

Effectiveness of Metacognitive Therapy in Distress Tolerance and Drug Use Desire in Delinquent Teenagers

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ABSTRACT

Objective: This study aimed to determine the effectiveness of metacognitive therapy in improving distress tolerance and reducing the desire for drug use among delinquent teenagers in Shahriar.

Methods and Materials: Our research method was a quasi-experimental design with pre-test, post-test, a control group, and a follow-up phase. The statistical population of this study included all delinquent teenagers registered at the Shahriar Juvenile Correction and Training Center in 2022. The sample consisted of 30 male teenagers aged 16 to 18 years, selected through purposeful sampling. They were then divided into two groups of 15: an experimental group and a control group. The experimental group received 12 sessions of metacognitive therapy. Data were collected using the Metacognitive Therapy Scale and analyzed using repeated measures ANOVA in SPSS22.

Findings: The results of this study showed that there was a significant difference in distress tolerance and the desire for drug use in the treatment group in the post-test compared to the pre-test ($P < 0.01$). A significant difference was also observed in the follow-up compared to the pre-test ($P < 0.05$), but no significant difference was found in the follow-up compared to the post-test ($P > 0.05$).

Conclusion: The results indicate that metacognitive therapy can be beneficial in increasing distress tolerance and reducing the desire for drug use among delinquent teenagers. Metacognitive therapy has proven effective in improving distress tolerance and reducing the desire for drug use.

Keywords: *Metacognitive, Distress Tolerance, Desire for Drug Use, Delinquent Teenagers.*

1. Introduction

In recent years, there has been growing attention to the increased desire for drug use and the lack of distress tolerance among delinquent teenagers. In this regard,

contemporary psychological treatments such as metacognitive therapy, due to their focus on changing the way of thinking and the individual's relationship with their thoughts, have been examined. This approach, based on metacognitive theories and the individual's ability to

understand and control their cognitive processes, appears to be effective in reducing the desire for drug use and increasing distress tolerance in delinquent teenagers (Sheikholeslami et al., 2015).

Numerous studies have investigated the effectiveness of metacognitive therapies in various domains of mental disorders. Some of these studies have shown that this therapeutic approach can significantly reduce levels of anxiety, depression, and other psychological issues (Parviz & Sharifi, 2011; Pazani et al., 2016). However, fewer studies have focused on the effectiveness of these therapies among delinquent teenagers, particularly on distress tolerance and the desire for drug use.

On the other hand, some studies have examined the challenges and limitations of metacognitive therapy in this specific population. These studies emphasize the need to adapt therapeutic approaches to the unique needs of delinquent teenagers and highlight the importance of precise pre-treatment assessments to identify the individual and social issues of these teenagers (Pashmdoust & Ghaffari, 2015).

One of the most common and effective methods in managing emotional experiences (Babayi-Nadinloui et al., 2018) and reducing the temptation and desire for substance use is focusing on cognitive processes and attention to individuals' metacognitive beliefs (Garnefski et al., 2007; Mashhadi et al., 2011). Metacognition refers to the knowledge and beliefs about thinking and the strategies for regulating and controlling individuals' thought processes (Tajabadi & Moradi, 2016).

Therefore, metacognitive therapy, by emphasizing changing thinking patterns and paying attention to them, due to feelings of losing control over thoughts and behaviors and focusing thoughts on oneself and threatening topics, can be considered a beneficial method (Normann & Morina, 2018). This intervention, through changing attention to eliminate maladaptive thinking styles (as a barrier towards natural cognitive and emotional processing) and increasing flexibility in cognitive control, addresses these issues. Detached mindfulness, which leads to awareness of internal events without responding to them, is one of the main techniques of this therapy (Nordahl et al., 2018). This technique assists in moment-to-moment awareness and mindfulness of internal events (Esbjörn et al., 2018). Moreover, attention bias, which automatically occurs towards substance-related cues as temptation for substance use and seeking behavior, is mitigated through the technique of detached mindfulness by adjusting attention away from

