NEW RESEARCH SUBSTANCE USE

Combining Motivational Interviewing and Cognitive Bias Modification Training for Substances in Detained Youth

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Objective: Motivation is considered a key factor in successful treatment. Unfortunately, detained youth typically show lower motivation for treatment and behavioral change. This pilot study examined the effects of a brief Motivational Interviewing (MI) protocol in conjunction with a Cognitive Bias Modification (CBM) intervention aimed at reducing substance use in detained youth.

Method: An MI protocol for adult parolees was adapted for adolescents. A total of 52 detained youth received the MI intervention, aimed at enhancing their insights into their substance use and its potential relation with their offenses, plus substance use treatment. These youth were matched with controls from similar populations who received the same CBM without MI.

Results: Changes in motivation over time were examined with a repeated-measures analysis of variance. Results showed no change in motivation over time, nor a significant effect of condition (MI vs no MI).

Conclusion: Although application of the MI protocol was feasible, no effect was found on motivation, in contrast to the original adult-focused protocol. Certain core facets of the original protocol, such as client reflection on their history of substance use, may be less applicable to detained youth whose use history is relatively brief. The severity of their substance use behavior should also be taken into account in any future applications.

Plain language summary: Motivational interviewing (MI) is an evidence-based method to increase behavioral change and treatment engagement. In this study, 52 detained youth received a 6 session MI protocol in addition to a cognitive bias modification (CBM) intervention targeting substance use, and they were matched with controls from a prior study where youth received CBM only. Neither group showed a change in motivation. These findings suggest that future MI-based interventions should consider the needs and developmental stages of youths with substance use.

Key words: young offenders; motivational interviewing; substances

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Client motivation plays a pivotal role in mental health treatment,[1–3] being predictive of treatment retention and outcomes.[4–7] Creating and sustaining motivation is a recurring challenge for practitioners, particularly in forensic settings. Involuntary treatment is considered less effective,[8–10] yet successful treatment in forensic populations is greatly beneficial, both to the individual and to society. This is particularly true with detained youth,[11] who may potentially desist from continued involvement with the legal system. Motivation in detained youth is therefore of primary consideration for clinicians in treatment planning,[12] and effective motivation enhancement is needed.

Detained youth are often assumed to have little motivation for their treatment.[13] Optimally, motivation for engaging in treatment and/or behavioral change should be intrinsic or autonomous.[14] Adolescents in general derive motivation from personal relevance and perceived effects on social status, rather than long-term societal benefits.[15,16] Detained youth typically have little to no autonomy in the decision to be treated or in the treatment selection. Unlike typical clinical populations, they have not arrived at treatment after a process of deliberation or because of problem recognition. Treatment initiation is highly controlled and engagement enforced extrinsically, as cooperation is often linked to privileges (or lack thereof) during detention. Moreover, their direct peers are other detained youth who may not react positively to cooperation with authority. This has a negative impact on motivation in what is already a suboptimal treatment environment.[17]

The most common conceptualization of motivation in clinical context is the Transtheoretical Model (TTM)[18] of behavior change. The TTM sees motivation both as the initial motivation at treatment commencement and as a continuous factor throughout the process, as clients progress through 6 sequential stages. The first stage is Precontemplation, in which individuals do not intend to take action toward behavior change, at least not in the next 6

months. Next is Contemplation, in which current behavior is recognized as problematic and the pros and cons of change are considered, although there may still be ambivalence. Following that is the Preparation, or Determination, stage, in which concrete plans are made to effect behavior change within the next month. Afterward comes the Action stage, in which behavior change is implemented; and finally Maintenance, which is concerned with the prevention of relapse. Progression through the stages is equated with greater motivation for treatment engagement and behavioral change.

However, treatment duration for detained youth is based on sentence, rather than treatment protocol. In the United States, most adjudicated youth are detained for less than 3 months, with a median stay of 30 days.[19] Although committed youth are detained for longer (median = 117 days),[19] this is still a limited amount of time in which to execute a complete treatment protocol. In the Netherlands, where this study took place, the average detention length is comparable to that in the United States.[20] As they are expected to enter the Action stage post-detention (ie, upon release they are expected to refrain from illegal behavior), most committed youth will not have enough time to progress through Contemplation, which can take up to 6 months, and detained youth would need to be sufficiently motivated to enter the Preparation stage upon placement in the detention center. As it is unlikely that the youth are already this motivated upon adjudicated placement, it greatly reduces the odds of success during the Action stage.[18]

Despite these challenges, providing detained youth with the most positive treatment experience possible offers significant benefits. Detention placement provides an opportunity for clinicians to turn disinterest in treatment, or even outright opposition to treatment, into ambivalence. If youth progress through the Precontemplation stage or even farther, and leaves detention with a sense of personal relevance regarding treatment, they may retain that motivation and seek out further treatment or otherwise effect positive behavioral change themselves. Thus, involuntary treatment settings still benefit from effective motivation enhancement methods.

