficacy is well supported by substance use treatment literature, targeting abstinence from all substances including alcohol, stimulants, opiates, marijuana, nicotine and polydrug use (Benishkek et al., 2014; Petry et al., 2017). Compared to other psychosocial interventions, CM has been demonstrated to be one of the most effective behavioral interventions for initiating and maintaining abstinence from alcohol and drugs (Dutra et al., 2008). Moreover, CM has been found to be an effective strategy for reducing alcohol and drug use in clinical trials conducted among individuals with co-occurring substance use disorders and severe mental illnesses (McDonnell et al., 2013; 2017; McPherson et al., 2018). The use of CM for abstinence with co-occurring substance use and other common mental health issues like mood disorders has been less studied.

Less commonly than abstinence, adherence to treatment is targeted by this approach, implying that the patient follows the recommendations proposed by the clinical care providing team. These recommendations may be to adequately follow a medication regimen, to follow a diet, to attend appointments or to make lifestyle changes (World Health Organization, 2003). Contingency management has been found to increase treatment attendance for people with substance use disorders, as shown in several studies looking at group interventions (Helmus, Saules, Schoener, & Roll, 2003; Ledgerwood, Alessi, Hanson, Godley, & Petry, 2008; Petry, Weinstock, & Alessi, 2011; Walker et al., 2010). A recent randomized controlled trial looked at CM efficacy on attendance in a COD population ( $n = 160$ ) and found that participants enrolled in the CM condition were approximately twice as likely to remain in treatment longer than those in the control condition (Kelly, Daley, & Douaihy, 2014). This study is one of the few that includes all mental health disorders: depressive, bipolar, anxiety, psychotic and other disorders.

In addition to improving drug abstinence and adherence to treatment, the use of a CM lead to a better quality of life, as well as lower rates of psychiatric symptoms and inpatient-treatment episodes, as shown in clinical trials with outpatients with SUDs and severe mental illness (Bellack, Bennett, Gearon, Brown, & Yang, 2006; McDonnell et al., 2013; 2014). A recent review underlined that there is no data supporting evidence of adverse outcomes of CM (Petry et al., 2017).

### 1.2. Implementation of CM

Implementation refers to the fidelity to elements of a theoretical program's protocol or intervention, including consistency of delivery as intended (Bowen et al., 2009). Implementation is commonly linked to

acceptability and feasibility components. Acceptability looks at how targeted clinicians and patients react to the intervention (Bowen et al., 2009). Among other concepts, feasibility often refers to practicality, which is the availability of resources, time and commitment necessary for implementation of the intervention (Bowen et al., 2009).

Despite all the evidence supporting its efficacy for abstinence and adherence to treatment with substance use disorders and co-occurring disorders, CM is the least implemented of all evidence-based psychosocial interventions in clinical settings (Petry et al., 2017). Several studies have focused on the implementation and maintenance of CM with SUDs (Petry & Simcic, 2002; McPherson et al., 2018), exposing the common obstacles to implementation in clinical settings, such as incoherence with clinician's values and funding needed to set it up. In the recent years, authors in the field raised questions about ways to adapt CM for vulnerable populations such as COD (Carroll, 2014; McDonnell et al., 2013; 2017; McPherson et al., 2018; Srebnik et al., 2013) in order to disseminate its use and benefits. To our knowledge, few studies of CM implementation have been performed in COD programs (McPherson et al., 2018; Srebnik et al., 2013) and no studies have been specifically conducted on COD populations with common mental disorders (Carroll, 2014).

## 2. Objectives

This study aims to assess the acceptability and feasibility of the contingency management among service providers and patients having comorbid substance use and psychiatric disorders in a clinical setting offering integrated treatment for co-occurring disorders. Specifically, this study aims to:

1. Assess the conformity of the clinical implementation to the planned theoretical intervention.
2. Describe the acceptability and the feasibility of the implementation of the contingency management from the health professionals' and patients' standpoint.

## 3. Material and methods

The steps of the methodology are based on the theoretical framework developed by Love (2004) and are describing the main components of an implementation study: 1. Needs and feasibility assessment; 2. Planning and design of the intervention; 3. Operationalization; and 4. Improvement of the intervention. The methodology used to achieve each of these components is described in the following sections.

### 3.1. Needs and feasibility assessment

Preliminary meetings were held with the health care team of a COD clinic to verify their perception of the contingency management, identify possible obstacles for the intervention and to target a population that could benefit from the approach. A discussion group with all the clinicians of the COD program was held by the first two authors of the article and followed an interview guide developed for this purpose.

### 3.2. Planning and design of the intervention

The methodology used to plan and conceive the intervention is based on the Contingency Management: "Foundations and Principles, a guide for the implementation of the contingency approach in the treatment of addictive disorders", written by Kellogg et al. (2007). Kellogg et al. (2007) established the founding components that need to be clarified in the conception of the intervention. The following steps were then completed in discussion groups with the health professionals of the COD program: 1) Target the population to whom the approach will be implemented; 2) Target the behavior to modify; 3) Select the reinforcement; 4) Assess the level of interest granted by the patient; 5)

Determine the timing of the reinforcement; 6) Determine the duration of the intervention. Additional discussion groups with the selected patients were then held following an interview guide to do the selection of the nature and timing of the reinforcement, as well as assess of the level of their interest for the contingency management.

### 3.3. Operationalization

Existing therapy groups that corresponded to the targeted population were identified for the implementation of the conceived intervention. Patients from these groups were included in the study and first recruited for the planning discussion groups. Both the nature and the timing of the reinforcers were discussed with health professionals and identified patients; the discussions have taken as a basis some existing applications of CM with voucher-type reinforcers (Kellogg et al., 2007) and drawing sessions in substance use treatment (Peirce et al., 2006).