these biased and automatic cues, thereby reducing the temptation for use (Hagen et al., 2017). Thus, it modifies metacognitive deficits that lead to the formation of tempting beliefs and beliefs related to substance use, decreasing maladaptive coping behaviors like substance use. In this context, the research findings of Babayi-Nadinlouei, Aminzadeh & Sattari (2018) indicated that metacognitive beliefs affect the improvement of adaptive cognitive emotion regulation strategies in substance-dependent women (Babayi-Nadinlouei et al., 2018). Nadery and Mohammadi (2017) also reported in their research findings that metacognitive therapy was effective on tempting beliefs and cognitive emotion regulation in relapse among addicts (Nadery & Mohammadi, 2017). On the other hand, due to the impact of craving and cognitive emotion regulation on reducing behaviors associated with substance abuse and confirming the effectiveness of each of the metacognitive therapy interventions (Nadery & Mohammadi, 2017; Pashmdoust & Ghaffari, 2015; Pirmia et al., 2016) and acceptance and commitment therapy (Forouzanfar, 2016; Kiani et al., 2012; Lanza et al., 2016; Witkiewitz & Bowen, 2010) in the field of treating problems associated with substance abuse in previous research, conducting the present study is of significant importance.

Another major concern regarding substance use disorder treatment is relapse into drug use after a period of abstinence. Many studies indicate that the relapse rate in these patients is very high. Only about 20 to 50 percent of these individuals can continue abstaining from substance use after one year (Amini et al., 2020). Stobaugh et al. (2019), believe that most individuals seeking treatment for substance use disorders, after receiving necessary treatment services and being discharged, experience a relapse into substance use (Stobaugh et al., 2019). Hershberger et al. (2018) mentioned that if there is no relapse after one month, the relapse rate significantly decreases to up to 98 percent (Hershberger et al., 2018). Segal et al. (2017) reported that only 21 percent of substance users are able to continue abstinence for less than ten years after quitting (Segal et al., 2017).

Furthermore, distress tolerance is one of the related constructs for research in the field of substance abuse (Simons & Gaher, 2005). Distress tolerance refers to how individuals respond to negative affect, which includes additional information beyond an individual's awareness of the level of negative emotions experienced. This affective response behavior is a useful capacity defined as an individual's ability to tolerate unpleasant internal states

(Zvolensky et al., 2010). In fact, distress tolerance is an individual difference variable that refers to the capacity to experience and withstand emotional distress (Basharpour & Abbasi, 2015). Research has shown that both the level of negative emotions experienced and different methods of responding to them are related to substance abuse problems, and also that a lack of distress tolerance plays a significant role in the development and persistence of substance abuse (Leyro et al., 2010). Distress tolerance is increasingly seen as an important construct in developing new insights about the onset and maintenance of mental health issues, as well as prevention and treatment (Kaiser et al., 2012). Research indicates that high levels of distress intolerance are associated with high levels of substance abuse, an increased risk of developing substance abuse disorders, and an increased risk of relapse (Sheikholslami et al., 2016).

Therefore, the aim of this article is to investigate the effectiveness of metacognitive therapy in distress tolerance and the desire for drug use in delinquent teenagers. This study strives to gain a deeper understanding of the potentials and limitations of this therapeutic approach through examining related experiences and integrating both consistent and inconsistent research findings. By precisely analyzing previous studies and presenting new empirical data. Additionally, the current study aims to provide a comprehensive overview of the current state of knowledge in this area and offer guidance for future research and practical applications.

2. Methods and Materials

2.1. Study Design and Participants

The research method of the present study was a quasi-experimental design with a pre-test, post-test, control group, and follow-up phase. The statistical population of this study included all delinquent teenagers registered at the Shahriar Juvenile Correction and Training Center in 2022. The sample consisted of 30 male teenagers aged 16 to 18 years, selected through purposeful sampling. They were then divided into two groups of 15: an experimental group and a control group. The experimental group received 12 sessions of metacognitive therapy.

