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Original Article

The effectiveness of motivational enhancement therapy for addiction treatment and attitudinal ambivalence towards addiction

Farzin Bagheri Sheykhangafshe [1*], Khazar Tajbakhsh [2], Vahid Savabi Niri [3], Fatemeh Eghbali [4] and Reza Shabahang [5]

1. Ph.D. Student of Psychology, Faculty of Humanities, Tarbiat Modares University, Tehran, Iran.
2. B.A in Psychology, Faculty of Literature and Human Sciences, University of Guilan, Rasht, Iran.
3. M.A. in Clinical Psychology, Islamic Azad University of Ardabil Branch, Ardabil, Iran.
4. M.A. in General Psychology, Allameh Tabatabai University Campus, Tehran, Iran.
5. M.A. in General Psychology, Faculty of Psychology and Educational Sciences, University of Tehran, Tehran, Iran.

Abstract

The present study aimed to investigate the effectiveness of motivational enhancement therapy on addiction treatment barriers and attitudinal ambivalence towards addiction. This study is quasi-experimental research with a pretest-posttest control group design. The population included addicts who were referred to addiction treatment centers in Rasht city in 2022. Seventy-four drug-addicted army conscripts were recruited by convenience sampling and were randomly assigned to two experimental and control groups. The Barriers to Treatment Inventory (BTI) and the Attitudinal Ambivalence Scale were used to measure views on addiction treatment barriers and attitudinal ambivalence towards addiction. Motivational enhancement therapy was provided for the experimental group participants in nine sessions. In the end, the data analysis was done by multivariate analysis of covariance (MANCOVA) using SPSS.24 software. MANCOVA results indicated that motivational enhancement therapy significantly affects views on barriers to treatment and attitudinal ambivalence towards addiction ($p < 0.001$). Having motivation in any work can be effective, but if these motivations are not well managed and controlled, they bring many harms and dangers to the individual and the society. It should be acknowledged that motivational components play a very colorful role in the beginning, continuation, withdrawal, and return of addiction. In this regard, investigating motivational interventions related to addiction is of great importance.

Keywords

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Introduction

Addiction disorders are considered compulsive use disorders (Kwako, Bickel, & Goldman, 2018), and their key features are the repetition of thinking and participation in a specific behavior (Yuen et al., 2022). Addiction is the inability to choose freely or stop or continue behaving and experiencing adverse behavioral consequences (Rawat, Petzer & Gurayah, 2021). To date, the concept of addiction has been outlined in many dimensions such as eating, using the Internet, shopping, and even working (Zilberman, Yadid, Efrati, Neumark, & Rassovsky, 2018), of which drug abuse is one of the most prominent and common dimensions (Shabahang, Bagheri Sheykhangafshe, Mousavi, 2019) that leads to serious bodily and mental problems (Ye & Liu, 2023).

The National Institute on Drug Abuse (NIDA) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA) define addiction as a chronic relapsing brain disease (MacKillop, 2020) specified by drug obsessive use and search (Ruisoto & Contador, 2019). Drug addiction is specifically defined based on drug-related behaviors, also including cognitions, emotions, and other individual experiences (Rogers, 2017). In other words, drug addiction is considered a state of changing behavior to a habit (Everitt & Robbins, 2016), in which drugs create pleasure modes and moderate tensions. Meanwhile, repeated use of drugs results in adaptive changes in the central nervous system that cause tolerance, physical dependence, sensitization, cravings (psychological dependence), and relapse (Shabahang, Rezaei, & Bagheri Sheykhangafshe, 2018).