#### 3.3.1. Therapy groups

The two selected groups are in place in the outpatient clinic and are given three to four times per year for 12 sessions each. Group A is designed for low functioning level patients and addresses themes such as housing, substance related harms and hygiene using a motivational approach. Group B is designed for higher functioning level patients and addresses themes such as healthy relationships and control over substance use using the seeking-safety approach (Najavits & Hien, 2013). The referral to both groups is decided by clinicians with the functional criteria based on their clinical judgement, regardless of the diagnosis of each patient.

#### 3.3.2. Pilot study

The contingency management has been implemented in group A and B of the COD program to promote the weekly presence of participants. Over the period of 12 weeks, participants received tokens for attending the group sessions. The group leader, a healthcare professional, was responsible to distribute the tokens and record in a grid the number of tokens allocated to each participant. The co-researcher was responsible for buying the vouchers and leading the drawing sessions to facilitate the initial implementation of the approach.

### 3.4. Improvement of the intervention

Following the contingency management intervention, focus groups were conducted: one with the health professionals, one with participants from each group separately. An interview guide (see Table 1) was developed and used to explore patients' and health professionals' appreciation on adding the new modality in their therapeutic group. All focus groups lasted 60 min and were recorded using a Samsung electronic device. The meetings were led by research co-investigators. Additional individual interviews were held with the leaders of the two groups.

#### 3.4.1. Collected data

Detailed information was collected at each stage of the implementation of the program.

Information on implementation components such as the health

**Table 1**

Interview guide for patients and health professionals.

1. How would you describe your experience with the contingency management?
2. How has the introduction of contingency management favoured / harmed the running of the sessions (reinforcers, organization, clarity of instructions)?
3. Is it an intervention that you would maintain in the future?
4. Was what was planned different than what was finally implemented (resources added, removed, modified)? (Only health professionals)
5. Has your perception of the contingency management changed?
6. What changes would you make to the approach, what would you keep unchanged?

professionals involved, final cost and nature of the reinforcers and attendance at group sessions was collected. Patient characteristics were collected through a socio-demographic questionnaire.

In order to study the links between the qualitative collected data, a descriptive interpretive design as described by Gallagher (2014) was used. At first, all discussion group recordings were transcribed in a verbatim. Afterwards, general information on participants was annexed in each transcription.

### 3.5. Data analysis

The collected sociodemographic data was compiled in a table with the same categories as the questions that the patients were asked. Material resources, human resources, participants' characteristics and group leaders' characteristics were analyzed using descriptive statistics such as averages and percentages. The collected quantitative data for the rate of implementation was compiled in a table with categories related to the human and material resources needed and compares planned resources and actual resources used.

The collected qualitative data was taken from the verbatim and the co-researcher's logbook and classified in main theme categories when similar ideas emerged. These categories were exhaustive, mutually exclusive, conceptually congruent and linked to the research questions. All data that could be classified in the different categories was compiled to support the main themes.

### 3.6. Recruitment and ethics approval

Following the approval of the project by the ethics committee of the Research Center of the Montreal University Hospital Center (CRCHUM), the co-researcher contacted the participants during their group therapy session to proceed with the recruiting procedure: explanation about the project, planning of the focus group sessions and careful review of the consent form. The participants were recruited by health professionals leading existing therapeutic groups of the COD program and referred to study staff for explanation and consent. All patients being part of a therapeutic group that were given at the clinic were eligible for the study. The enrolment was still open after the initiation of the study. Each patient received a financial compensation in the amount of CAD 20\$ to participate in each discussion or focus group.

## 4. Results

All the health professionals working in the COD program ( $n = 10$ , named HP01 to HP10) accepted to participate in the study (four social workers, two nurses, two psychiatrists, one drug addiction worker and one occupational therapist). They had a median of 8 years of experience (ranging from 3 to 25 years) with patients presenting comorbidities such as substance abuse and psychiatric disorders. The health professionals involved in the study identified their regular outpatient therapeutic groups scheduled to start in the following months, in which patients correspond to the target population and within which there are attendance challenges; there was one session of group A and two sessions of group B. The chosen groups were co-animated by a social worker and a nurse for group A and animated by an occupational therapist or a social worker for groups B. These four professionals were more closely involved in the implementation of the contingency management.

All 18 patients selected in the COD program accepted to be part of the study. Two (2) participants did not complete the study, one (1) stopped coming to the clinic for unknown reasons and was unable to be contacted and one (1) started school full-time; their data was not considered in the results. Table 2 presents characteristics of patients involved in the study (see Table 2). Patients in group A ( $n = 5$ , named P01 to P05), designed for persons with lower functioning level, presented homogeneous characteristics by their sex (100% were male),

**Table 2**  
Characteristics of patients involved in the study (Group A  $n = 5$ ; Group B  $n = 11$ ).

Variable	Group A	Group B
Continuous variable	<b>Mean (SD)</b>	<b>Mean (SD)</b>
Age (years)	29.6 (6.4)	45.2 (11.9)
Categorical variables	<b>n (%)</b>	<b>n (%)</b>
Sex (male)	5 (100)	4 (36)
<b>Psychiatric diagnosis</b>		
Psychotic disorder/schizophrenia	5 (100)	0
Personality disorder	0	4 (36)
Anxiety disorder	0	1 (9)
Depression	0	2 (18)
ADHD	0	4 (36)
<b>Main substance abuse diagnosis</b>		
Cannabis	2 (40)	0
Cocaine	1 (20)	3 (27)
Amphetamines	2 (20)	2 (18)
Alcohol	0 (0)	4 (36)
Ketamine	0 (0)	1 (9)
Opiates	0 (0)	1 (9)
<b>Marital status</b>		
Married or common law spouse	0	3 (27)
Single	5 (100)	4 (36)
Divorced or separated	0	4 (36)
<b>Education (Highest diploma/degree obtained)</b>		
Elementary school	2 (40)	0
High school diploma	2 (40)	2 (18)
Vocational or college diploma	0	1 (9)
University degree	1 (20)	8 (73)
<b>Income source</b>		
Job	1 (20)	3 (27)
Unemployment compensation	0 (0)	1 (9)
Welfare	5 (100)	5 (45)
Other	0 (0)	2 (18)
<b>Housing</b>		
Homelessness	0 (0)	1 (9)
Supervised housing	2 (40)	0
Autonomous housing	2 (40)	10 (81)
Hospital	0	0
Temporary housing (friend, family member)	1 (20)	0