One method that has been frequently applied with youth in forensic settings[21] is Motivational Interviewing (MI).[22] MI is a therapeutic communication style designed to explore and resolve ambivalence regarding behavioral change. By focusing on intrinsic motivation and building self-efficacy, MI aims to support positive behavioral change. Numerous studies have found that applying MI principles can increase motivation in detained youth and can effect behavioral change in various health behavior domains.[23–29] Although not all studies show an effect of MI on behavior changes,[30–33] MI is one of the best validated methods to increase motivation in this demographic.

This article outlines the findings of a pilot study in which a modified MI protocol, originally designed to enhance motivation for substance use change in adult parolees, was added to a Cognitive Bias Modification (CBM) intervention targeting substance use in detained youth. These populations show high levels of substance use[34,35] and are at increased risk for developing substance use disorders.[36,37] This is a major concern in forensic care.[38,39] CBM interventions are brief, computerized training programs that target cognitive biases: cue processing predilections in which specific behavioral responses are triggered by specific cues, implicated in the development and maintenance of substance use disorders.[40,41] During CBM interventions, participants are exposed to cues that typically precede the targeted behavior (eg, substance use) and respond with non-initiation behavior (eg, disengage their attention from cannabis). Through frequent repetition, the association between cues and behavior engagement is decreased, thereby weakening the response. Its relatively brief time frame and action-oriented format makes CBM potentially very suitable for detained youth.

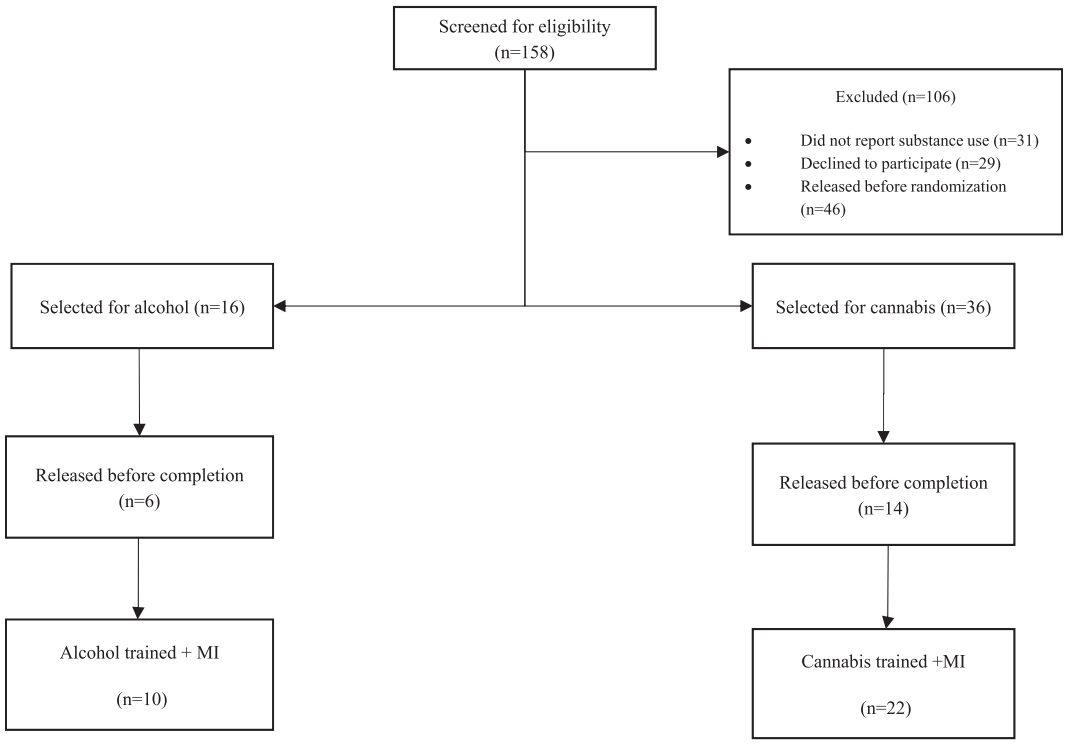
Recent developments in the field indicate that CBM is primarily effective in abstinence-oriented volunteers.[42] As detained youth have not voluntarily sought out treatment and are unlikely to have formed abstinence-related goals, they would benefit from motivation enhancement. MI protocols have been shown to have a significant effect on substance use, and although it is unclear whether there are differential effects for different substances, a systematic review found significant heterogeneity between various substances-targeted MI studies.[43] The goal of the current study was to test whether adding the MI protocol to an existing CBM trial would be effective in increasing motivation and reducing substance use in detained youth. It was hypothesized that participants receiving MI would increase in motivation, compared to detained youth who did not receive MI. Motivation was the primary outcome, as the objective of the MI protocol applied is to increase motivation toward behavioral change, not to achieve behavioral change itself. It was further hypothesized that the MI group would show a greater reduction in substance use, and that the effect of CBM on substance use would be mediated by the increase in motivation.