Corresponding author: Department of Psychology, Faculty of Humanities, Tarbiat Modares University, Tehran, Iran.
E-mail: **farzinbagheri@modares.ac.ir**

According to studies on drug addiction in recent decades, addiction treatment is still considered a challenging issue, among which the barriers to addiction treatment and drug addicts' ambivalence toward addiction are among the most important challenges. Overall, addiction treatment barriers point to the challenges in the route of addiction treatment (Venegas, Donato, Meredith, & Ray, 2021). In this regard, Rapp et al. (2006) report that treatment barriers are the absence of a problem, negative social support, fear of treatment, privacy concerns, time conflict, poor treatment availability, and admission difficulty. In another study Owen, Chen, Simpson, Timko, and Williams (2018), also cited the addiction treatment barriers like lack of problems, negative social support, privacy concerns, poor treatment availability, and admission difficulty. In addition, Smith and Marshall (2007) argue that three categories of psychological, interpersonal, and social barriers are among the most important barriers in the treatment of addiction. Research by Motyka, Al-Imam, Haligowska and Michalak (2022), van der Pol et al. (2013), Stringer and Baker (2018), and Lister et al. (2020) also indicate some barriers to addiction treatment services. Also, Rahmati, Zeraat Herfeh, and Hosseini (2019) report that easy access to drugs, keeping in touch with drug users, stability of attitudes, lack of/insufficient social support, coercive treatment, and neglecting Narcotics Anonymous (NA) meetings were barriers to the process of quitting addiction permanently and escalating relapse. In fact, according to previous studies, there are still significant barriers among which drug abusers' attitude and their motivation to overcome treatment challenges are the most important items.

Ambivalence is another issue that can be considered in addiction treatment. In general, ambivalence is defined as an approach-avoidance conflict (Fast, 2021). In other words, it refers to the simultaneous existence of positive and negative evaluations of an attitude object (Wallace et al., 2020). Meanwhile, ambivalence can also be considered in addiction. The drug abuser is ambivalent or unsure about whether he/she is addicted (Englander et al., 2018) and the drug abuser seemed unsure about treatment and its necessity (Emiliussen, Andersen, & Nielsen, 2017). In this regard, Lipkus et al. (2005) and Mays et al. (2020) talk about Attitudinal Ambivalence. Daeppen (2016) also points out the importance of ambivalence in addiction. Many other studies such as Horay's study (2006), emphasize ambivalence in substance abuse treatment. In addition, Schlauch, Rice, Connors, and Lang (2015) mentioned the ambivalence model of craving to describe the approach (desire to use) and avoidance (desire to not use) in addiction.

Overall, there are still many barriers to addiction treatment consistent with previous studies and drug abusers are exposed to attitudinal ambivalence. Accordingly, providing interventions to improve the present situation is necessary and motivational interventions can be very useful.

To date, many studies have been done on addiction and its various neurological, cognitive, emotional, social, and behavioral dimensions, and motivational addiction is among the most important aspects of the addiction phenomenon. According to studies, motivation and motivational dimensions are among the factors that can be outlined concerning addiction and its treatment. To the extent that even Volkow, Wise and Baler (2017) talk about the motivation for addiction. Motivational structures play an important role in the onset and continuance of addiction according to many theoretical approaches related to addiction. In this way, people use drugs to gain pleasure and avoid or escape pain as fundamental motivations (Haramain & Afiah, 2022). Oginsky et al. (2016), and Choi (2019), all emphasize the importance of motivation to start and continue drug addiction. In line with this, Köpetz Lejuez, Wiers, and Kruglanski (2015) report that addictive behaviors, like other types of behaviors, are influenced by motivations and those play an important role in vulnerability to addiction. Sjoerds, Luigjes, van den Brink, Denys, and Yücel (2014) say that motivational items are effective in human drug addiction. Another study by DiClemente et al. (2017) states that motivation can be effective in addiction behaviors as a dynamic balance between costs and achievements as with other behaviors. The results of Baumeister and Nadal's (2017) study show the importance of motivation, control, and the pleasure habit of addiction. Gladwin et al. (2011) also emphasize control and motivation in addiction interaction. Kalivas, Volkow, and Seamans (2005) outline unmanageable motivation in addiction as well. It should be noted that motivational components are of important role in addiction start, continuation, giving up, and return and motivational plans can be useful interventions in addiction and treatment challenges (Ragona, Mesce, Cimino & Cerniglia, 2023).