their psychiatric diagnostic (100% had psychotic disorders), their marital status (100% were single), and their education level (80% reach a high school level or less). Patients in group B ( $n = 11$ , named P06 to P16), designed for people with a higher functioning level, were more heterogeneous. Men and women were both represented (36% and 64% respectively), all patients had common mental disorders such as depression and anxiety as psychiatric diagnosis (no one had a psychotic disorder), and present a higher education level (a majority had an university diploma).

The preliminary consultations conducted with health professionals of the COD program ( $n = 10$ ) concluded that the contingency management is a sufficiently acceptable therapeutic tool to be implemented. The behavior to modify was group attendance. The health professionals expressed a preference for voucher-type reinforcers of low monetary value (maximum value CAD \$20). They also concurred that each group attendance should be given a token that gives a chance at a drawing for the rewards. The health professionals agreed that the implementation of the approach should be done for the usual duration of the therapeutic groups, namely 12 weeks. Another point that emerged from the discussion group held with health professionals was that the implementation should be based on a collaborative approach and patients must be involved to share their perspective on the approach and their potential benefits.

In the initial discussion group, patients were asked about their interest in the contingency management. They expressed being sceptical about the necessity of the approach, since they were already motivated

**Table 3**  
Presence and drawing rules.

Presence rules
<ul style="list-style-type: none"> <li>■ For each presence the participant receives tokens from the speaker.</li> <li>■ The number of tokens received increases each time the participant comes to the sessions consecutively (1 token received for the first presence, 2 for the 2nd, 3 for the 3rd, and so on until the 6th meeting).</li> <li>■ In case of absence, the participant doesn't receive a token, without losing those accumulated in previous sessions.</li> <li>■ The participant receives tokens that he could have accumulated at the missed session at the next one that he attends.</li> <li>■ At the 7th meeting the token countdown restarts (1 token received for the 7th session, 2 for the 8th, 3 for the 9th, and so on until the 12th meeting).</li> <li>■ It's not possible to exchange tokens with other participants of the group (the speaker monitors the tokens distributed to the patient in the attendance form).</li> </ul>
Drawing rules
<ul style="list-style-type: none"> <li>■ At the 6th and 12th group session participants can exchange their tokens against drawing rights in a container with gift cards.</li> <li>■ Drawings are done in the regularly scheduled therapy sessions, in the presence of the other participants.</li> <li>■ It takes 4 tokens to have the right to dip once in the container.</li> <li>■ All tokens must be used at the 6th and 12th session.</li> <li>■ If a participant has less than 4 tokens remaining at the end of the drawing session, they will be added to those obtained at the next meeting.</li> </ul>

to participate in the groups. Nevertheless, they manifested their willingness to try this new modality. Patients then selected the rewards and the timing for their distribution. They decided that the rewards should be vouchers for participating in community based activities (going to the movies, to theater plays, to comedy shows and to dance shows) and gift cards valid at stores, supermarkets and restaurants. The patients also decided the timing of the drawing for the rewards, at the 6th and 12th session. Finally, the health professionals decided all the presence and drawing rules to be applied in both therapeutic groups for they fit in their particular context (see Table 3).

#### 4.1. Implementation

Four health professionals have animated the therapeutic groups. A total of 12 sessions were held, as scheduled (see Table 4). All the drawing sessions were provided as planned in group B. Otherwise, there were one drawing session out of two that were provided in group A because participants didn't show up at their last drawing session. The total cost of implementing the contingency management at the COD program was CAD\$ 675.00 (lower than an estimated maximal cost of CAD\$ 900.00). When consulted in the initial focus group, participants from both groups asked for voucher exchangeable for activities instead of money or high value prizes (eg. they refused our proposal of one larger prize of CAD\$ 150.00). In both groups, the main prizes that emerged during the drawings were: gift cards to go to the movies, to do groceries and to attend cultural events. The cost of the chosen reinforcers, the lesser number of drawing sessions and the unclaimed prizes resulted in a lower than expected overall cost.

#### 4.2. Acceptability

##### 4.2.1. Health professionals' perspective on the acceptability of the contingency management

During the first consultations with the health professionals of the COD program, they demonstrated openness to the possibility of implementing this approach with their clients but also expressed doubts about the real benefits of this approach. The health professionals were questioning the concept behind the approach of compensating a patient to seek a treatment.

*I was sceptical at first, because I wondered if it was necessary. If there*

**Table 4**  
Contingency management components implementation rate.

Implementation components that have been planned	Implementation components that have been put into practice	Percentage of accomplishment
4 health professionals animating the therapeutic groups	4 health professionals animating the therapeutic groups	100%
12 therapy sessions for each group	12 therapy sessions for each groupe	100%
2 drawing sessions in group A	1 drawing session in group A	50%
2 drawing sessions in group B	2 drawing sessions in group B	100%
Maximum expected cost for the reinforcers: CAD\$ 900.00	Cost for the reinforcers: CAD\$ 675.00	–

were no other acceptable privileges that could've been implemented instead. (HP04)

After experimenting the contingency management, health professionals witnessed an increased motivation from participants in receiving tokens. The health professionals therefore expressed their readiness to pursue the process and get more involved in it over a longer period of time.