METHOD

Pilot Design

This study was a continuation of the CBM trial conducted by van der Baan *et al.*[42] The CBM portion of the study consisted of a double-blind, 2 × 2 factorial design.

FIGURE 1 CONSORT Flow Diagram



Participants were detained youth who were screened and assigned to either an alcohol or a cannabis intervention, depending on which substance they used most. The CBM protocol consisted of 2 tasks (attentional-bias and approach-bias focused), randomly determined to be either a training or sham task. Participants were also guided through an MI-based, 7-step protocol (outlined below) exploring their substance use development and its link with antisocial behavior. The first 6 steps of the MI-protocol were paired with one of the CBM sessions, whereas the seventh step was done separately.

Study protocols were approved by the University of Amsterdam Faculty of Social and Behavioural Sciences Ethics Committee (UvA-FMG, 2013-DP-3165; 2013-DP-3142). The project was funded by the Dutch Ministry of Justice and Safety, who had no role in study execution, data collection or analysis, or writing this manuscript.

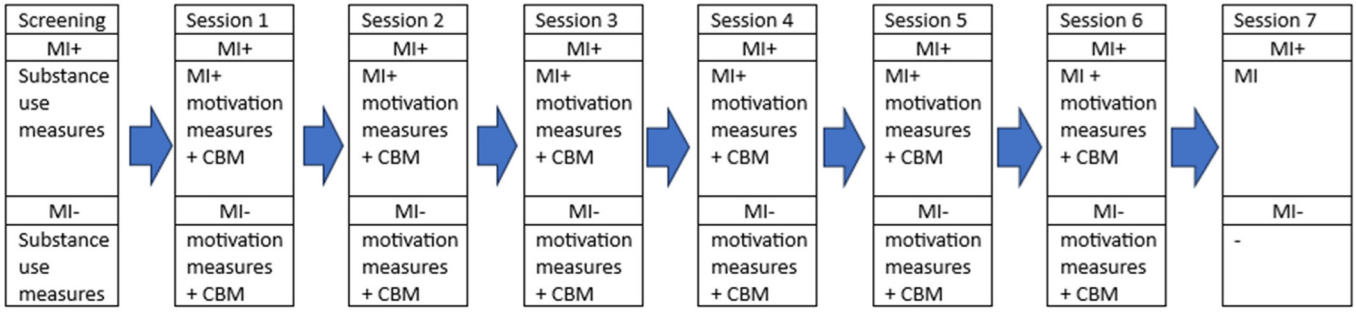
Participants

Participants were 158 adolescents from 5 juvenile detention centers in the Netherlands, including both detained youth (awaiting court dates or pending placement in longer-term locations) and committed youth (adjudicated to longer placement). Youth were adjudicated after a juvenile court conviction of a felony or while awaiting trial. Participant recruitment ran from 2016 to 2017. The selection process consisted of 2 phases: (1) invitation through in-person communication; and (2) an eligibility assessment (T0). Exclusion criteria were placement in Very Intensive Care or Forensic Observation groups, as these house youth with severe and chronic psychiatric disorders; and insufficient mastery of the Dutch language.