Considering the importance of motivational components in addiction, the question is raised that whether addiction motivational interventions can affect addiction treatment barriers and attitudinal ambivalence. Previous studies have emphasized motivational mechanisms for the understanding of the initiation and maintenance of addictive behaviors (see Köpetz et al., 2015). It is evidenced that motivation is a significant contributor to initiating and sustaining recovery (see Groshkova, 2010). Motivational enhancement therapy is an intervention that can be considered in this regard. Galloway, Polcin, Kielstein, Brown, and Mendelson (2007) outlined a motivation plan for drug dependence. Motivational enhancement therapy is a compressive intervention for addiction treatment made based on motivational interviewing techniques. Indeed, motivational enhancement therapy can be resulted in motivation increase by calling internal ambivalence of an individual including the reasons for continuing drug use and making changes to it. In other words, motivational enhancement therapy results to improve treatment motivation by using techniques of reflection, empathy, resistance, and self-efficacy as also other strategies as like as providing feedback and information, directing the subject into an examination of ambivalence about their use, eliciting

motivational statements, and developing a change plan. Motivational enhancement therapy is an intervention that can be considered concerning addiction treatment barriers and attitudinal ambivalence (Feldstein et al, 2022).

Considering the very negative consequences of addiction for individuals, families, and society, the failure of many attempts to get rid of addiction, as well as considering the role of motivational dimensions in the initiation, continuation, and withdrawal of addiction, investigating the effect of addiction-related motivational improvement treatment on the components of very important factors such as the aptitude for addiction and the readiness and desire for treatment of addicts can be very effective in understanding the motivational aspects of addiction as well as facilitating the process of addiction withdrawal, a subject that has received very few direct and specific studies. Especially the fact that in the country, very little attention has been paid to the motivational return of addiction. While investigating the motivation in addiction and the impact of motivational programs related to addiction can lead to increase quit attempts, reduced return and relapse, increased quit success, and as a result, reducing many costs. More specifically, the study of related motivational programs or addiction, such as motivational facilitation treatment, on very important components such as the tendency to addiction and the desire to quit, can bring many fundamental and practical benefits at the individual, interpersonal and collective levels. In this regard, the present study aimed to investigate the effectiveness of motivational enhancement therapy on addiction treatment barriers and attitudinal ambivalence toward addiction.

Method

Participants

This study is quasi-experimental research with a pretest-posttest control group design. The main purpose of the study was to investigate the effectiveness of motivational enhancement therapy on addiction treatment barriers and attitudinal ambivalence towards addiction. The population included addicts who referred to addiction treatment centers in Rasht city in 2022. According to the medical records and results of screening, 74 drug-addicted were recruited by convenience sampling method. After sampling, the participants were randomly assigned to either the experimental or waitlist control groups. Inclusion criteria were as follows: age between 18 to 30 years, referral of a psychiatrist or physician according to the primary diagnosis of substance dependence based on the fifth revised edition of the Diagnostic and Statistical Manual of Mental Disorders-5th Edition (DSM-5), being literate (having cycle degree), and personal desire. Excluding criteria were: the occurrence of serious mental or physical disorders, absence of more than 1 session causing problems in the process of the intervention, lack of proper interaction and cooperation, and participation in other therapies simultaneously. The Barriers to Treatment Inventory (Rapp et al., 2006) and the Attitudinal Ambivalence Scale (Lipkus et al., 2005) were used to measure addiction treatment barriers and attitudinal ambivalence towards addiction. Before the intervention, participants responded to study measurements, then the participants in the experimental group underwent motivational enhancement therapy in 9 sessions of 90 minutes (1 session per week). The content of the motivational enhancement therapy sessions has been presented in Table 1 summarily. After the intervention, a post-test was executed on both the experimental group and the wait-list control group. Data analysis has been done by multivariate analysis of covariance (MANCOVA) and using $SPSS_{24}$ software.