*I think it would be worthwhile to pursue the project and see its benefits on more than 12 weeks. (HP03)*

*We tested this approach in group A and B, but I think it would be interesting to test it with different therapeutic modalities because twelve weeks wasn't enough. (HP06)*

*I feel like I didn't internalize the approach well enough to be able to implement it within my group, because it was the co-investigator who handled the drawing sessions and the meetings with the participants to determine their gift choices. I felt detached from this program. I think if I had been responsible of the drawing sessions I would've been able to better appropriate the contingency approach. (HP01)*

It was also acknowledged by health professionals in group B that over the weeks the tokens have gained a lot of importance among the participants. For example, they would remind the health professionals to not forget to bring the tokens during the next session.

*I would say it took a few weeks before the tokens gained importance in my group, but after a certain time they [participants] were more attached to them and they even reminded me to not forget to bring them the next week. (HP03)*

It even went to the point where the patients did not want to part with their tokens after the drawing session, causing the health professionals to adjust the distribution method so that the tokens which the patients wanted to keep were not counted with those accumulated between week 7 and 12. Although the tokens had no value to be exchangeable with a gift, the health professionals construed that the participants viewed them like a representation of success for having started a recovery process.

*At the 6th session, when I asked them [the participants] to give me back the tokens they didn't want to. I think the tokens had some symbolic meaning for the participants, an evidence for them to have started something positive, their recovery process. (HP04)*

On the other hand, the health professionals in group A commented that some of the participants didn't want to receive the tokens. In fact, they didn't associate the tokens with a symbol like those in group B and preferred the amount of tokens to be entered on the attendance list instead. Nevertheless, the health professionals in group A and B recognized that more emphasis could have been made about the contingency management both during the group sessions and the individual meetings because the patients didn't talk about the contingency management as much as they thought they would.

*In my group, they [participants] didn't want the tokens. They didn't see*

*an interest to keep the token; they wanted me to keep the track for them on the attendance sheet. (HP01)*

Finally, clinicians expressed their dissatisfaction with the reward given as compensation for the study (CAN 20\$) because, as they expected, patients were challenged with receiving a cash compensation linked with their craving to use substances.

*My patient refused to participate in the last focus group because she was scared to spend the 20\$ on substance use and relapsing like it was the case after the first discussion group. (HP04)*

#### 4.2.2. Participants' perspective on the acceptability of the contingency management

Participants' perspective on the contingency management components was explored separately for group A and group B at the end of their group therapy in week 12.

4.2.2.1. *Participant's perspective in group A.* Some participants expressed feeling infantilized at the beginning of the contingency management introduction.

*I found the approach a bit childish, but not to the point of being insulted, because it was done in a context of confidentiality, respect, and security, in a therapeutic setting, which I appreciated. (P03)*

However, some of them still appreciated the tokens because it made them realize they were doing the right thing and allowed them to concretely see the results of their efforts.

*I was glad to receive the chips. I kept them in my room where I had given them a special place in my wardrobe. (P02)*

4.2.2.2. *Participant's perspective in group B.* Some of the participants said that rewarding and quantifying their presence to the groups with the tokens was properly integrated with the therapeutic setting, and it made them more optimistic to have a material representation of their progress.

*Receiving the chips at the beginning of each session made me realize that I was in the right place and doing the right thing. (P12)*  
*I physically see the token that I have and it makes me happy. (P12)*  
*For my part, the rewards were alright and they fitted perfectly with the frame. (P09)*

Different participants reported however that the tokens had little symbolic value to them.

They asserted that the tokens were not personalized which made them cumbersome and easy to lose.

*It's bulky and they are not personalized. It's an object, which in fact is connected to nothing concrete, and we can lose them too. (P10)*

Finally, a participant shared that her reality as a drug addict wasn't consistent with the way the tokens were distributed. In effect, she opined that her substance use problem accustomed her to get things in a

short period of time, which didn't make it easy for her to wait 6 weeks for the drawing session.

*I would have liked to dip draw right after having 4 tokens, it makes more sense in my head to get something right now instead of waiting six weeks...probably I think like that because I'm a drug addict. (P12)*

#### 4.3. Feasibility

Contingency management feasibility was explored with health professionals through individual interviews and focus groups. During the first consultations, health professionals have been reluctant to cope with the additional workload represented by the addition of this modality.

*What bugs me is the part that says that it takes time to go shopping [for the gifts]. I could go but in a context where I have an amount of work to do, I would have to take time in my schedule to go shopping. (HP01)*

After having experienced the intervention, the health professionals consulted during the last discussion group reported being surprised by the little effort it took to implement the new modality. Health professionals predominantly relied on the fact that the implementation of the tokens and the attendance list in their therapeutic group were not grueling tasks.

*In terms of management it didn't take me a lot of my time during the sessions, time to make an X on my sheet and that's it. (HP01)*

In the perspective of improving the implementation, health professionals reported that 12 weeks were not enough to incorporate the contingency management and implement it optimally in the groups. Furthermore, as the co-investigator conducted the drawing sessions and the purchase of gifts they felt that they hadn't had an active participation in its implementation. However, they agreed to pursue the implementation over a longer period of time with different therapeutic modalities and integrate it to the patient's treatment plan so both the health professionals and the patients could internalize the approach.

#### 4.4. Benefits and disadvantages

The use of reinforcers had the expected benefit of supporting attendance of participants in therapeutic groups. The participation rate was measured during the regular sessions as well as for the drawing sessions. Participants from both groups present different patterns of attendance. Participants in lower functioning group (group A) showed a rate of attendance of 50% during all the sessions and a lower rate of attendance (40%) at the drawing sessions. At the opposite, participants in higher functioning group (group B) showed a rate of attendance of 75% during all the sessions and a higher rate of attendance (84%) at the drawing sessions.

