

## Abstract

**Objective:** This study was an attempt to compare the therapeutic effects of matrix treatment on the severity of addiction and mental health between female and male methamphetamine abusers.

**Method:** From among 121 patients admitted in maintenance treatment centers, 91 patients who met the conditions required for participation in this study were selected and randomly assigned to two separate groups based on gender (female=43 and male=48). In the following, 9 males and 4 females were excluded from the study. General health questionnaire and Addiction Severity Index were administered to both groups before and after the intervention.

**Results:** The results were indicative of no significant difference in any of the subscales of addiction severity between female and male abusers after treatment. However, the difference in mental health scores was statistically significant. Males experienced an increase in depression in comparison with females whereas females underwent higher levels of anxiety than males.

**Conclusion:** Matrix treatment shows significantly different effects on mental health of females and males.

**Keywords:** Mental Health, Addiction Severity, Substance Abuse, Matrix Model

# On the Comparison of the Therapeutic Effects of Matrix Treatment on Severity of Addiction and Mental Health between Female and Male Methamphetamine Abusers

Rohoullah Haddadi, Nafiseh Motlaq, Ghasem Keshavarz Gerami, Zeinab Kamali, Shahnaz Mohammadi, Sepideh Bakht

**Rohoullah Haddadi**

M.A. in Clinical Psychology  
Tehran University, Iran  
E-mail: r\_hadadi2000@yahoo.com

**Nafiseh Motlagh**

Bachelor of Clinical Psychology  
Kharazmi University, Iran

**Ghasem Keshavarz Gerami**

M.A. in Assessment, Evaluation, Measurement, Psychometrics, and Statistics  
Allameh Tabataba'i University, Iran

**Zeinab Kamali**

M.A. in General Psychology  
Tehran University, Iran

**Shahnaz Mohammadi**

Assistant Professor  
Kharazmi University, Iran

**Sepideh Bakht**

M.A. in General Psychology  
Allameh Tabataba'i University, Iran



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## Introduction

The issue of substance abuse and dependence on synthetic drugs, particularly methamphetamine has become such a serious and controversial problem in recent years that has led many officials at all levels of decision-making to devise a solution for it. According to the latest statistics and rapid analysis of the situation in 2007, methamphetamine users constitute about 4% of the drug abusers. As well, the results of the study conducted on the use of stimulants in Tehran implicated the increasing growth of the use of these substances, particularly methamphetamine (Emami Razavi, cited in Taheri Nakhost, Jafari, & Gilanipour, 2012). This substance is so highly addictive that the continuity of its consumption and harmful effects leads to a wide range of behavioral, psychological, social, and physiological dysfunctions (Pates & Riley, 2010). Thus, the treatment of these patients has always been of great importance (Curran, Byrappa & McBride, 2004). In this regard, many therapists and researchers have attempted to develop a therapeutic model (Rawson et al., 2004). As a consequence, considerable attention was paid to the development and evaluation of behavioral/psychosocial treatment methods. One of the promising therapeutic approaches in recent years has been matrix model. Studies have shown that a large number of patients continue this method of treatment, despite the long period of treatment and, thereby, negative tests of methamphetamine during this period are more frequently observed (Rawson et al., 2004). However, despite the effectiveness of the above-mentioned intervention in the treatment of these patients, this group of patients is again considered as the high-risk group with the high probability of treatment failure; therefore, this issue has remained a major challenge for clinical therapists (Makri, 2011). In this regard, several factors are considered as obstacles to the recovery of the patients. One of these factors is the ignorance of gender-related differences in the development of treatment plans (Grella & Joshi, 1999; cited in Hser, Evans & Huang, 2005; Hser, Huang, Teruya & Anglin, 2004).

The majority of people conceive of addiction and drug abuse as a masculine phenomenon whereas drug addiction in women assumes considerable importance compared with men according to various reasons. There are some differences in the severity of addiction between men and women; however, scientific evidence shows that drug abuse and addiction have given rise to different challenges for both genders and have different manifestations in two genders (Rahimi Movaghar, Malayeri Khah, Langroudi, Delbarpour Ahmadi & Amin Ismaili, 2007). Gender differences are also involved in health needs of consumers (Grella & Joshi, 1999; cited in Hser et al., 2005; Hser et al., 2004). These differences can be seen in the way drug use is expanded among men and women, in substance choice, treatment seeking, and the type of response to treatment (Opland, Winters & Stinchfield, 1995). It is reasonable to expect that therapists recognize these differences before the development of the treatment

plans and practice of their treatment model and set their objective in line with such differences. Most of the studies in this area have reached the conclusion that the women under treatment have more psychological symptoms such as high anxiety and depression, low self-esteem, and high rates of childhood sexual abuse in comparison with men. On the other hand, men are more likely than women to engage in criminal acts, and get imprisoned or prosecuted (Anglin, Hser & Booth, 1987; Anglin, Hser & McGlothlin, 1987; cited in Hser et al., 2005).