Ethical statements

All ethical considerations such as personal consent, personal information retention, and informed participation were considered by the Helsinki Ethical Principles (World Medical Association, 2013). Before starting the research, informed consent was obtained from all the participants. At the end of the study, due to ethical considerations, the intervention was also offered to the wait list control group.

Instrument

Barriers to Treatment Inventory:

This scale was developed by Rapp et al (2006). The Barriers to Treatment Inventory is composed of 25 items that measure views on barriers in the treatment process across the absence of a problem, negative social support, fear of treatment, privacy concerns, time conflict, poor treatment availability, and admission difficulty aspects. The Barriers to Treatment Inventory has a five-point Likert scale with response choices ranging from 1 (disagree strongly) to 5 (agree strongly). The total Barriers to Treatment Inventory score is from 25 to 125. Higher scores express a higher level of perceived barriers to treatment. According to Rapp et al.'s study (2006), the Barriers to Treatment Inventory has appropriate psychometric properties. The findings of EFA and CFI confirmed seven latent constructs. The validity of the inventory was satisfactory. In addition, the Cronbach alpha of the subscales has ranged from 0.65 to 0.86 which indicates appropriate internal consistency of the scale. In the present research, the alpha reliability was .88.

Attitudinal Ambivalence Scale:

The Attitudinal Ambivalence Scale is a seven-item and single-factor instrument for measuring addiction ambivalence (Lipkus et al, 2005). The purpose of the Attitudinal Ambivalence Scale is to measure the attitudinal ambivalence toward addiction. This scale has a six-point Likert scale with response choices ranging from 1 (strongly disagree) to 6 (strongly agree). The questionnaire yields a summed score with a range from 7 to 42 higher scores expressing higher attitudinal

ambivalence toward addiction. Lipkus et al. (2005) reported adequate reliability and validity of the questionnaire. According to the EFA results, items formed one factor (alpha = 0.79) and explained 44% of the variance (eigenvalue = 3.10). CFI findings also confirmed the seven-item one-factor solution. In addition, Cronbach's alpha at baseline, four- and eight-months post-baseline were .79, .81, and .84, respectively. In the present study, the Attitudinal Ambivalence Scale was internally consistent as well (α= .87).

Table 1. The summary of motivational enhancement therapy

Sessions	Content
1	Structured exercises designed to elicit information, prepare for the sessions, problem identification and feedback
2	Structured exercises designed to elicit information, focusing on the theme of ambivalence
3	Developing the change plan, identifying possible obstacles
4 to 8	Booster sessions, reviewing events of the past week, relapses, and other concerns raised by the participant, focusing on the participant's change plan, ambivalence towards the change plan, and revision of goals
9	Enhancing the participant's commitment to the therapeutic contract, discussing the action plan and the participant's probable problems

Results

The mean and standard deviation of the age of the experimental group addicts was 21.63±4.86 years and of the control group addicts was 22.37±5.14 years. The results of the chi-square test showed that the experimental and control groups had no significant differences in terms of education, marital status, and age grouping (p > 0.05).

Table 2. Descriptive indices of study's variables in control and experimental groups

Variables		Groups	Mean	SD	K-S Z	P
Addiction Treatment Barriers	Pre-test	Experimental Group	72.05	6.89	0.142	**0.061**
		Control Group	72.33	7.04	0.125	**0.066**
	Post-test	Experimental Group	55.75	8.10	0.129	**0.057**
		Control Group	71.47	6.37	0.118	**0.131**
Attitudinal Ambivalence	Pre-test	Experimental Group	21.88	3.06	0.108	**0.089**
		Control Group	21.02	4.08	0.123	**0.106**
	Post-test	Experimental Group	32.91	3.45	0.114	**0.065**
		Control Group	21.72	4.54	0.111	**0.092**

The mean and standard deviation of the addiction treatment barriers and attitudinal ambivalence pre-test and post-test scores in the experimental and control groups are presented in Table 2. In this table, the results of the Kolmogorov–Smirnov test (K-S Z) are reported to verify the normal distribution of variables in the two groups. According to this table, the Z-statistic of the Kolmogorov–Smirnov test was not significant for all variables. Therefore, it can be concluded that the distribution of variables is normal.