Both health professionals and patients agreed that the rewards distributed during the study raised the awareness of having a good adherence to treatments offered at the COD clinic. However, health professionals felt that the approach did not directly enhance group attendance.

*I don't really think it [the contingency management] had an impact on their attendance to the group because the identification of their goals regarding their substance abuse and their mental illness were clearly defined. (HP04)*

##### 4.4.1. Participants' perspective in group A

On patients' side, in addition to a higher awareness related to their adherence to treatment, they also reported other benefits. Indeed, patients reported that when they received their rewards, they felt joy and

frenzy.

*Receiving prizes brought me a feeling of happiness. (P01)*

*I felt frenzy toward the prizes because I found it interesting to be rewarded for my presence in the group. (P03)*

They also reported that the rewards helped to increase the motivation they already had, because they felt even more optimistic about coming to the meetings.

*Here it's a new team that follows me and the group is very interesting, making it pleasant to come. The reinforcers have just increased the motivation I had. (P02)*

##### 4.4.2. Participants' perspective in group B

Participants from group B experienced many benefits from the CM approach; one of them was an increased sense of belonging in the group.

*It's rare that I adapt to a group, because I consider myself a loner, a rebel...but I think this is one of the few times I can fit in with a group. (P14)*

Despite the fact that patients appreciated receiving rewards for their presence to therapeutic groups, they acknowledged that their intrinsic motivation to show up during the sessions was independent from the reinforcers. Some mentioned optimism as a motivator to come to the groups, and others mentioned a desire to recover or an aim to reconnect with a loved one that has been lost from sight. In short, the contingency management was a bonus to the achievement of their goal.

*Tokens didn't motivate me to come, because my first goal was my recovery. It's like the cherry on the Sunday, the cherry being the gifts and the Sunday the recovery. (P12)*

*What motivates me is my daughter that I have not seen since sixteen years now, and my biggest dream is to see her again and hug her in my arms without being under the influence of drugs. (P14)*

Patients reported that receiving a token made them realize that they were not habituated to receive a reward.

*I found it interesting to reward good behavior with the contingency approach, because for me, as a drug consumer, I tend to punish myself when the things are not going well rather than put emphasis on my good shots. (P12)*

*I'm an addict who grew up exposed to violence, so I never learned how to receive any gift. The reinforcers took me back to childhood and made me appreciate having gifts. (P14)*

Beyond the reported benefits, patients also expressed disadvantages related to the contingency management as it was applied. Many participants expressed that the absence of the incentive when they missed a session was perceived as a negative reinforcer. For some, the loss of tokens had accentuated their disappointment of having missed a meeting so much that they couldn't appreciate the reinforcers anymore, it had strengthened the trait of perfectionism that was already causing suffering. They explained their depreciation by saying that they felt a lot of stigma during the drawing sessions, since the number of tokens they had indirectly exposed to others in the group the number of absences they had had.

*It's like carrying a weight and at the same time having your absence being framed in front of everyone at the last meeting during the drawing. (P08)*

## 5. Discussion

In the present pilot study, the aim was to assess the implementation of the contingency management within a COD clinic providing services to a clientele with substance use and psychiatric disorders. More specifically, this study aims to assess the acceptability, the feasibility and process indicators of the implementation of the contingency management. The discussion groups made with health professionals on their preconceptions about the contingency management highlighted several facilitators and obstacles to its implementation. As well, discussion groups with patients allowed to identify their preferences for the reinforcers and later the perceived benefits of the approach.

The content analysis of discussion groups and individual interviews yielded three main ideas. First, health professionals expressed some reluctance towards certain aspects of the approach, which finally lead to a more context-adapted intervention. Secondly, patients in group A had a different experience with the approach than patients in group B, which was shown both by their actual participation and by their post-intervention feedback. Thirdly, the nature of the reinforcer influenced its acceptability both for health professionals and for patients, and must be considered carefully when implementing the contingency management.

### 5.1. Appropriation by health professionals

In the beginning of the study, the health professionals expressed a low acceptability level regarding the contingency management through a low overall interest in its use and some specific reluctances: fear of misuse of reinforcers by patients, discomfort in having to pay patients to come to their own therapy, and the additional time and workload for planning and purchase of reinforcers. These reluctances were considered in the planning of the implementation and lead to a context-adapted intervention, expressed by a choice of reinforcers that they considered acceptable, as well as help by the co-researcher to facilitate the first-time use of the approach. Consequently, the health professionals considered feasible the implementation and were open to experiment its possible benefits.

Counselors play a critical role in whether an intervention is chosen or not, and their decision is highly affected by their attitudes and their beliefs toward that method (Aletraris, Shelton, & Roman, 2015). As previously mentioned, contingency management is not known to be highly acceptable by clinicians. Aletraris et al. (2015), in their recent survey questioning 731 health professionals about their perception of the contingency management, found that according to them, it is the least acceptable intervention in their therapeutic tools. This study concluded that diffusion and implementation of contingency management can be challenging and that exposition and training can change clinicians' perception and acceptability. An earlier study by Srebnik et al. (2013) examined views about CM among 80 clinicians and 29 clients specifically with co-occurring mental health and substance use disorders in community mental health centers. It was found that three-quarters of clinicians would use CM if funding were available and that both clinicians and clients found that incentives enhance abstinence motivation. Other findings were that CM acceptability was related to greater years of experience, and identifying as an addictions or co-occurring disorders counselor, more than a mental health clinician. In our study, clinicians' openness to be exposed to this approach allowed its experimentation. What's more, a collaborative approach was used from the beginning of the implementation to involve clinicians and take into account their clinical judgement and experience in the conceptualization of the intervention. Their preoccupations and needs assessment were considered in the planning of the implementation, leading to a context-adjusted intervention acceptable enough to do a pilot study.