Inclusion criteria were: substance abuse and voluntary referral to methadone maintenance treatment centers in Shahriar for detoxification; no severe cognitive or personality disorders; not concurrently participating in other psychological interventions; being aged between 16 to 18 years; having at least middle school education; informed

consent to participate in the therapy sessions. Exclusion criteria included: withdrawal of consent to continue participation in the sessions; occurrence of unforeseen events (hospitalization, death, etc.); absence from more than three therapy sessions; lack of physical or mental conditions suitable for completing the questionnaires or defects in completing the questionnaires in a way that negatively affects the outcome.

2.2. Measures

2.2.1. Substance Use Tendency

The Addiction Propensity Questionnaire, developed by Weed et al. (1992), consists of 38 questions evaluated with "Yes" or "No" options. This questionnaire includes questions where items 1, 5, 6, 11, 12, 18, 19, 23, 24, 28, 31, 32, 33, 34, and 36 are reverse scored, meaning choosing the correct option equals zero and choosing "No" equals one point. Questions 2, 3, 4, 7, 8, 9, 10, 13, 14, 15, 16, 17, 20, 21, 22, 25, 26, 27, 29, 30, 35, 37, and 38 are scored directly; choosing "Yes" equals one point, and choosing "No" equals zero. The final scale score is the sum of all scores obtained from the questionnaire. For women, a score above 23, and for men, a score above 24, indicates substance abuse propensity. Generally, based on research, the cut-off score for this scale is >21. In Walter's (1999) research, the test-retest reliability coefficient of the Addiction Propensity Questionnaire with a sample of 28 students over two weeks was 0.87. This test was standardized in Iran by Rostami et al. (2007), where the Cronbach's alpha obtained for this test was 0.29. The validity of this scale, measured by correlation coefficients, was 0.57, and the reliability coefficients of this scale in the standard sample (with a one-week interval) were 0.69 for men and 0.77 for women, respectively (Sheikholslami et al., 2016). The Cronbach's alpha obtained for the questionnaire in the present study was 0.39.

2.2.2. Distress Tolerance

The Distress Tolerance Questionnaire, created by Simons and Gaher in 2005, aims to assess the level of emotional distress tolerance from different dimensions (Tolerance, Absorption, Appraisal, Regulation). This scale has 15 questions and 4 subscales: Tolerance, Absorption, Appraisal, and Regulation. The phrases in this questionnaire are scored on a five-point scale (1- Strongly Agree, 2- Somewhat Agree, 3- Neither Agree nor Disagree, 4- Somewhat Disagree, 5- Strongly Disagree), with each option

respectively scoring 1, 2, 3, 4, and 5 points. Item 6 is reverse scored. Higher scores on this scale indicate higher distress tolerance. The overall distress tolerance score is obtained by summing all question scores, and scores for each dimension are obtained by summing the questions for each dimension. Simons and Gaher (2005) have reported structural validity and reliability of this scale using confirmatory factor analysis and reported its validity using correlation coefficients for each of the subscales between 0.64 and 0.82. They also reported the reliability of the questionnaire using Cronbach's alpha coefficients for the scales as 0.72, 0.82, and 0.70, and for the entire scale as 0.82, indicating good criterion and convergent validity. Alavi (2009), in her thesis, utilized this instrument and administered it to 48 students from Ferdowsi University and the Medical Sciences of Mashhad (31 women and 17 men), reporting that the overall scale validity was 0.68 and had high internal consistency reliability ($\alpha = 0.71$), with subscales having moderate reliability (Tolerance 0.54, Absorption 0.42, Appraisal 0.56, Regulation 0.58) (Basharpour & Abbasi, 2015).

2.3. Intervention

2.3.1. Metacognitive Therapy

The intervention protocol of this study, focusing on metacognitive therapy for delinquent teenagers with a tendency towards substance use, spans across ten sessions, each designed to address specific components and techniques within the metacognitive therapeutic approach. This structured intervention aims to enhance the participants' distress tolerance and reduce their inclination towards substance abuse by employing a variety of metacognitive strategies and mindfulness techniques (Nadery & Mohammadi, 2017; Setorg et al., 2013; Wells, 2000, 2009; Wells et al., 2008).

Session 1: Welcome and Introduction

The first session is dedicated to welcoming the participants, discussing the location, number of sessions, duration of the course, and length of each session. Group rules and regulations are established, members are introduced to each other, and an overview of the research tools is provided. Participants then complete the questionnaires.