Procedure

Recruitment and data collection was performed by university-affiliated researchers on-site. A Consolidated Standards of Reporting Trials (CONSORT) flow diagram is presented in Figure 1. Candidates were approached after at least 2 weeks of detention. This first period is filled with acclimatization and the administration of various intake instruments by the institution. To ensure that the youth knew that the study was independent from the institution, they were approached only afterward. Participants were told that the aim was to obtain information on their behavior from the youth themselves, and that every detained youth would be approached; they were not singled out. Information about the study was given verbally and via brochure, which they could review in their cells. Consent for participation and anonymous publication was obtained from the youth and, if they were younger than 18 years, parents or guardians. The test battery, which included the Alcohol Use Disorder Identification Test (AUDIT)[44] and the Cannabis

FIGURE 2 Study Procedure



Note: *CBM = cognitive bias modification; MI = motivational interviewing; MI+ = participants who received motivational interviewing; MI− = control group.*

Use Disorder Identification Test—Revised (CUDIT-R)[45] to screen for substance use, was administered 24 hours after consent was obtained. It was digitally administered and took 1.5 to 2 hours. All questionnaires, as well as the CBM tasks, were embedded in software developed by the University of Amsterdam specifically for test administration and data recording purposes. Data were stored on secure servers to which only the researchers had access.

Following screening, eligibility was assessed by the lead researcher off-site. All participants whose AUDIT or CUDIT scores indicated substance use during the previous year were eligible. This is a low inclusion threshold, which was necessary to ensure that third-party observers (eg, institution staff) could not infer specifics regarding substance use from participation, further ensuring confidentiality. Participants were then assigned to CBM targeting the substance for which they reported the highest use levels. Further details regarding randomization within the CBM tasks can be found in the main trial paper.[42]

The CBM intervention consisted of 6 sessions, paired with the sequential steps of the MI protocol. At the start of each session, participants reported their motivation for participating in the CBM intervention and for reducing their substance use. After these 6 sessions, the MI protocol concluded with a seventh session during which no data were collected. Figure 2 provides an overview of this process. Sessions were scheduled at least 24 hours but no more than 1 week apart. The sessions took place in a designated room within the facility, with only the participant and the data collector present.

For the screening, participants were given a choice of compensation worth approximately 5 Euros. The most commonly chosen compensations were phone credits or personal hygiene products. The exact items varied by institution, but their value did not. There was no compensation tied to intervention participation, which therefore carried no extrinsic rewards.

Materials

CBM Tasks. Two CBM tasks were used that targeted different biases: an approach bias retraining based on the Approach–Avoid task (AAT); and an attentional bias retraining based on a Visual Probe Task (VPT). Both tasks used a mix of neutral stimuli (office supplies) and substance-related stimuli. For each task, participants received 1 of 2 versions: a training version (ie, bias retraining) or a sham version (intended not to retrain the bias). Task order was counterbalanced between participants. More detailed descriptions of these tasks can be found in the main trial paper.[42]

MI Protocol. The protocol was based off the Stap-voor-Stap (Step-by-Step) protocol used by the "Stichting Verslavingsreclassering GGZ,"[46] the Dutch mental healthcare department that handles post-incarceration care of former detainees whose parole includes (continued) addiction treatment. Stap-voor-Stap is a brief sequential protocol based on the principles of Motivational Interviewing[22] to increase motivation for behavior change. It guides clients through the first stages of the behavioral change model (precontemplation, contemplation, preparation/determination). The purpose of the protocol is to aid the client in exploring, to provide an overview of the link between their addiction and antisocial behavior, and to help them arrive at a decision regarding abstinence. The original protocol consists of 7 steps, during which clients perform assignments and answers questions to increase insights into their antisocial behavior and its link with their substance use history. Stap-voor-Stap is designed for adults and, as such, required some adaptation for use with youth. It was also geared toward general addiction (including gambling). For this study, the formulations were changed to be substance use–specific. Each step of the module will be outlined below, along with any adaptations that were made from the original. Participants received a Stap-voor-Stap workbook,

in which they took notes and answered questions. The workbooks were their personal property, which they could take with them to their cells.

The first step was a program introduction for the youth, and a brief self-assessment of their current situation. They were asked to relate, in their own words, what the verdict was in their court case, as well as their thoughts and feelings about that verdict and their detention.

During the second step, clients were invited to think about their current substance use, antisocial behavior, and any problems that they experienced in their general day-to-day life. In adjusting the protocol, it was made explicit that they should think about their substance use behavior outside of the detention center. The day-to-day areas were also adjusted by removing marriage (asking instead about romantic relationships) and making school more prominent.

