



# Cognitive-Behavioral Therapy for Methamphetamine Dependence among Methadone-Maintained Patients

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## Abstract

**Background:** Cognitive-behavioral therapy has been suggested as a treatment program for methamphetamine dependence.

**Objectives:** The current brief report aimed to assess the effectiveness of 16 sessions of this treatment for abstinence from methamphetamine and improvement of psychological well-being among methadone-maintained patients.

**Methods:** Overall, 200 male and female methadone patients who were on stable methadone doses were assigned to either an intervention group (n=100) or a control group (n=100). The study was part of a randomized controlled trial conducted in five methadone services in Shiraz, near the Persian Gulf of Iran. All methamphetamine-dependent participants were assessed using two questionnaires at baseline, post-test (the end of the 16th cognitive-behavioral therapy or control session), and a three-month follow-up that was conducted 90 days after the end of the 16th session. Urinalyses were also conducted to detect methamphetamine use at the same assessment points. The control group was in a wait-list control condition. There was no participant attrition during the assessment procedures.

**Results:** Overall, 30 participants in the treatment group became abstinent at post-test and remained abstinent at follow-up. 16 sessions of cognitive-behavioral therapy led to a significant reduction in methamphetamine use ( $P < 0.001$ ) and improved psychological well-being ( $P < 0.001$ ) in the treatment group while there was no significant change in the control group.

**Conclusions:** Cognitive-behavioral therapy can be an efficacious option for methamphetamine problem in methadone treatment although further studies are suggested on long-term abstinence.

**Keywords:** Cognitive Therapy, Methamphetamine, Randomized Controlled Trial

## 1. Background

Methamphetamine dependence on stable methadone doses is a health concern in Iran that needs rehabilitation programs (1). However, there is no pharmacological treatment for this problem (2). Cognitive-behavioral therapy (CBT) is the main rehabilitation program for methamphetamine dependence (3). In the past 50 years, cognitive-behavioral therapies (CBTs) have become efficacious mainstream psychosocial interventions for many psychiatric problems (4). CBT has its own routes in behavior therapy (4). Behavior therapy approaches were developed during the 1950s when experimentally based principles of behaviors were utilized to modify maladaptive behaviors of humans (4, 5). During the 1970s, cognitive processes were also added as an important aspect of psychological distress (6). As a result, CBT techniques were devised and finally integrated with behavioral approaches to shape CBT for a num-

ber of psychiatric disorders such as drug dependence (6, 7).

CBT for drug dependence is based on the following principles: First, psychological dysfunction is defined in terms of mechanisms of information processing and learning. Second, the cognitive-behavioral approach to treatment is led by an experimental orientation to the behaviors of humans, in which any definite behavior is considered as a function of the specific environmental and internal conditions surrounding it (7). Behavior is therefore lawful and can be better realized and predicted once its function is shown (7).

The third is the premise that change is impacted by new learning experiences. The change, therefore, can occur in short-term because of learning these new thoughts and behaviors, and it is maintained over long-term as these newly obtained responses are generalized across situations and time. Fourth is the value of the scientific method

for CBT as reflected in the psychologist's ongoing evaluation of change in patients. Then, psychologists generate hypotheses about an individual's cognitive and behavioral patterns, intervene according to that hypothesis, observe the resulting behavior, and modify their hypothesis based on this consideration (6,7).

## 2. Objectives

The current study aimed to assess the effectiveness of 16 sessions of CBT for abstinence from methamphetamine and improvement of psychological well-being.

## 3. Materials and Methods

The study was a randomized controlled trial (RCT) conducted during 12 months of 2014. Overall, 200 male and female methadone patients who were on stable methadone doses were assigned to either an intervention group ( $n = 100$ ) or a control group ( $n = 100$ ). There were 300 patients with methamphetamine dependence in the study settings. Of them, 200 were needed to include in the study. Open-Epi software was used to calculate the required sample size.

The study was conducted in five methadone services in Shiraz, near the Persian Gulf of Iran. 100 participants were male and 100 participants were female. The participants were needed to be on stable methadone doses for at least three months. They were also needed to be in methadone maintenance treatment for at least six months. The psychiatric diagnosis of methamphetamine dependence was based on the Diagnostic and statistical manual of mental disorders, third revision, revised version criteria (8). The participants were excluded if they reported participation in any form of CBT for any disorder in the last 24 months.

All methamphetamine-dependent participants were assessed using two questionnaires at baseline, post-test (the end of the 16th CBT or control session), and a three-month follow-up that was conducted 90 days after the end of the 16th session. Urinalyses were also conducted to detect methamphetamine use at three times (i.e. the same assessment points). The control group was in a wait-list control condition. The questionnaires included the Persian versions of the methamphetamine items of the Opiate treatment index (OTI) (9) and the general health questionnaire-28 (GHQ-28) (10). The two questionnaires were assessed for reliability on 30 patients in two weeks. The reliability for the OTI was  $\alpha = 0.90$  and the reliability for the GHQ-28 was  $\alpha = 0.92$ . Data were analyzed using repeated measures ANOVA in SPSS version 18.

All participants were informed that participation in the study would be voluntary and confidential. Each

participant was asked to sign the study consent form. The trial was part of a study that was registered (IRCT 2015041121684N1). The study was approved by the ethics committee of Shiraz University of Medical Sciences (14578). All study procedures were conducted in the study settings. Two registered clinical psychologists conducted the CBT sessions. One research coordinator interviewed the participants at baseline and post-test to complete the questionnaires. Another research coordinator interviewed the participants to complete the questionnaires at follow-up. Urine specimens at baseline and post-test were taken by a registered nurse. Another nurse took urine specimens at follow-up. The research team had no connection to the study settings and participants.

