




Examining the Efficacy of Matrix Therapy in Resilience and Relapse among Amphetamine Dependents (Crystal)

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Article Info

Article type:

Original Research

How to cite this article:

Farhad, H., Abolghasemi, S., & Hamzehpoor Haghighi, T. (2024). Examining the Efficacy of Matrix Therapy in Resilience and Relapse among Amphetamine Dependents (Crystal). *Journal of Adolescent and Youth Psychological Studies*, 5(1), 111-116.
<http://doi.org/10.61838/kman.jayps.5.1.13>



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ABSTRACT

Objective: This study aimed to examine the efficacy of Matrix therapy in enhancing resilience and reducing relapse in individuals with Amphetamines abuse.

Methods and Materials: The research methodology was quasi-experimental, with a pre-test, post-test design, including an experimental and a control group. The study population consisted of male amphetamine dependents self-reporting to addiction rehabilitation centers in Tehran in the year 2021. A sample of 40 individuals was selected through convenience sampling, accounting for participant dropout, and randomly divided into two groups of 20 for the control and experimental conditions. Data collection tools were Substance Abuse Relapse Scale by Ogai et al. (2007) and Connor-Davidson Resilience Scale (2003). The study utilized ANCOVA to analyze the collected data.

Findings: The results indicated a significant difference between the Matrix therapy and control groups. Matrix therapy contributed to increased resilience and a reduction in relapse rates, also decreasing the frequency of substance use relapse.

Conclusion: Based on the findings of this research, it can be concluded that Matrix therapy could be considered as an adjunct to pharmacological treatments in individuals dependent on amphetamines.

Keywords: Matrix, Resilience, Relapse

1. Introduction

Substance abuse is one of the most serious human dilemmas in recent years and one of the most complex human phenomena, leading to recurrent occupational, social, and legal problems as a pattern of non-conforming substance use (Allahverdipour et al., 2009).

Currently, at least 1,300 types of stimulants exist, among which amphetamine compounds and coca products are the most widely used globally, with substances like Ecstasy 3,4-Methylenedioxymethamphetamine (MDMA) being prominent examples (Sadock et al., 2000). The high prevalence of amphetamine and methamphetamine use and the extraordinarily high rates of mortality among its users in

recent years have been a focus of many studies (Ehteshami et al., 2018). From 2006 to 2015, there was an approximately 23% increase in the number of drug users worldwide, with the estimated global prevalence rate rising from 4.9% in 2006 to 5.29% in 2015. In Iran, the mortality rate due to the use of stimulants and narcotics increased by 8.6% from 2015 to 2016, with over 3,190 addicts dying due to misuse. Among all narcotics, methamphetamine, in addition to its direct effects on the user, involves secondary social costs such as disruption in family, school, work life, and the occurrence of various forms of violence and delusions (Ehteshami et al., 2018; Oji et al., 2020). Over the past two decades, efforts have been made to develop successful models and effective treatment protocols for stimulants, with findings indicating that pharmacological treatment alone is not sustainable in preventing relapse and that the majority of addiction treatment relies on psychological therapies. One such program, which has achieved relative success and has been approved by the United States Department of Health and Human Services, is known as the Matrix program (Ehteshami et al., 2018). The Matrix treatment program has, in some cases, begun to be adopted as a standard protocol in stimulant treatment centers (Ehteshami et al., 2018). Research has shown that addiction treatment solely with medication is not enduring, and given the range of psychological and physical engagements, the diversity of therapeutic actions and the use of various medical and psychological interventions seem necessary (Oji et al., 2020). New approaches to addiction prevention have emphasized the identification and enhancement of protective factors such as resilience and the identification and reduction of risk factors. Individual resilience facilitates effective adaptation to risk factors, and research has shown that some resilient individuals, after facing difficult life situations, return to their normal level of functioning and even improve in some cases. By increasing resilience against substance misuse, one can effectively prevent addiction tendencies, reduce the cost and burden of this damage, and create an environment conducive to sustainable development. Therefore, the more individuals understand the process of resilience, the more targeted and effective prevention programs can be in enhancing the quality of life and hope for recovery in individuals (Allahverdipour et al., 2009; Ehteshami et al., 2018).

Studies on the Matrix method have been conducted in areas such as relapse prevention. In a pilot study comparing the Matrix method with hospital treatment programs among cocaine users, the results demonstrated the effectiveness of

the Matrix method. Research has shown that this method is effective in treating the psychological symptoms of users of various psychostimulants and alcohol (Isanejad & Haydarian, 2022; Oji et al., 2020; Ruisoto & Contador, 2019).

The primary interventions in Matrix treatment focus on increasing patient and family awareness about addiction and related behaviors, how they develop, and how to treat them; relapse prevention skills and managing potential slip-ups; life skills such as planning and communication; addressing psychological and spiritual issues and reducing stress associated with addiction; and managing physical health disorders (Allahverdipour et al., 2009). Given the effectiveness of non-pharmacological interventions, the absence of side effects, and their cost-effectiveness, these types of interventions have increasingly gained attention. Therefore, considering the importance of treating amphetamine addiction, the impact of resilience and relapse variables, and the effectiveness of interventionist approaches, the researcher seeks to answer whether the Matrix treatment plays a role in resilience and relapse prevention.