In the third step, participants were asked to indicate on a graph plot, presented on a transparent sheet in the workbook, their substance use at various ages. Next, on a graph plot presented on a different (opaque) page, they graphed their antisocial behavior during the same period. The transparent page could then be placed on top of the opaque page so that both progression lines were visible. Participants were asked to reflect on what they saw, and any possible relations between the 2 graphs. Next, they would think about their day-to-day life each age, and reflect on problems that they did or did not encounter in times of little substane use, heavy use, and lessened or increased antisocial behavior, based on what was graphed out. As the participants were teenagers, the age ranges displayed on the graph plots were adjusted, changing the range to 9 through 25.

During the fourth step, participants were asked to list advantages and disadvantages of their substance use and antisocial behaviors. They were then asked to imagine changing their substance use and reducing their antisocial behavior, listing advantages and disadvantages of those as well. It is worth noting that the protocol does not explicitly say anything about reducing their substance use or quitting entirely; it is simply there to encourage thinking about behavior change, and letting them draw their own conclusions about what form that change should take.

In the fifth step, participants thought about ways that they could help themselves to change their behavior. They listed potential goals (formulated as agreements made with themselves) that they might reach (eg, no daily drinking, or no stealing from children). They also thought about times when they had achieved such goals, and what traits and strengths had helped.

The sixth step combined the last 2 steps of the original protocol. Like the previous step, clients explored resources that could help them reach behavior change goals. They first examined institutionalized help (eg, detoxification clinics or self-help groups), reflecting on earlier experiences, what was good and what was not, what those sources could do for them now, obstacles, and potential gains. Next, they reflected on the same issues, now regarding sources of aid from their direct environment (outside of detention, eg, family, schools, etc).

These first 6 steps coincided with the 6 sessions of the CBM intervention. Another step was added, called the Future Film.[47] In this session, participants were invited to imagine their future life as a movie, starting with the end: What did the life of the character (ie, their future) look like? What had they achieved? Next, they reflected on the journey: how had they gotten from where they were now, to where they imagined themselves in the film? How had they managed it? What steps could the youth take to achieve the same? This provided a fun, creative session with which to round off the protocol, but also provided opportunity for planning.

The protocol was administered on-site by trained students unaffiliated with the institutions or the legal system. The researchers had received a general training in MI from a professional MI clinician and trainer, as well as specific instruction regarding this protocol.

Alcohol Use. The AUDIT[44] assesses alcohol use and problems, and is a screener of hazardous and harmful alcohol use during the past year. Total scores were used to assess alcohol use at screening.

Cannabis Use. The CUDIT-R[45] assesses cannabis use and problems, and is a screener of potentially hazardous and harmful cannabis use during the past year. Total scores were used to assess cannabis use at screening.

Motivation. Two distinct forms of motivation were measured, using a visual analog scale (VAS) ranging from 0 ("not at all") to 100 ("completely"). Likert scales and VAS show comparable responsiveness,[48] and it was thought that the VAS would better allow detained youth to express how motivated they felt, rather than a reading-oriented Likert scale.[49] There were 2 items. The first item was "Indicate on the line below how motivated you are right now to participate in this training" (referring to the CBM); the second item was "Indicate on the line below how motivated you are right now to quit/reduce (drinking alcohol / using cannabis"; the wording of this part of the item depended on which substance participants were being trained for. The first item purports to measure Treatment Motivation, and the second item Reduction Motivation.

TABLE 1 Sample Characteristics

	Alcohol		Cannabis		Total	
	MI	Control	MI	Control	MI	Control
N	16	16	36	36	52	52
Sex, % male	100	100	91.66	91.66	94.23	94.23
Age, y	18.92 (2.50)	18.88 (2.08)	18.55 (2.00)	18.52 (1.67)	18.66 (2.14)	18.64 (1.79)
AUDIT	6.88 (5.41)	5.02 (2.97)	—	—	5.67 (5.48)	4.88 (4.45)
CUDIT-R	—	—	13.47 (7.36)	12.56 (6.43)	9.87 (8.411)	8.94 (7.69)
Treatment Motivation	67.07 (32.37)	81.37 (20.54)	73.47 (24.36)	67.89 (27.28)	71.68 (26.65)	72.12 (25.93)
Reduction Motivation	51.07 (46.27)	42.25 (41.52)	58.14 (38.70)	53.94 (35.63)	56.16 (40.60)	50.27 (37.56)

Note: Numbers in parentheses are standard errors. AUDIT = Alcohol Use Disorder Identification Test—Revised (range 0-40); CUDIT-R = Cannabis Use Disorder Identification Test (range 0-32); MI = Motivational Interviewing; Treatment Motivation = motivation to engage with the cognitive bias modification (CBM) training (range 0-100); Reduction Motivation = motivation to quit/reduce substance use (range 0-100); Reduction Motivation was formulated to be substance specific (alcohol or cannabis). Both Motivation measures reflect motivation at the start of treatment.