The health professionals expressed that the implementation was feasible since they didn't manage the reward system as most of the preparation was done by one of the researchers. On the one hand, they

found that it was not as time-consuming as they had first thought. On the other hand, some of them expressed that they could have further promoted the contingency management during the recruitment process if they had been more involved in the organisation, planning and conduct of it. At the end, they reported that they need to play a larger role in the planning and distribution of the prizes, as well as maintaining the approach over a longer period of time to feel competent in its use.

### 5.2. Patient's experience

Before the implementation process, acceptability for patients of group A and B was sufficient, as they didn't expect any disadvantages related to receiving rewards. All patients said that they were already motivated and didn't have much confidence in the impacts of the approach on their group attendance.

The intervention was applied entirely as planned in both groups but was not completed as expected for group A, as the participants did not show up for the final drawing session. Group leaders reported that patients in their group had different reactions to the contingency management. Patients in group A did not want to keep their tokens and talked about it as a nuisance, while patients in group B talked about the tokens as symbols and wanted to keep them even after the drawings.

In the final discussion group, patients themselves reported a different experience depending on which group they belonged to. Patients in group A reported according little significance to the reward, came about one half of the time to sessions, and even forgot their drawing session. On the contrary, patients in group B expressed being surprised at the importance that the tokens and the rewards had for them. The perceived importance was so high that when they did not receive a token because they missed a group session, they saw it as a punishment. The clinicians linked the difficulty to implement the approach with group A with the patient's lower level of daily functioning the patients. Indeed, patients in group A presented a housing and financial precariousness that can point to difficulties to integrate new habits, to respect commitments and respect a schedule.

Previous studies on the use of the contingency management with populations presenting severe mental illnesses and functional difficulties (Bellack, Bennett, Gearon, Brown, & Yang, 2006; McDonnell et al., 2013) report the efficacy of the approach to reduce costs for optimal benefits. Therefore, the difficulties encountered by patients in group A to benefit from the approach do not invalidate its efficacy with this population, but rather highlight an implementation gap. This gap could be minimized by taking into account patients' difficulties when adapting the approach, such as reexamining the timing and nature of all reinforcers. This pilot study raises awareness that for some vulnerable populations, a more patient-adapted implementation could be necessary, such as an immediate and systematic reinforcer, which takes into account the difficulties of observance to treatment (McPherson et al., 2018).

Contrastingly, patients in group B show an higher rate of attendance to sessions, were present to both drawing sessions and reported a positive experience with the approach. This group was composed of patients presenting a higher functioning level, all of which had common mental disorders (personality disorders, anxiety and mood disorders, ADHD). As previously mentioned, this population was not considered in most CM studies for dual diagnosis. The present pilot study suggests a promising avenue for future CM research specifically with dual diagnosis of substance use and common mental disorders.

### 5.3. Representation of the reinforcer

The selection of the reinforcers was done by consulting the health professionals and then the patients, as it influenced the acceptability of the approach altogether. For the health professionals, not all reinforcers were acceptable. They stated that it's important for them not to

compromise patients' safety and treatment by giving them a monetary prize or a great value prize (exchangeable for drugs).

On the patients' side, they did not see how an external reinforcer could increase their motivation, but reported that it makes sense for their rehabilitation process when the reinforcer is in line with their recovery objectives (eg: community integration reinforcer like fitness subscription).

By conducting preliminary focus groups in the present study, participants' interests could be identified and integrated into the contingency management in order to facilitate the implementation and increase their adherence to treatment. The identification of participants' and health professionals' perception during the implementation of the contingency management contributed to understand the importance of putting the patient in the center of the intervention in order to optimise his or her adherence to treatment.

#### 5.4. Strengths and limitations

The main limitation of this study lies in the fact that the planning and execution of the contingency reward system (i.e. purchase of rewards, planning and leading drawing sessions) were made by the research assistant in order to facilitate the task of health professionals. Thus, they were unable to feel fully involved in the process; they named this limit and talked about the need to go through all the steps themselves if they had to do it again. Although acceptability was assessed in depth throughout the process, the information about feasibility is therefore limited by the fact that the researchers have replaced some of the tasks normally assigned to the stakeholders. In order to study the successful and long-term implementation of the contingency management, health professionals should be further accompanied in the development of their autonomy in its application.

Another limitation of this pilot study is its small number of participants for which statistical comparisons are not possible. However, differences were observed in the qualitative and quantitative data from the two groups composed of participants at different functioning levels (high functioning and low functioning). In order to test the emerging hypothesis of a significant difference on possible benefits from the approach between people with a low or a high level of functioning, a study with a larger number of participants including quantitative functional outcomes is necessary. Furthermore, the qualitative information obtained in this study is useful for planning future research as it points out some of the outcomes that are significant to the participants themselves, such as motivation during treatment.

#### 6. Conclusion

Implementation studies provide an in-depth analysis of the factors influencing the potential use of an approach, for the ultimate purpose of bringing benefits to people with health problems. The contingency management is known for implementation issues linked to its acceptability and feasibility, limiting its clinical use despite the known efficacy for various populations. It was therefore important to assess the implementation process in a clinical setting aiming to implement all best practices in its field that hadn't yet used the approach.

A largely facilitating step in the implementation of the contingency management intervention was to let the health professionals and participants adapt it to their preferences, simultaneously giving important information about what made it acceptable and feasible in their clinical setting. Nevertheless, it is important to adapt the approach to the participants' profile in order to maximize its benefits. Indeed, this study has taught us that people with a higher functional level were better able to benefit from the intervention, perhaps because despite the spaced runs between drawings, they did not lose sight of their therapeutic goals. Similarly, people with a low level of functioning would have benefited from having their attendance rewarded at each session.