For investigating the effectiveness of motivational enhancement therapy on addiction treatment barriers and attitudinal ambivalence, multivariate analysis of covariance (MANCOVA) was used. The results of Levine's test for investigating homogeneity of dependent variables variance in groups showed that the variance of addiction treatment barriers ($F_{1,70}$=2.34, p = 0.142 > 0.05) and attitudinal ambivalence ($F_{1,70}$=2.89, p = 0.107 > 0.05) are equal in groups. The results of the M Box test for checking the equality of the covariance matrix of dependent variables between the experimental and control groups also showed that the covariance matrix of dependent variables of the two groups was equal (M Box= 6.194, F= 2.01, p = 0.111>0.05). The significance level of the Box test is greater than 0.05 and this assumption is established. The results of Chi-square and Bartlett's tests for sphericity or significance of the relationship between addiction treatment barriers and attitudinal ambivalence showed that the relationship between them was significant (p <0.05, $\chi 2$ =33.41, df=2). Another important assumption of multivariate analysis of covariance is the homogeneity of regression coefficients. It should be noted that the test of homogeneity of regression coefficients was investigated through the interaction of dependent and independent variables (intervention method) in the pre-test and post-test. The interaction of these pre-tests and post-tests with the independent variable was not significant and indicates the homogeneity of the regression slope, so this assumption is established. Due to the assumptions of multivariate analysis of covariance, the use of this test will be permitted. Multivariate analysis of covariance was performed to find out the differences between groups (Table 3).

Table 3. The results of multivariate analysis of covariance on mean post-test scores

Test	Value	F	P	Effect Value
Pillai's effect	0.872	228.635	0.001	**0.872**
Wilks Lambda	0.128	228.635	0.001	**0.872**
Hoteling trace	6.825	228.635	0.001	**0.872**
Roy's largest root	6.825	228.635	0.001	**0.872**

According to Table 3, the results showed the effect of the independent variable on the dependent variables; in other words, the experimental and control groups had significant differences at least in one of the variables of addiction treatment barriers and attitudinal ambivalence, that 87% of total variances of the experimental and control groups were due to the independent variable regarding the calculated effect size. The statistical power of the test is also equal to one, indicating the adequacy of the sample size. However, to determine which domains are significant, a univariate analysis of covariance was used in the MANCOVA, the results of which are reported in table 4.

Table 4. Results of univariate analysis of covariance on the mean of post-test scores of dependent variables in two experimental and control groups

Variables	SS	DF	MS	F	P	Effect Value
Addiction Treatment Barriers	4250.258	1	4250.258	111.856	0.001	**0.622**
Attitudinal Ambivalence	2041.119	1	2041.119	168.122	0.001	**0.712**

According to table 4, the F statistic for addiction treatment barriers (168.122) and attitudinal ambivalence (168.12) was significant at 0.01 levels. These findings indicate that there is a significant difference between groups in these variables. Also, according to the calculated effect size, 62% of addiction treatment barriers and 71% of attitudinal ambivalence were due to the effect of the independent variable. As a result, it can be stated that motivational enhancement therapy has significantly reduced addiction treatment barriers and increased attitudinal ambivalence in addicts.