Data Analysis

A control group was created by case-control matching participants with participants from the main trial study.[42] Like the MI-trained youth, these were detained youth from several juvenile detention centers in the Netherlands who underwent the exact same study protocol without the MI intervention. Participants were first matched on age, ethnicity, gender/sex, the institution at which they were detained, and the substance for which they received CBM training. This gave us 38 matches. However, it was found that the MI participants did not differ significantly in age from the full group of potential controls ($t[84] = -0.97$, $P = .12$), and, as such, exact age was dropped as a requirement. Furthermore, as the Netherlands is a small country, it is very common for youth to be detained in a province different from that where they reside. In other words, detention in any given institution is not representative of locality, and thus does not equate to a significantly different population than any other institution. This requirement was also dropped. Matching only on ethnicity, gender/sex, and substance provided matches for all 52 participants.

Sample characteristics are shown in Table 1. Independent-sample t tests showed no significant differences in sample characteristics between the MI and control groups.

Motivation. Change-over-time for both motivation measures was evaluated with a mixed-model analysis of variance (ANOVA), with Time as within-subject factor (comparing item scores at all 6 measurement points) and Condition as between-subjects factor (MI or control), with participant distribution between the conditions being 50-50. Any significant change will be further explored with paired-sample t tests.

Substance Use. Assuming significant improvements in motivation in the MI condition participants, differences in substance use at follow-up were assessed with paired-sample t tests.

CBM Conditions. It was decided post hoc to explore potential differential effects of the CBM tasks. As there are 2 CBM tasks, the Approach–Avoid task (AAT) and the Visual Probe Task (VPT), and as participants received either a training version or a sham version, this created 2 conditions twice, AAT-raining vs AAT-sham, and VPT-training vs VPT-sham. These effects were examined for both motivation measures with mixed-model ANOVAs, with Time (motivation before and after) as within-subject factor, and MI-condition, VPT-condition, and AAT-condition as between-subject factors.

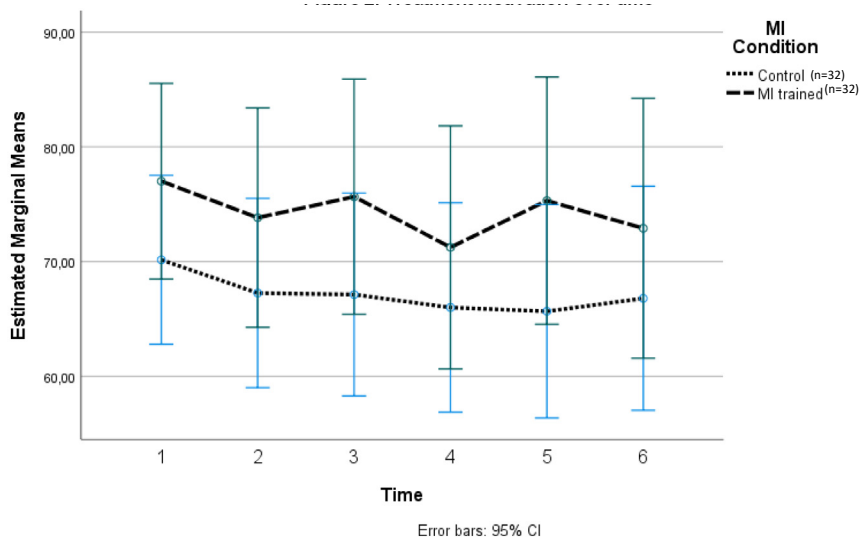
RESULTS

Motivation

Figures 3 and 4 show the development of Treatment Motivation and Reduction Motivation respectively. A mixed ANOVA showed no effect of time for either Treatment Motivation ($F_{5,330} = .61$, $p = .69$) or Reduction Motivation ($F_{5,330} = .50$, $p = .78$). Neither was there an effect of condition for either Treatment Motivation ($F_{1,66} = 1.68$, $p = .20$) or Reduction Motivation ($F_{1,66} = 1.50$, $p = .23$). Finally, the interaction of Time*Condition was not significant for either Treatment Motivation ($F_{5,330} = .15$, $p = .98$) or Reduction Motivation ($F_{5,330} = .37$, $p = .87$). Further analyses showed no meaningful interactions between MI condition and the CBM conditions with regard to changes in motivation.