Research about the impact of gender differences on post-treatment outcomes is limited; some studies do not show any differences in this area (such as Alterman, Randall & McLellan, 2000; Gerstein & Johnson, 2000), while other studies have obtained positive results on one gender (such as Grella, Joshi & Hser, 2003). Due to the fact that the needs and problems of women and men in the treatment of addiction differ, this study is focused on exploring the consequent therapeutic effects of matrix model on the severity of addiction and mental health of methamphetamine abusers. Undoubtedly, attention to such differences is considered as an important factor in the development of treatment plans and their consequences.

## **Method**

In the present study, a quasi-experimental design along with pre-test and post-test was employed. The methamphetamine (crystal) abusers receiving maintenance treatment services in 4 rehabilitation centers located in the municipal area 8 of Tehran constituted the population of the study. The researcher(s) prepared a list of the abusers who received medical services at these centers to select participants. This list included 121 individuals. Thereafter, the researcher(s) conducted the semi-structured interview entitled "Addiction Severity Index" on each of them with the help of his colleagues in order to determine the inclusion criteria of the study. These criteria were set as follows: diagnosis of substance abuse according to the criteria of Diagnostic and Statistical Manual of Mental Disorders (fifth edition), the predominant use of methamphetamine (crystal) for at least 6 months, no history of any serious psychiatric illness, numerous previous unsuccessful treatment attempts, obtaining written consent, and willingness to participate in the research. After the interviews, 91 individuals were finally selected for the project. They were divided into two groups in terms of gender. The first group consisted of the female crystal users treated with matrix model (n=43) and the second was comprised of male crystal users treated with matrix model (n=48). After the selection of the two groups, treatment objectives were explained to them and their families and participating or not participating in the study were shouldered to the patients. The researchers had predicted 3 phases for the study. The first one was the pre-test phase. This step had been included to examine the

conditions of the patients' presence in the study which lasted 2 months. In this phase, general health questionnaire and addiction severity index were completed. The second phase, which lasted 3 months, was related to the implementation of matrix intervention for groups. The third phase was accomplished with the repeated completion of general health questionnaire and addiction severity index immediately after the intervention. Morphine and stimulant urine test was also conducted by the nurse once a week without prior notice. In this study, in case some participants were willing to use an alternative drug, they were excluded from the study. In the following, 9 men and 4 women out of 91 participants were excluded from the research for this reason. During the intervention, 5 other patients left the research project; therefore, only 36 men and 37 women remained up to the end.

### **Instrument**

1. **Addiction Severity Index:** This scale (Fifth Edition) was used to evaluate the clinical status of patients (McLellan et al., 1992). This index is a semi-structured interview that is conducted by trained researchers face to face with patients. This questionnaire collects the patients' problems in 7 areas during the last 30 days, last year, and over the life. An overall composite score (1-0) is obtained for each section which ranks the position of the individual in that part. Thus, if the aforementioned sections take more than 6 months, the total score is obtained; otherwise, a zero score is given. This instrument contained 116 items, among which 8 items are related to medical status, 21 items are about employment status, 24 items are in connection with alcohol and drug abuse, 27 questions are about the legal status, 23 questions are related to family support, and 13 items focus on psychiatric status of the patients. A diminution of the severity of addiction is interpreted based on the obtained scores on the above-mentioned 7 areas. The evaluation of the reliability and validity of the Persian version of this scale has been done by Atefvahid, Zareidoost, & Panaghi (in press).

2. **General health questionnaire:** The short version of the questionnaire was designed by Goldberg & Hillier in 1979 for screening non-psychotic psychiatric disorders in treatment centers and other communities. This scale has the highest usability in the diagnosis of psychiatric disorders and gives a continuum of mental health status by means of which it will be possible to calculate the probability of having the disorder at present. This questionnaire is composed of four subscales, namely somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. There are 7 items in each subscale. The items are scored through a Likert scale ranging from absence of symptoms (0) to the definite presence of symptoms (3) and lie in the form of "0, 1, 2, 3". In addition to the scores of each subscale, there is a total score. The cutoff score of 23 has been fixed to differentiate healthy subjects from patients suspected of

mental disorders. Taghavi (2001) evaluated the reliability of general health questionnaire via test-retest method, Cronbach's alpha, and split-half methods and the resultant coefficients were equal to .70, .93, and .90, respectively. Construct and concurrent validity of the instrument have also been reported to be desirable.