Session 2: Introduction to Metacognitive Model

The content of the previous session is briefly summarized with the help of members. An explanation of the metacognitive model, detached mindfulness techniques, attention training, and postponing worry is provided, along

with a diagram presentation. Homework is assigned and feedback on its completion is emphasized.

Session 3: Beliefs and Mindfulness

This session discusses positive and negative metacognitive beliefs and practices related to them. Training on the detached mindfulness technique and an experiment on suppression-non-suppression, focusing on uncontrollability beliefs, are introduced.

Session 4: Feedback and Challenge Beliefs

Feedback from the previous session is gathered, and a review of the homework on positive and negative metacognitive beliefs is conducted. The session challenges these beliefs, introduces the technique of postponing worry, and teaches and practices metacognitive guidance.

Session 5: Review and Free Association

Feedback from the previous session is reviewed, and there's a discussion around homework. The session teaches and practices free association, presents homework, and collects feedback.

Session 6: Confrontation Techniques

Techniques for confrontation and preventing responses focused on reassurance beliefs, refocusing attention on safety cues, and teaching and practicing counterconditioning experiments are covered. Homework is assigned.

Session 7: Feedback and Mind Wandering

Feedback from the previous session is discussed, and homework is reviewed. The session teaches and practices the technique of prescribed mind wandering and the "Tiger Task" exercise, assigns homework, and gathers feedback.

Session 8: Threat Monitoring and Attribution

This session focuses on teaching techniques to change threat monitoring focused on self-conscious beliefs and uses verbal and behavioral reattribution techniques centered on risk beliefs.

Session 9: Verbal Loop and Rebel Child

Feedback from the previous session is reviewed, and homework is discussed. The session teaches and practices the verbal loop technique and the "Rebel Child" exercise, assigns homework, gathers feedback, and answers questions raised by members.

Session 10: Evidence Review and Conclusion

Techniques for examining contrary evidence are taught, preparing members to identify obstacles in applying techniques and concluding the intervention.

2.4. Data analysis

Data were analyzed using repeated measures ANOVA in SPSS22 software.

The mean and standard deviation of the age of participants were 16.73 (SD = 0.799) for the experimental group and 17.00 (SD = 0.926) for the control group. An independent t-test showed that the groups were homogeneous in terms of age and there was no significant difference between them ($p > 0.05$, $t = 0.845$).

3. Findings and Results

Table 1

Mean and Standard Deviation of Distress Tolerance and Desire for Drug Use at Pre-test, Post-test, and Follow-up

Variable	Group	Pre-test M (SD)	Post-test M (SD)	Follow-up M (SD)
Distress Tolerance	Test	33.67 (9.332)	45.13 (8.149)	43.87 (8.459)
	Control	34.07 (8.198)	32.93 (9.223)	32.33 (8.575)
Desire for Drug Use	Test	30.33 (4.791)	23.47 (5.343)	20.00 (6.059)
	Control	32.27 (3.058)	31.07 (2.939)	31.80 (3.877)

The results in Table 1 indicated differences between the pre-test, post-test, and follow-up stages in the research variables after the intervention was applied to the experimental group compared to the control group. Prior to conducting the repeated measures ANOVA, assumptions were checked. The Shapiro-Wilk test confirmed the normal distribution of scores for distress tolerance and desire for drug use variables, with p-values significantly higher than the conventional threshold of 0.05. Moreover, Levene's test

for equality of error variances yielded non-significant results for distress tolerance ($p = 0.615$, $F = 0.259$) and desire for drug use ($p = 0.057$, $F = 3.943$), indicating equal variances of residuals among groups. The results suggested that the sphericity assumption for the research variables was not met ($p > 0.05$), necessitating the use of Greenhouse-Geisser correction for estimating differences. Mixed ANOVA results are reported in Table 2.