In conclusion, a main course of action guiding the implementation

of the contingency management is tailoring it according to the particular context in which it will be used and the population with which it will be implemented.

#### Declaration of Competing Interest

All authors declare that they have no conflict of interest.

#### Appendix A. Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.abrep.2019.100223>.

#### References

- Aletraris, L., Shelton, J. S., & Roman, P. M. (2015). Counselor attitudes toward contingency management for substance use disorder: Effectiveness, acceptability, and endorsement of incentives for treatment attendance and abstinence. *Journal of Substance Abuse Treatment*, 57, 41–48. <https://doi.org/10.1016/j.jsat.2015.04.012>.
- Bellack, A. S., Bennett, M. E., Gearon, J. S., Brown, C. H., & Yang, Y. (2006). A randomized clinical trial of a new behavioral treatment for drug abuse in people with severe and persistent mental illness. *Archives of General Psychiatry*, 63(4), 426–432. <https://doi.org/10.1001/archpsyc.63.4.426>.
- Benishek, L. A., Dugosh, K. L., Kirby, K. C., Matejkowski, J., Clements, N. T., Seymour, B. L., & Festinger, D. S. (2014). Prize-based contingency management for the treatment of substance abusers: A meta-analysis. *Addiction*, 109(9), 1426–1436. <https://doi.org/10.1111/add.12589>.
- Bowen, D. J., Kreuter, M., Spring, B., Cofta-Woerpel, L., Linnan, L., Weiner, D., Bakken, S., Kaplan, C. P., Fabrizio, L., Squiers, C., & Fernandez, M. (2009). How we design feasibility studies. *American Journal of Preventive Medicine*, 36(5), 452–457. <https://doi.org/10.1016/j.amepre.2009.02.002>.
- Carroll, K. M. (2014). Lost in translation? Moving contingency management and cognitive behavioral therapy into clinical practice. *Annals of the New York Academy of Sciences*, 1327(1), 94–111. <https://doi.org/10.1111/nyas.12501>.
- Drake, R. E., Essock, S. M., Shaner, A., Carey, K. B., Minkoff, K., Kola, L., ... Rickards, L. (2001). Implementing dual diagnosis services for clients with severe mental illness. *Psychiatric Services*, 52(4), 469–476. <https://doi.org/10.1176/appi.ps.52.4.469>.
- Drake, R. E., Luciano, A. E., Mueser, K. T., Covell, N. H., Essock, S. M., Xie, H., & McHugo, G. J. (2016). Longitudinal course of clients with co-occurring schizophrenia-spectrum and substance use disorders in urban mental health centers: A 7-year prospective study. *Schizophrenia Bulletin*, 42(1), 202–211. <https://doi.org/10.1093/schbul/sbv110>.
- Dubreucq, S., Chanut, F., & Jutras-Aswad, D. (2012). Integrated treatment of co-occurring mental and substance use disorders in urban populations: The situation in Montreal. *Sante Mentale au Quebec*, 37(1), 31–46. <https://doi.org/10.7202/1012642ar>.
- Dutra, L., Stathopoulou, G., Basden, S. L., Leyro, T. M., Powers, M. B., & Otto, M. W. (2008). A meta-analytic review of psychosocial interventions for substance use disorders. *American Journal of Psychiatry*, 165(2), 179–187. <https://doi.org/10.1176/appi.ajp.2007.06111851>.
- Forman-Hoffman, V. L., Batts, K. R., Hedden, S. L., Spagnola, K., & Bose, J. (2018). Comorbid mental disorders among adults in the mental health surveillance survey. *Annals of Epidemiology*, 28(7), 468–474. <https://doi.org/10.1016/j.annepidem.2018.03.002>.
- Fridell, M., & Nilson, M. (2004). La comorbidité-Consommation de drogue et troubles Psychiatriques [Comorbidity-Drug Use and Disorders Psychiatric]. *Objectif drogues. Briefing de l'Observatoire européen des drogues et des toxicomanies. EMCDDA*.
- Gallagher, F. (2014). La recherche descriptive interprétative: description des besoins psychosociaux de femmes à la suite d'un résultat anormal à la mammographie de dépistage du cancer du sein [Interpretative descriptive research: description of the psychosocial needs of women following abnormal screening mammography screening mammography]. Dans M. Corbières et N. Larivière (dir.), *Méthodes qualitatives, quantitatives et mixtes: dans la recherche en sciences humaines, sociales et de la santé* (p. 5–28). Québec, Qc: Presses de l'Université du Québec.
- Garner, B. R., Godley, S. H., Dennis, M. L., Hunter, B. D., Bair, C. M., & Godley, M. D. (2012). Using pay for performance to improve treatment implementation for adolescent substance use disorders: Results from a cluster randomized trial. *Archives of Pediatrics & Adolescent Medicine*, 166(10), 938–944. <https://doi.org/10.1001/archpediatrics.2012.802>.
- Helmus, T. C., Saules, K. K., Schoener, E. P., & Roll, J. M. (2003). Reinforcement of counseling attendance and alcohol abstinence in a community-based dual-diagnosis treatment program: A feasibility study. *Psychology of Addictive Behaviors*, 17(3), 249–251. <https://doi.org/10.1037/0893-164X.17.3.249>.
- Kellogg, S. H., Stitzer, M. L., Petry, N. M., & Kreek, M. J. (2007). Contingency management: Foundations and principles. Unpublished chapter.
- Kelly, T. M., Daley, D. C., & Douaihy, A. B. (2014). Contingency management for patients with dual disorders in intensive outpatient treatment for addiction. *Journal of Dual Diagnosis*, 10(3), 108–117. <https://doi.org/10.1080/15504263.2014.924772>.
- Ledgerwood, D. M., Alessi, S. M., Hanson, T., Godley, M. D., & Petry, N. M. (2008). Contingency management for attendance to group substance abuse treatment administered by clinicians in community clinics. *Journal of Applied Behavior Analysis*, 41(4), 517–526. <https://doi.org/10.1901/jaba.2008.41-517>.