## Procedure

Matrix basic guide was developed with funding from National Institute on Drug Abuse (Rawson et al., 1995) and was evaluated by the Substance Abuse and Mental Health Services Administration (Rawson et al., 2004). This multi-dimensional model was developed as a comprehensive package of health strategies that had been combined together to create a coherent experience for outpatient treatment. The structural sessions pertinent to this scale were composed of three pre-sessions and 24 to 36 sessions of structural psychotherapy with a specific agenda. Each session has a predetermined content and structure which lasts 45 minutes. The participants are assigned some tasks in each session (Makri, 2011). The following table presents a summary of the treatment sessions.

**Table 1: Summary of Matrix Intensive Sessions (fourth edition)**

<i>Sessions</i>	<i>Content of sessions</i>
<b>1<sup>st</sup> session</b>	Why do we stop taking drugs (scale of change), task assignment
<b>2<sup>nd</sup> session</b>	Triggers (stimulating factors), task assignment
<b>3<sup>rd</sup> session</b>	External triggers, task assignment
<b>4<sup>th</sup> session</b>	Internal triggers, task assignment
<b>5<sup>th</sup> session</b>	Recovery phase, task assignment
<b>6<sup>th</sup> session</b>	Family distrust, task assignment
<b>7<sup>th</sup> session</b>	Energy reduction, task assignment
<b>8<sup>th</sup> session</b>	Incorrect use of medication, task assignment
<b>9<sup>th</sup> session</b>	Temptation, how to grow up and behave, task assignment
<b>10<sup>th</sup> session</b>	Thoughts and feelings shaping behavioral use, task assignment
<b>11<sup>th</sup> session</b>	Boredom and depression, task assignment
<b>12<sup>th</sup> session</b>	Relapse prevention, task assignment
<b>13<sup>th</sup> session</b>	Work and recovery, task assignment
<b>14<sup>th</sup> session</b>	Shame and guilt, task assignment
<b>15<sup>th</sup> session</b>	Staying busy, task assignment
<b>16<sup>th</sup> session</b>	Motivation for recovery, task assignment
<b>19<sup>th</sup> session</b>	Truthfulness, task assignment
<b>20<sup>th</sup> session</b>	Complete innocence, task assignment
<b>21<sup>st</sup> session</b>	Addictive sexual relations
<b>22<sup>nd</sup> session</b>	Review of the last session and answering questions

## Results

Descriptive statistics of mental health components for each group are presented in the table below.

**Table 2: Descriptive statistics of mental health components for each group**

<i>Variables</i>	<i>Groups</i>	<i>Pretest</i>		<i>Posttest</i>	
		<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
<b>Somatic symptoms</b>	Males	.97	1.06	.18	.42
	Females	.92	1.09	.30	.46
<b>Anxiety</b>	Males	15.62	3.70	7.85	2.63
	Females	18.41	2.70	11.27	2.42
<b>Depression</b>	Males	17.00	2.42	10.31	2.97
	Females	15.32	3.17	8.32	3.10
<b>Social dysfunction</b>	Males	12.97	2.49	5.97	1.95
	Females	13.08	1.99	4.84	2.18

MANCOVA test (multivariate analysis of covariance) should be employed to compare the efficacy of the matrix elements in the components of general health and addiction severity abuse between female and male crystal users. There are some assumptions to be allowed to use this analysis. Box's Test was used to check the assumption of equality of covariance matrices. The results of this test implicated the satisfaction of this assumption ( $P > .05$ ,  $F = .731$ , Box's  $M = 7.763$ ). As well, Levene's test was used to check the assumption of the equality of error variances, the results of which are presented in the following table.

**Table 3: Levene's test of equality of error variances for the components of mental health**

<i>Variables</i>	<i>F</i>	<i>Df</i>	<i>Sig.</i>
<b>Somatic symptoms</b>	3.03	74	.09
<b>Anxiety</b>	.27	74	.60
<b>Depression</b>	2.57	74	.11
<b>Social dysfunction</b>	2.08	74	.15

Considering the satisfaction of the required assumptions, multivariate covariance analysis was performed. The results indicate the significance of the difference between groups ( $P < .0001$ ,  $F = 9.369$ , Wilks'  $\Lambda = .359$ ). Univariate analysis of variance was used to examine differences in patterns as follows.

**Table 4: The results of univariate analysis of variance representing gender differences in mental health components**

<i>Variables</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>	<i>Eta squared</i>
<b>Somatic symptoms</b>	.13	.581	.448	-
<b>Anxiety</b>	160.48	25.004	.0005	.263
<b>Depression</b>	50.616	5.562	.02	.074
<b>Social dysfunction</b>	12.374	2.854	.10	-

As it is displayed in the above table, there is a significant difference in anxiety and depression between men and women. According to the descriptive statistics of the variables, it can be stated that depression in women has experienced a greater reduction compared with men while anxiety in men has undergone a greater reduction compared to women.