Table 2

Results of the Analysis of Variance for Within-group and Between-group Differences

Variable	Source of Variation	Sum of Squares	df	Mean Square	F	Significance Level	Eta Squared
Distress Tolerance	Time	454.867	1.375	330.83	11.071	.001	.283
	Time × Group	754.022	1.375	548.409	18.352	.001	.396
	Group	1361.111	1	1361.111	7.384	.011	.209
Desire for Drug Use	Time	472.956	1.628	290.529	19.306	.001	.408
	Time × Group	367.756	1.628	225.906	15.011	.001	.349
	Group	1137.778	1	1137.778	31.499	.001	.529

The results in Table 2 showed that the F value for the group factor was significant for both distress tolerance and the desire for drug use ($p < 0.01$), indicating that metacognitive therapy was effective in improving distress

tolerance and reducing the desire for drug use. The significance of the group*time interaction was examined using Bonferroni post hoc tests (Table 3).

Table 3

Bonferroni Post-hoc Test

Variable	Pairwise Comparison	Mean Difference	Standard Error	Significance Level
Distress Tolerance	Pre-test – Post-test	-5.167*	1.309	.001
	Pre-test – Follow-up	-4.233*	1.393	.015
	Post-test – Follow-up	0.933	0.675	.533
Desire for Drug Use	Pre-test – Post-test	4.033*	0.773	.001
	Pre-test – Follow-up	5.400*	1.098	.001

Post-test – Follow-up

1.367

0.804

.300

Changes in the experimental group over time, as shown in Table 3, indicated that there was a significant difference in distress tolerance and the desire for drug use in the treatment group in the post-test compared to the pre-test ($p < 0.01$). A significant difference was also observed in the follow-up compared to the pre-test ($p < 0.05$). However, no significant difference was found in the follow-up compared to the post-test ($p > 0.05$).

4. Discussion and Conclusion

This study examined the effectiveness of metacognitive therapy in increasing distress tolerance and reducing the desire for drug use among delinquent teenagers. The results demonstrated that metacognitive therapeutic methods could significantly impact improving the psychological and behavioral state of this group of teenagers, including increased distress tolerance and reduced desire for drug use. Moreover, metacognitive therapy could significantly enhance the psychological and social functioning levels of these teenagers.

According to metacognitive theory, cognitive and emotional regulation disorder stems from flawed metacognitions about patients' internal experiences, such as intrusive thoughts and worry, and unhelpful metacognitive beliefs about the implications of these experiences and the non-utilization of correct emotions and cognitions. In many cases, patients are not aware of these metacognitive beliefs. Metacognitive therapy helps patients become aware of their internal experiences and then examine and evaluate beliefs and unhelpful strategies. Metacognitive therapy employs various techniques such as verbal challenge, behavioral experiments, detached mindfulness, and exposure and prevention of response to help patients identify distress-inducing intrusive thoughts, emotions, and interpretations, and to correct unhelpful metacognitive beliefs. Cognitive and emotional disorders in addicts result from metacognitive processes leading to specific thinking styles, trapping the individual in prolonged and recurring negative information processing states about themselves; in other words, in psychological disorders, the patient feels they have lost control. Patients' strategies often include attempts to regain control over the nature of thinking. One such strategy is attempting to predict future events, i.e., engaging in worrying processes (Hagen et al., 2017; Nadery & Mohammadi, 2017). In other words, individuals with psychological disorders exhibit a repetitive and ruminative

thought pattern focused on self-related topics. This condition is known as the cognitive-attentional syndrome, which involves excessive conceptual processing in the form of worry and rumination, reducing their distress tolerance. Worrying focuses the individual's attention on negative information, leading to a distorted perception of self and the world, likely leading individuals back to substance use if this flawed cycle is not stopped. Although worrying focuses on potential future risks, it has little relation to the actual likelihood of dangerous events occurring (Esbjörn et al., 2018; Nordahl et al., 2018). Distress can divert attention from processing intrusive images, thereby inhibiting emotional processing. In explaining the results of this study's findings, it can be stated that metacognitive treatment in the experimental group led to an increase in distress tolerance scores. Scores significantly increased over the eight training sessions compared to the pre-test, while the distress tolerance scores of the control group did not change significantly.