Discussion

The present study was conducted to investigate the effectiveness of motivational enhancement therapy on addiction treatment barriers and attitudinal ambivalence toward addiction. The results showed that motivational enhancement therapy is an effective method to decrease addiction treatment barriers and increases attitudinal ambivalence towards addiction. That is, providing motivational enhancement therapy to the participants of the experimental group improved their views on barriers to treatment as well as increased attitudinal ambivalence toward addiction. The findings of the present study are in line with previous research confirming that motivation is an important factor in views on barriers to treatment and addiction ambivalence among which motivational enhancement therapy can be an effective intervention (Köpetz et al., 2015; Groshkova, 2010; Galloway et al., 2007). In other words, many of the barriers to addiction treatment are derived from intrinsic and motivational problems in which motivational interventions can be helpful. Considering the results, motivational enhancement therapy can be prominent in facilitating addiction treatment.

Motivation is an important issue in addiction (Volkow et al., 2017). Indeed, motivation can affect addiction behavior as well as other behaviors as a dynamic balance (Feldstein et al., 2022) and these motivations play an important role in views on barriers to treatment and addiction ambivalence. Having motivation in any job can be effective but unmanaged and uncontrolled motivations can cause much damage to individuals and society (Kalivas et al., 2005). It should be noted that motivation components play an important role in starting, continuing, quitting, and returning to addiction (Baumeister & Nadal, 2017). Based on the theoretical interchange model, motivation is important because of including a plan to quit (pre-thinking) and to continue quitting addiction behaviors (Abiola, Udofia, Sheikh, & Sanni, 2015).

Indeed, starting and continuing any work is affected by some motivations. Quitting addiction and willingness to treatment can also be affected by it. In this line, a motivational enhancement plan based on motivational interviewing techniques can be a helpful intervention in treatment barriers to addiction and ambivalence (Fast, 2021). In this treatment, the patient gets acquainted with complications of opposite views and emotions to increase motivation to quit addiction by answering this question that why he/she is consuming drugs and why should quit it. In the process of motivational enhancement therapy, decreasing drug use is considered by using techniques of reflection, open questions, sympathy, summarized sentences, increased resistance, and self-efficiency approval as well as strategies of direct intervention, providing information, guiding the individual to assess drug consumption complications, motivational words and providing plans to change (Ragona et al., 2023). Indeed, motivational enhancement therapy targets motivations related to addictions (the cause of addiction, continuing and quitting it). This means that this plan results in changes in their motivations for using drugs and changes views on barriers to treatment and addiction ambivalence in

addicted persons (Haramain & Afiah, 2022).

Overall, regarding motivation theories and previous research, motivational enhancement therapy can be a useful tool to improve addicted persons' views of treatment barriers and increase their addiction ambivalence and finally increase the willingness to quitting drugs and be successful in quitting treatments (Köpetz et al., 2013). So, it is recommended that theoretical organizations such as universities emphasize more on addiction motivational dimensions and operational organizations such as quitting camps should also use motivational plans (as motivational enhancement plans) either independently or in combination with other interventions (Oginsky et al., 2016; Choi, 2019).

The gender of the participants is an issue that should be noted in future research. Future studies are recommended to consider addicted women to gain more comprehensive information about the motivational treatment plan and its effect on treatment barriers to addiction and addiction ambivalence in different genders. Also, the population of this research was the men of Rasht city in 2022, which should be cautious in generalizing the findings of this research. Accordingly, it is recommended that studies consider whether previous treatments and successes or failures in it can influence the effectiveness of motivational enhancement treatment. The follow-up measures weren't used in the present study. It would also be desirable to have follow-up measures to examine how long the effects of the intervention were maintained.

Conclusion

According to the findings, how to consider the addiction treatment barriers can be influenced by motivation. In addition, motivation can affect addiction ambivalence. Meanwhile, motivational enhancement therapy is a valuable tool to control negative views on treatment barriers and increase addiction ambivalence. Based on the study results, many of the barriers to addiction treatment are derived from intrinsic and motivational problems in which motivational interventions can be helpful. Considering the results, motivational enhancement therapy can help facilitate addiction treatment.

Conflict of Interests

The authors state that there is no conflict of interest in this study.

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ORCID

Farzin Bagheri Sheykhangafshe:
https://orcid.org/0000-0002-3435-3870

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