**Table 5: Descriptive statistics of addiction severity index components for each group**

<i>Variables</i>	<i>Groups</i>	<i>Pretest</i>		<i>posttest</i>	
		<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
<b>Employment status</b>	Males	.71	.31	.53	.32
	Females	.94	.23	.78	.42
<b>Family support</b>	Males	.56	.50	.51	.51
	Females	.51	.51	.49	.51
<b>Social relations</b>	Males	.63	.29	.38	.32
	Females	.67	.39	.27	.33
<b>Substance abuse</b>	Males	.48	.37	.16	.25
	Females	.48	.40	.22	.33
<b>Psychiatric status</b>	Males	.56	.23	.37	.28
	Females	.61	.21	.38	.27

Descriptive statistics of addiction severity index components are presented in Table 5 for each group and test. MANCOVA test (multivariate analysis of covariance) should be used to explore the difference in the effectiveness of matrix treatment components in the components of general health and addiction severity between female and male drug abusers.

There are some assumptions to be allowed to use this analysis. Box's Test was used to check the assumption of the equality of covariance matrices. The results of this test suggested the satisfaction of this assumption ( $P > .05$ ,  $F = .656$ , Box's  $M = 10.620$ ). As well, Levene's test was used to check the assumption of the equality of error variances, the results of which are presented in the following table.

**Table 6: Levene's test of equality of error variances for the components of addiction severity**

<i>Variables</i>	<i>F</i>	<i>Df</i>	<i>Sig.</i>
<b>Employment status</b>	2.13	74	.37
<b>Family support</b>	.77	74	.73
<b>Social relations</b>	1.77	74	.32
<b>Substance abuse</b>	1.38	74	.26
<b>Psychiatric status</b>	.11	74	.74

Considering the satisfaction of the required assumptions, multivariate covariance analysis was performed. The results indicated the non-significance of the difference between groups (Wilks' Lambda=.132,  $F=1.973$ ,  $P<.05$ ).

### **Discussion and conclusion**

The present study was aimed at comparing the therapeutic effects of matrix treatment method on the severity of addiction and mental health between female and male methamphetamine abusers. According to the study results, no significant difference was found between males and females in any of the components of addiction severity index after treatment. However, matrix treatment method could bring about a significant difference in the general health scores of female and male crystal users. Post-hoc test results showed that the two subscales of anxiety and depression have brought about changes in females and males, respectively. In other words, depression in women experienced a greater reduction compared with men while anxiety in men underwent a greater reduction compared to women. These results are in contradiction with the findings obtained by Hser et al (2005). They examined treatment consequences in female and male amphetamine users and reported significant differences for all the subscales of addiction severity index for both genders. Hser and his colleagues' study (2004) showed that the probability of finding jobs for men is higher than that in women after treatment. This finding is also in contradiction with the results of the present study as no significant difference was observed between both genders in terms of employment status before and after treatment. In line with the findings obtained by Hser et al. (2004), a significant difference was found in the results of mental health between women and men. Hides et al. (2010) also found cognitive-behavioral therapy effective in the improvement of depression, anxiety, substance abuse, coping skills, and performance of individuals. This finding is consistent with the findings of the current study in terms of depression and anxiety.

This research is considered as a new study in that it has focused on the comparison of the therapeutic effect of the matrix treatment method on the psychological indicators of female and male drug abusers. Such studies have been rarely conducted. Therefore, the researchers were confronted with serious limitations in comparing the results with those of other similar studies. To interpret the obtained results, it seems that providing a treatment protocol should suit the needs of patients. Since gender differences in withdrawal symptoms and history of psychiatric illness have been previously referred to in various studies, it is revealed that there are gender differences in each culture and nationality and it is not possible to reach an overlap in such results between the two genders in different cultures. Therefore, the type of gender differences should be examined in Iranian culture at first which is not possible except by conducting researches on very large samples. It is obvious that if a protocol is designed in the absence

of research findings, it will face many health challenges. The present findings and other research findings in this area particularly highlight the need for effective treatments for drug abuse and stimulant dependence, but it is not necessarily required to develop new and innovative treatment approaches for methamphetamine dependent clients. Instead, available complementary therapies accompanied by outreach services for monitoring methamphetamine patients are probably more productive for their drug and psychiatric problems. In this study, like other studies, there are some limitations which need to be considered in generalizing the study results. The results are generalizable solely to the crystal abusers in Tehran; therefore, the generalization of the results to other communities and cities should be made with caution. Given that the current study sample has been selected from crystal abusers, the present results are not generalizable to other kinds of drug users.

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