Substance Use. The hypothesis regarding substance use was dependent on changes in motivation; however, results

FIGURE 3 Treatment Motivation Over Time



indicate that the MI protocol did not have a significant impact on participant motivation. The assumption that MI would improve the effects of the CBM intervention from the original trial[42] can therefore not be tested as was planned. Analyses on substance use reduction are therefore excluded.

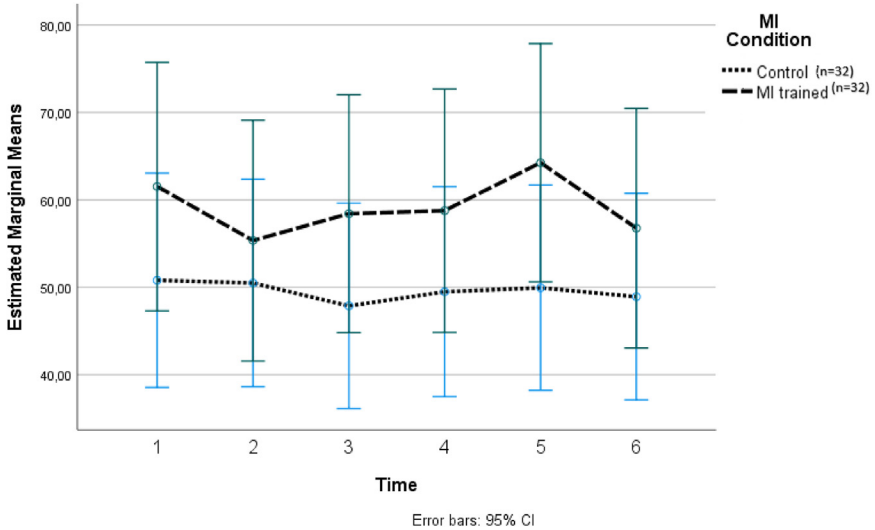
CBM Conditions. No main effects on Treatment Motivation were found. A significant effect on Reduction Motivation was found for the interaction of Time*MI*VPT*AAT ($F_{1,60} = 4.80$, $p = .03$). However, graphing this interaction showed no discernible pattern. The graph is presented in Supplement 1, available online.

DISCUSSION

This pilot study examined the feasibility and effectiveness of a brief MI protocol in enhancing motivation for treatment and substance use reduction in detained youth. Execution of the protocol was feasible, but no effects on motivation were found. This pilot study has identified several issues with the protocol that would require improvement.

First, the Stap-voor-Stap protocol asks the client to name their problem substance (this occurs right at the start of step 2). Everything that occurs in the program afterward (the graphing, pros and cons, etc) is in the context of that substance. However, the motivational measures (notably the Reduction Motivation item) assess motivation to reduce the

FIGURE 4 Reduction Motivation Over Time



substance for which the client is assigned to the CBM intervention. CBM assignation was based on reported use of alcohol and cannabis, but clients may have chosen a different substance (eg, tobacco) for the MI part of the study. The MI, as applied in this pilot study, may not always have been optimally aligned with their treatment.

Second, Stap-voor-Stap guides participants through the first stages of behavior change to arrive at preparation, that is, to initiate steps toward treatment. However, participants received the protocol while already in treatment, in terms of both the CBM intervention and their adjudicated treatment. This may have adversely affected the outcomes, although it is also the reality of adjudicated treatment that it often commences regardless of any intrinsic motivation.

Third, the original Stap-voor-Stap protocol was designed for adult parolees, who typically have a considerably longer history of substance use than the current sample, and thus have more opportunity for use behavior to tie in with antisocial behavior and for both behaviors to exacerbate each other. For the current sample, this relation might not yet have had time to develop. This would diminish one of the main driving factors of the MI protocol.

Finally, there is the format of the workbook that guides the Stap-voor-Stap process. There are several points in the protocol where participants have to read a block of text or a list of options. It is an unfortunate reality that a proportionally large number of detained youth function academically at a level well below average intelligence.[49] Larger text blocks may have been poorly understood or simply glossed over. Similarly, most workbooks were not engaged with outside of the MI sessions. The majority of participants declined to take them to their cells. Unlike with adult parolees, for whom therapy engagement can be a requirement, here it was entirely voluntary.