Additionally, the results of this study are consistent with the prior research (Esbjörn et al., 2018; Kaiser et al., 2012; Nadery & Mohammadi, 2017; Nordahl et al., 2018; Pirnia et al., 2016), in a case report, studied metacognitive-focused occupational therapy for substance abuse and found that metacognitive treatment had a significant effect on modifying tempting beliefs and beliefs related to substances. Moreover, the effectiveness of this treatment was stable in two-month, six-month, and one-year follow-ups. Spada and Wells (2009) state that beliefs about the need to control thoughts (negative metacognitive beliefs) directly predict substance use, assuming that beliefs about the uncontrollability of thoughts can reflect the tendency towards intrusive thoughts related to temptation and craving for substance use. The firm belief that the experience of craving must be controlled leads to the selection of unsuccessful strategies such as thought suppression and substance use. When these strategies lead to continued use, they reinforce negative metacognitive beliefs about controlling craving, such as "I can't control my craving" or exacerbate catastrophic beliefs like "I will never be able to control my temptation." Also, considering recent research on the relationship between attention bias and craving for substance use, it seems that metacognitive therapy techniques have been effective in correcting executive processes such as attention and removing attention from biased and automatic states in reducing tempting beliefs and

judgments (Spada & Wells, 2009). According to Wells (2009), techniques like detached mindfulness counteract and moderate the cognitive-attentional syndrome. This syndrome, due to focusing on threat evaluation, failure to provide corrective information for evaluations and wrong beliefs, blocking a way to find attentional resources for adaptive responses, creating bias in lower-level automatic cognitive processes, and resulting in problematic interpersonal environmental outcomes, has been considered a problem in achieving psychological peace (Wells, 2009). Improved attention control by these techniques allows the individual to correct their inefficient knowledge and process potential threat stimuli in craving without creating inefficient cognitive formations or biased cognitive processes. Metacognitive therapy increases access to disconfirmatory processing and conditions for creating better metacognitive plans for controlling executive processes, resulting in reduced craving in addicts (Wells, 2000).

In explaining the effectiveness of metacognitive therapy on craving in patients with substance use disorder, it can be stated that drugs have the capacity to monopolize all the attention, resources, and energy of the individual and exclusively focus the individual's attention on obtaining the next dose at any cost. In metacognitive theories, relapse into substance use is dependent on attention biases, judgments, and evaluations regarding substance-related stimuli. These cognitive biases are themselves dependent on individual differences in temptation and mental craving. In metacognitive therapy, using attention training exercises and objective awareness of thoughts and internal events without any active cognitive response (confirmatory evaluation, conceptual processing and analysis, effort to control or suppress), self-focus is reduced, leading to increased attention flexibility and preventing attention bias in facing situations. Consequently, attention bias, which automatically occurs towards substance-related cues as temptation for substance use and seeking behavior, is mitigated through the technique of detached mindfulness by adjusting attention away from these biased and automatic cues, thereby reducing the temptation for use.

Based on the findings of this study, the importance and efficacy of metacognitive therapy in reducing distress tolerance and the desire for drug use among delinquent teenagers can be highlighted. This study shows that individuals who underwent metacognitive therapy reported a lower level of distress tolerance and desire for drug use

after the intervention compared to those who did not receive metacognitive therapy.

As an effective therapeutic approach, metacognitive therapy can play a significant role in improving the psychological and behavioral status of delinquent teenagers. This method can aid their distress tolerance and reduce their desire for drug use. However, further research and investigation of other influencing factors in this process are needed to utilize the best therapeutic approaches in this field. This study's limitations and research suggestions faced by the researcher include:

5. Limitations & Suggestions

This study may have used a small sample of delinquent teenagers, which could complicate generalizing the results to the entire population under study. Time and financial limitations may also restrict further research, the use of larger samples, or the application of more complex research methods. Therefore, to strengthen the generalizability of the results, it is recommended to expand the sample size using larger and more diverse samples. Comparative studies can also be conducted to compare the efficacy of metacognitive therapy with other treatment methods. Finally, to increase the efficiency and effectiveness of the treatment, multiple and combined interventions can be utilized.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

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