2. Methods and Materials

2.1. Study Design and Participants

The present study employed a quasi-experimental design with experimental and control groups. The study population consisted of male amphetamine dependents self-referred to addiction rehabilitation centers in Tehran in the year 2021. Considering participant dropout, a sample of 40 individuals from the population was selected using convenience sampling and divided randomly into two groups of 20 for the control and experimental conditions. The research utilized pre-test and post-test assessments using the Craving Questionnaire and Beck's Depression Inventory. The convenience sampling was conducted at the Aryapak Tolou Camp.

2.2. Measures

2.2.1. Resilience

The Connor-Davidson Resilience Scale (CD-RISC) is a widely used psychological assessment tool designed to measure resilience, which is the ability to cope with and bounce back from adversity. Developed by Kathryn M. Connor and Jonathan R.T. Davidson in 2003, this scale is based on the concept that resilience can be strengthened and

quantified. The CD-RISC comprises 25 items, each rated on a 5-point Likert scale ranging from 0 (not true at all) to 4 (true nearly all the time). The items are designed to assess various aspects of resilience, including personal competence, tolerance of negative affect, positive acceptance of change, control, and spiritual influences. The total score, which can range from 0 to 100, reflects the respondent's level of resilience; higher scores indicate greater resilience. The scale has been validated in various populations and has shown good psychometric properties, including high internal consistency and test-retest reliability. It's used in diverse settings, from clinical psychology to research studies, and has been adapted into several languages (AghaDavoud Marnani et al., 2022; Cai et al., 2017; Singh & Yu, 2010).

2.2.2. Substance Abuse Relapse

In this study, substance abuse relapse is measured using the Relapse Questionnaire developed by Ogai and colleagues (2007). This questionnaire includes sub-scales for anxiety and intention to use (8 items), emotional problems (8 items), compulsion to use (4 items), positive expectations and lack of control over usage (6 items), and lack of negative expectations from the substance (4 items). Therefore, the scale comprises 30 items and is scored on a 7-point Likert scale (Ogai et al., 2007). The reliability and validity of this questionnaire have been confirmed in various studies (Ehteshami et al., 2018; Ruisoto & Contador, 2019).

2.3. Intervention

2.3.1. Matrix Program

The implementation of the Matrix program consisted of two to three sessions weekly, conducted with the presence of a therapist and the patient. The program spanned 22-24 sessions, constituting a localized, scheduled three-month program with a well-defined plan for each session. The participation of at least one family member in one session per week was mandatory. Each session lasted half to one hour, covering topics specific to that session, reviewing the

previous session's tasks, and setting tasks for the upcoming week, including reviewing the patient's behavioral status over the week. The Matrix treatment approach focused on interventions such as familiarizing the patient and their family with addiction, stimulants, and their treatment; identifying problematic situations for each patient; skills to prevent cravings and manage them; skills for managing potential relapses and staying clean; enhancing the ability to deal with stress and adversities; and life skills for a healthy, substance-free life like planning, communication, healthy recreation, etc. Urine tests were used for monitoring potential relapse.

2.4. Data analysis

For data analysis, the Analysis of Covariance (ANCOVA) method was used, ensuring homogeneity of variances within groups and applying Levene's and Shapiro Wilk's tests to check for the normal distribution of data. The data were then analyzed using SPSS software.

3. Findings and Results

Most participants in both the experimental and control groups were aged between 31 and 40 years (80% and 65%, respectively). In the experimental group, 20% had a high school diploma, 40% had an associate degree; in the control group, 50% had below high school education, 25% had a high school diploma, and 25% had an associate degree. The average resilience scores of the experimental group participants increased from 37.00 in the pre-test to 75.30 in the post-test, an increase of 38.3 points; the addiction relapse scores decreased from 147.35 in the pre-test to 88.05 in the post-test. In the control group, the average resilience scores changed from 38.55 in the pre-test to 38.22 in the post-test; the average addiction relapse scores changed from 144.33 in the pre-test to 144.81 in the post-test. A comparison of the participant scores before and after the intervention indicates a significant decrease in the dependent variable scores in the experimental group, while the control group showed negligible differences.

Table 1

Results of Univariate Analysis of Covariance on Resilience

Variable	SS	Df	MS	F	p	Effect Size
Group - Post-test	11435.32	1	11435.32	80.58	0.001	0.703
Error	4824.96	34	141.91	-	-	-
Total Corrected	18727.77	39	-	-	-	-

The resulting F-value from the covariance analysis indicates that after controlling for the effects of the covariate (pre-test), there was a statistically significant difference between the adjusted post-test resilience scores of the experimental and control groups ($P < 0.001$; $F =$

$80.58(1,34)$). This implies that the Matrix treatment significantly affected the increase in resilience in amphetamine dependents. The partial eta squared shows that 70.3% of the changes (increase) in resilience were due to the Matrix intervention.