That said, one of the positive findings from this pilot study is that even though participation was voluntary and without compensation, 65% of eligible youth (ie, youth who used substances) chose to participate. Anecdotal feedback suggests that the youth did enjoy the Stap-voor-Stap format, and the workbook made engagement tangible. It is also worth noting that the indicated levels of motivation for engagement with the CBM treatment were higher than expected. This is at least suggestive of detained youth being reasonably well motivated to receive treatment, which is perhaps not optimally acted upon.

There are some study limitations. Potential psychiatric comorbidities were not taken into account during participant recruitment. It is possible that these may have influenced the results. However, the Very Intensive Care and the Forensic Observation groups were excluded from the recruitment phase, thereby eliminating youth with severe or chronic psychiatric disorders. As for the remaining participants, these represent the inherently heterogeneous demographic that can be found in a detention center, and are thus an ecologically valid representation of the youth who would receive treatment aimed at detained youth.

A further limitation is the low substance threshold use criteria. Youth were included as long as they had used substances, but were not selected based on diagnostic criteria of substance use disorders or dependencies. As stated, this low threshold was selected to ensure confidentiality. It is certainly possible that inclusion of a large number of participants with lower use levels has affected the results. Examining the standard errors of the Reduction Motivation scores (Table 1) shows that there was an enormous spread, with some clients being highly motivated and some not at all. However, as can also be seen, average CUDIT-R scores were around 13, which is typically used as a cut-off indicating potential cannabis use disorders,[45] suggesting that the sample contained more heavy and problematic users than casual ones. Moreover, post hoc linear regressions showed that baseline substance use scores did not predict reduction motivation. Subsequently, it seems more likely that a lack of development in motivation is due to a failure to convince the heavy users (for the reasons outlined above), rather than the influence of low use levels.

Finally, this study was limited by the fact that it was added onto an ongoing study. This limited the ability to include new instruments if the existing study already included instruments for those constructs. This is most notable in the Reduction Motivation item, which asked about reducing the substance targeted by the CBM study. Although this will have largely overlapped with the substance targeted by MI, this might not be true for all participants.

Future research should employ a better operationalization of motivation in its evaluation. Motivation is a nebulous concept,[1] and this may have an impact on adequate evaluation. Attempts to enhance motivation for substance use treatment would also benefit from focusing on detained youth with a longer history of substance use, or those who evince high (clinical) levels of use. Recent research suggests that motivational enhancement with recreational users might actually decrease motivation, while increasing it for heavy users.[33]

In summary, although this pilot study failed to show effects on motivation, it did show the feasibility of a short MI protocol and provided several avenues for improvement. The pilot study has also failed to show a significant decrease in motivation over time, despite the lack of compensation or, perhaps, appropriateness to reported substance use

levels. It suggests that the state of motivation in detained youth may not be as low as often portrayed in the literature. Motivation is present, and we have to keep improving our methodologies to effectively enhance it.

CRediT authorship contribution statement

Hans S. van der Baan: Writing – review & editing, Writing – original draft, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Annematt L. Collot D'Escury-Koenigs:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Raoul P.P.P. Grasman:** Writing – review & editing, Methodology. **Gerard M. Schippers:** Writing – review & editing. **Reinout W. Wiers:** Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization.

This article is part of a special series devoted to the subject of substance use, featuring topics relevant to child and adolescent behavioral health, including genetics, neuroscience, epidemiology, measurement, prevention, and treatment. This special series is edited by Guest Editor Kevin M. Gray, MD, *JAACAP Open* Deputy Editor Kara S. Bagot, MD, *JAACAP* Deputy Editor Mary Fristad, PhD, ABPP, *JAACAP* and *JAACAP Open* Associate Editor Robert R. Althoff, MD, PhD, *JAACAP Open* Editor Manpreet K. Singh, MD, MS, and Editor-in-Chief Douglas K. Novins, MD.

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The research was performed with permission from the UVA-FMG Ethics Committee.

Data Sharing: Deidentified participant data, Data dictionary, and Study Protocol and Informed Consent Form supporting documents available upon request from corresponding author. Data will be available with publication. As the data pertains to a particularly vulnerable participant group, data will not be made available to everyone. Applicants will be vetted and carefully considered. The data will be made available for scientific research. This will be determined on a case-by-case basis. There will be no additional restrictions on the use of the data or any additional information.

Dr. Grasman served as the statistical expert for this research.

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