## 4. Results

The demographics of the two groups are reported in [Table 1](#) indicating that the baseline equivalence was observed in the two groups.

Overall, 30 participants in the treatment group became abstinent from methamphetamine at post-treatment and remained abstinent at follow-up. Urinalyses also confirmed this issue. There was no participant attrition during the assessment procedures. This was because the participants were on stable methadone doses. Furthermore, the site managers were asked by the chief investigator to give the participants methadone on a daily basis during the study to prevent any attrition. The 16 sessions of CBT led to a significant reduction in methamphetamine dependence ( $P < 0.001$ ) and improved psychological well-being ( $P < 0.001$ ) in the treatment group while there was no significant change in the control group ([Table 2](#)).

## 5. Discussion

All participants were methamphetamine-dependent patients at baseline, which necessitated an effective rehabilitation program. However, no treatment program had been provided for them. The results of this brief report indicated that CBT led to abstinence from methamphetamine in a considerable number of patients in the intervention group. The results of the study indicated that CBT reduced methamphetamine dependence and improved psychological well-being in the treatment group while the control group had no considerable change.

The study indicated the participants in the intervention group were not dependent on methamphetamine after 16 weeks of treatment. This is consistent with two studies in Iran that indicated psychological treatment reduced

**Table 1.** Baseline Characteristics of the Patients (n = 200)<sup>a</sup>

| Groups                                       | Intervention Group (n = 100) | Control Group (n = 100) | Total (n = 200) | X <sup>2</sup> /t     | P Value |
|--|------------------------------|-------------------------|-----------------|-----------------------|---------|
| Age  | 34.2 ± 5.6                   | 33.1 ± 6.3              | 33.6 ± 5.9      | t = 0.25              | 0.13    |
| Education, y                                 | 8.5 ± 8.6                    | 7.2 ± 7.4               | 7.8 ± 8.0       | t = 0.62              | 0.12    |
| Living situation, stable                     | 66 (66.0)                    | 61 (61.0)               | 127 (63.5)      | X <sup>2</sup> = 0.91 | 0.27    |
| Marriage (married)                           | 52 (52.0)                    | 50 (50.0)               | 102 (51.0)      | X <sup>2</sup> = 0.45 | 0.26    |
| Duration of methamphetamine dependence       | 6.0 ± 9.5                    | 5.5 ± 8.4               | 5.75 ± 8.9      | t = 0.34              | 0.17    |
| Duration of being in methadone treatment, mo | 9.2 ± 9.6                    | 10.1 ± 8.4              | 9.6             | t = 0.35              | 0.15    |

<sup>a</sup>Values are expressed as mean ± SD or No. (%).

**Table 2.** Study Outcomes (n = 200)

| Groups                    | Measures | Study Stage | Mean Scores | F   | P Value  |
|---------------------------|----------|-------------|-------------|-----|----------|
| Treatment group (n = 100) | OTI      | Pre-test    | 1.22 ± 5.64 | 123 | 0.23     |
|                           |          | Post-test   | 0.13 ± 5.78 | 145 | < 0.001* |
|                           |          | Follow-up   | 0.12 ± 6.45 | 146 | < 0.001* |
|                           | GHQ-28   | Pre-test    | 6.00 ± 6.65 | 156 | 0.12     |
|                           |          | Post-test   | 3.95 ± 4.32 | 157 | < 0.001* |
|                           |          | Follow-up   | 4.00 ± 3.34 | 158 | < 0.001* |
| Control group (n = 100)   | OTI      | Pre-test    | 1.16 ± 6.78 | 122 | 0.23     |
|                           |          | Post-test   | 1.14 ± 8.76 | 127 | 0.56     |
|                           |          | Follow-up   | 1.00 ± 5.43 | 126 | 0.65     |
|                           | GHQ-28   | Pre-test    | 6.00 ± 5.47 | 157 | 0.12     |
|                           |          | Post-test   | 5.78 ± 8.65 | 153 | 0.54     |
|                           |          | Follow-up   | 5.50 ± 5.76 | 152 | 0.62     |

drug dependence and improved psychological well-being (11, 12). Further studies are needed on those aspects of CBT that can lead to abstinence in all participants. If such a treatment program can lead to abstinence from methamphetamine, it should be provided for methamphetamine dependence in methadone treatment services.

The study had several limitations that warrant discussion. First, the study was limited to several methadone clinics in a single city. Therefore, the study results may not generalizable to all methadone patients in Iran. Second, the study was limited to one follow-up because of lacked financial support. Further studies with more follow-ups are suggested.

### 5.1. Conclusions

The study is of importance because it is one of the first research of CBT for methamphetamine dependence as a treatment program in Iran, the most populous Persian Gulf country. Further studies with longer follow-ups are still needed to assess the effects of CBT on methamphetamine dependence in methadone clinics.

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### Footnotes

**Authors' Contribution:** Kiyanoosh Shakiba conceived and designed the study. Kiyanoosh Shakiba, Mohammad Effatpanah, and Afsaneh Moradi collected the data. Kiyanoosh Shakiba and Afsaneh Moradi performed the statistical analysis. Mohammad Effatpanah drafted the manuscript. Kiyanoosh Shakiba revised the paper critically. All the authors read and approved the final manuscript.

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