- Love, A. (2004). Implementation evaluation. In J. S. Wholey, H. P. Hatry, & K. E. Newcomer (Eds.). *Handbook of practical program evaluation* (2nd ed.). San Francisco, CA: Jossey-Bass.
- McDonell, M. G., Leickly, E., McPherson, S., Skalisky, J., Srebnik, D., Angelo, F., ... Ries, R. K. (2017). A randomized controlled trial of ethyl glucuronide-based contingency management for outpatients with co-occurring alcohol use disorders and serious mental illness. *American Journal of Psychiatry*, *174*(4), 370–377.
- McDonell, M., McPherson, S., Vilardaga, R., Srebnik, D., Angelo, F. N., Leickly, E., ... Ries, R. (2014). Preliminary findings: Contingency management targeting psycho-stimulant use results in secondary decreases in smoking for severely mentally ill adults. *The American Journal on Addictions/American Academy of Psychiatrists in Alcoholism and Addictions*, *23*(4), 407. <https://doi.org/10.1111/j.1521-0391.2013.12114.x>.
- McDonell, M. G., Srebnik, D., Angelo, F., McPherson, S., Lowe, J. M., Sugar, A., ... Ries, R. K. (2013). Randomized controlled trial of contingency management for stimulant use in community mental health patients with serious mental illness. *American Journal of Psychiatry*, *170*(1), 94–101. <https://doi.org/10.1176/appi.ajp.2012.1112183>.
- McKee, S. A. (2017). Concurrent substance use disorders and mental illness: Bridging the gap between research and treatment. *Canadian Psychology/Psychologie Canadienne*, *58*(1), 50–57. <https://doi.org/10.1037/cap0000093>.
- McPherson, S. M., Burduli, E., Smith, C. L., Herron, J., Oluwoye, O., Hirschak, K., ... Roll, J. M. (2018). A review of contingency management for the treatment of substance-use disorders: Adaptation for underserved populations, use of experimental technologies, and personalized optimization strategies. *Substance Abuse and Rehabilitation*, *9*, 43. <https://doi.org/10.2147/SAR.S138439>.
- Mueser, K. T., Noordsy, D. L., Drake, R. E., & Fox, L. (2003). *Integrated treatment for dual disorders: A guide to effective practice*. New York, NY: Guilford Press.
- Najavits, L. M., & Hien, D. (2013). Helping vulnerable populations: A comprehensive review of the treatment outcome literature on substance use disorder and PTSD. *Journal of Clinical Psychology*, *69*(5), 433–479. <https://doi.org/10.1002/jclp.21980>.
- Petry, N. M., Alessi, S. M., Olmstead, T. A., Rash, C. J., & Zajac, K. (2017). Contingency management treatment for substance use disorders: How far has it come, and where does it need to go? *Psychology of Addictive Behaviors*, *31*(8), 897–906. <https://doi.org/10.1037/adb0000287>.
- Petry, N. M., & Simic, F., Jr (2002). Recent advances in the dissemination of contingency management techniques: Clinical and research perspectives. *Journal of Substance Abuse Treatment*, *23*(2), 81–86. [https://doi.org/10.1016/S0740-5472\(02\)00251-9](https://doi.org/10.1016/S0740-5472(02)00251-9).
- Petry, N. M., Weinstock, J., & Alessi, S. M. (2011). A randomized trial of contingency management delivered in the context of group counseling. *Journal of Consulting and Clinical Psychology*, *79*(5), 686–696. <https://doi.org/10.1037/a0024813>.
- Peirce, J. M., Petry, N. M., Stitzer, M. L., Blaine, J., Kellogg, S., Satterfield, F., ... Kirby, K. C. (2006). Effects of lower-cost incentives on stimulant abstinence in methadone maintenance treatment: A National Drug Abuse Treatment Clinical Trials Network study. *Archives of General Psychiatry*, *63*(2), 201–208. <https://doi.org/10.1001/archpsyc.63.2.201>.
- Rush, B., & Koegl, C. J. (2008). Prevalence and profile of people with co-occurring mental and substance use disorders within a comprehensive mental health system. *The Canadian Journal of Psychiatry*, *53*(12), 810–821. <https://doi.org/10.1176/appi.ps.55.4.445>.
- Srebnik, D., Sugar, A., Coblentz, P., McDonell, M. G., Angelo, F., Lowe, J. M., ... Roll, J. (2013). Acceptability of contingency management among clinicians and clients within a co-occurring mental health and substance use treatment program. *The American Journal on Addictions*, *22*(5), 432–436.
- Vandrey, R., Stitzer, M. L., Acquavita, S. P., & Quinn-Stabile, P. (2011). Pay-for-performance in a community substance abuse clinic. *Journal of Substance Abuse Treatment*, *41*(2), 193–200. <https://doi.org/10.1016/j.jsat.2011.03.001>.
- Walker, R., Rosvall, T., Field, C. A., Allen, S., McDonald, D., Salim, Z., ... Adinoff, B. (2010). Disseminating contingency management to increase attendance in two community substance abuse treatment centers: Lessons learned. *Journal of Substance Abuse Treatment*, *39*(3), 202–209. <https://doi.org/10.1016/j.jsat.2010.05.010>.
- World Health Organization. (2003). Adherence to long-term therapies: evidence for action. Geneva, Switzerland: World Health Organization. Contract No.: ISBN, 92(4), 154599.