Table 2

Results of Univariate Analysis of Covariance on Relapse

Source	SS	Df	MS	F	p	Effect Size
Group - Post-test	29780.62	1	29780.62	383.03	0.001	0.918
Error	2643.55	34	77.75	-	-	-
Total Corrected	43485.10	39	-	-	-	-

Similarly, the F-value from the covariance analysis indicates that after controlling for the pre-test effects, there was a statistically significant difference between the adjusted post-test relapse scores of the experimental and control groups ($P < 0.01$; $F = 383.03(1,34)$). This suggests that the Matrix treatment significantly reduced relapse in amphetamine dependents. The partial eta squared shows that 91.8% of the changes (decrease) in relapse were due to the Matrix intervention.

4. Discussion and Conclusion

The findings of the present study add significant insight into the efficacy of the Matrix Model in treating amphetamine dependence, emphasizing its role in enhancing resilience and reducing relapse. These results align with previous research highlighting the need for comprehensive treatment approaches in addressing substance abuse and dependence issues (Allahverdipour et al., 2009; Ehteshami et al., 2018).

The observed increase in resilience and decrease in relapse rates among participants in the Matrix treatment group corroborate the findings of Oji et al. (2020), demonstrating the importance of resilience in the treatment of substance abuse (Oji et al., 2020). This is consistent with the broader literature on the protective role of resilience in mental health and addiction recovery (Isanejad & Haydarian, 2022).

Moreover, the study's emphasis on family involvement in the Matrix program resonates with the systemic approach in substance abuse treatment, acknowledging the significant role of the social environment in recovery processes (Miller & Moyers, 2017). This approach is in line with Halkitis, Parsons, and Wilton's (2003) findings on the contextual

factors influencing methamphetamine use among specific populations (Halkitis et al., 2003).

The study also sheds light on the need for addressing psychological components in addiction therapy. As suggested by Rosenberg (2009) and Ruisoto and Contador (2019), psychological factors like stress and craving play a crucial role in addiction and relapse (Rosenberg, 2009; Ruisoto & Contador, 2019), underscoring the importance of psychological interventions in treatment programs.

Furthermore, the effectiveness of the Matrix Model in this study supports the notion that non-pharmacological interventions, especially those focusing on cognitive-behavioral strategies and psychoeducation, can be potent tools in treating substance dependence (Keng et al., 2011; Leung et al., 2010). This aligns with the third edition of "Alcohol: No Ordinary Commodity" by Babor et al. (2022), which emphasizes the need for comprehensive approaches in tackling substance abuse (Babor et al., 2022).

Additionally, mindfulness and other contemporary psychological interventions have been increasingly recognized as beneficial in managing addictive behaviors (Spinella et al., 2013). The findings of this study support this view, suggesting that incorporating mindfulness-based techniques into programs like the Matrix Model could further enhance their effectiveness.

In conclusion, this study contributes to the growing body of literature supporting the efficacy of comprehensive, non-pharmacological interventions like the Matrix Model in treating substance dependence. Its focus on resilience and family involvement, coupled with the potential integration of mindfulness and stress management strategies, offers a holistic approach to addressing the complex nature of substance abuse and dependence.

5. Limitations & Suggestions

The study's findings are limited by its focus on a specific demographic (male amphetamine dependents in Tehran), suggesting the need for further research to understand the model's effectiveness across different populations and settings. Moreover, longitudinal studies are needed to assess the long-term impact of the Matrix Model on resilience and relapse rates.

To enhance the treatment of amphetamine dependence and other substance use disorders, it is recommended to integrate the Matrix Model into existing treatment protocols, given its proven effectiveness in boosting resilience and reducing relapse. Involving family members in the treatment process is crucial, as it provides additional support and understanding. Emphasizing resilience training, incorporating mindfulness and stress reduction techniques, and ensuring regular patient monitoring are key strategies. Tailoring psychological interventions to individual needs, including cognitive-behavioral therapy and motivational interviewing, and providing specialized training for healthcare providers in these approaches are essential. Additionally, public awareness campaigns on the risks associated with amphetamine use and the benefits of comprehensive treatment approaches, along with ongoing research and community collaborations, are vital for improving treatment outcomes and reducing the stigma associated with addiction.

Acknowledgments

We would like to express our appreciation and gratitude to all those who cooperated in carrying out this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics 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.

Funding

None.

Authors' Contributions

Homayoun Farhad contributed to the conceptualization of the research, data collection, and the drafting and revision of the manuscript. Shahnam Abolghasemi contributed to the study's design, statistical analysis, and interpretation of the results. Tahereh Hamzehpoor Haghghi played a significant role in data collection, participant recruitment, and contributed to the literature review. All authors reviewed and approved the final manuscript for publication.

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