

Abstract

Objective Different studies have been carried out on the effectiveness of psychological therapies in the treatment of addiction and reduction of its long-term complications. This study aimed to aggregate and combine the results of previous studies and to estimate the effectiveness of these therapies in the relapse prevention of drug addiction through meta-analysis method.

Method: This meta-analysis was conducted on the published articles in the databases of Sid, Magiran, and Irandoc. After searching, the screening and assessment of the quality of articles were conducted and the inclusion and exclusion criteria were applied. In the initial search, the number of 4292 articles was extracted. After the removal of duplicates and evaluation of the titles and abstracts, 31 articles were selected. Then, the full texts of articles were reviewed and 19 articles were finally recognized eligible for inclusion in the meta-analysis. The statistical analysis of the obtained data was carried out using STATA (Version 11). Pooled RD extracted from results and Metan command were used to analyze the data.

Results: The meta-analysis conducted on studies indicates the significant effectiveness of psychological-based therapy in addiction relapse prevention.

Conclusion: Regarding the effectiveness of psychological-based therapies in addiction relapse prevention, policy-makers should pay more attention to this issue and provide the foundation for the application of exercises by providing the necessary training to psychologists of addiction treatment centers.

Keywords: addiction, psychological therapy, relapse prevention, meta-analysis

The Effectiveness of Psychological Interventions in Addiction Relapse Prevention: A Meta-Analysis

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Introduction

Addiction to drug and psychedelics is one of the most important challenges for the world's health system and also for our country, Iran. Addiction is considered as a complex process in the human brain (Goldstein, Fong, Rosenthal, & Tavares, 2007), which has many harmful consequences in the physical, psychological, social and economic domains. In Iran, about 3,000 people die annually due to the chronic complications of drug abuse (Afshar, 2016). The United Nations Office on Drugs and Crime (2005) has estimated that the number of drug users in the world was 200 million, representing a high percentage of the world's total population. Along with other evident changes in the history of human societies, addiction and addictive behaviors have also undergone a change, and the patterns of consumption and various substances have been appeared. The very rapid change in the consumption pattern from traditional substances to industrial addictive substances is one of the examples of these changes and also a worrisome challenge for human systems (Sarami, Ghorbani, & Minooei, 2013). In our country, according to the official reports and the existing research, there have been three major changes in this area over the last three decades: the change in the age of onset for drug use and the prevalence of addiction in children and adolescents, the rapid change in the consumption pattern from traditional substances to industrial addictive substances, as well as the prevalence of addiction, especially addiction to psychedelics among females (Noori et al., 2008; Taremian, Bolhari, & Peyravi, 2010; Sarami et al., 2013; Sarami, Ghorbani, & Taghavi, 2013).

Investigating the mere pharmaceutical maintenance treatments without the psychosocial interventions has revealed that these therapies have not made much success (Lotfi Kashani, Mojtabaei, & Ali Mehdi, 2013; Roozen et al., 2006). Therefore, it is obvious that addiction, like other disorders, requires management of treatment over time (Daley et al., 2005). Different addiction treatments address a variety of goals that are generally centered around three main axes. These three axes include discontinuation of physical dependence to the substance, discontinuation of psychological dependence, and the prevention of relapse. Despite the scientific advances in the treatment of addiction, recurrence and relapse have remained as a major challenge in the treatment of addiction (Witkiewitz, & Marlatt, 2004). Relapse means disability and failure in the continuation of a behavioral change and starting a behavior following a period of abandonment (withdrawal) of that behavior (Marlat, & Gordon, 1985). Narimani (2000) stated that the most important causes of addiction relapse are the addicts' unemployment, unfamiliarity with methods of dealing with problems, pollution of the living environment, friends' addiction, lack of planning for leisure time, non-participation in the therapeutic groups, and mental disorders such as anxiety and depression. Rejection from family and community, the sense of mental coercion for consumption, and family conflicts are also

considered by the experts as causes of addiction relapse (Zeinali, 2010; Shargh, Shakibi, Neysari, & Aliloo, 2011). McKay, Franklin, Patapis, & Lynch (2006) acknowledged that most substance abusers return to drug use within 90 days after starting the rehabilitation treatments and detoxification periods.

Along with the studies investigating the causes of addiction relapse, a considerable amount of research have also been conducted on the effectiveness of various psychological treatments in relapse prevention as a major challenge in the treatment of addiction. In general, the effectiveness of psychological treatments has been reported to be moderate or even moderate to high (Dutra et al., 2008). Research evidence suggests that the cognitive-behavioral approach plays a significant role in the addiction relapse prevention both as a single treatment and as part of a hybrid or combinatory treatment (McHugh, Hearon, & Otto, 2010). Mindfulness-based treatments, known as third-generation treatments, can lead to increasing the effectiveness of treatment and relapse prevention by reducing the symptoms of the withdrawal; the focus of these treatments is on the concepts such as acceptance, self-awareness, presence in the moment, here, and now, and observation without judgment (Witkiewitz, Marlatt, & Walker, 2005; Witkiewitz et al., 2014). Furthermore, Mollazadeh and Ashouri (2009) investigated the effectiveness of cognitive-behavioral group therapy in preventing relapse and improving the addicts' mental health. The results of the analysis showed that cognitive-behavioral therapy had been effective in the addicts' mental health and relapse prevention. Naseri et al. (2014) investigated the efficacy of a dual focus schema therapy in the treatment of the male addicts with antisocial personality disorder. The result showed that the participants of this study had relatively similar early maladaptive schemas and tolerance styles, and that the treatment significantly reduced the psychological dependence, drug use, high risk behaviors, and improved physical and psychological health, and individual or social actions. Unfortunately, despite years of research on the treatment of addiction and despite the development, implementation, and exploring the various pharmaceutical and non-pharmaceutical treatments, comprehensive research-clinical results have not been provided on the effectiveness of various treatments and one cannot be assured of the effectiveness of a treatment or superiority of a therapeutic approach to the other approaches. In Iran, despite the considerable amount of research in this field, comprehensive studies have not been carried out to combine the results of various studies. The large amount of research on the effectiveness of various addiction treatments and lack of research that focus on combining, aggregating, and comparing the findings of early studies lead to confusion among patients, therapists, and policymakers in this field. Therefore, the need for these studies is felt. Considering the above mentioned issues, the purpose of this study is to synthesize and metaanalysis of the existing studies on the effectiveness of various psychological therapies in the prevention of relapse in Iran in order to

determine the extent of the efficacy of various psychological therapies in the prevention of relapse in addicts.

Method

Population, sample, and sampling method

The present study is a meta-analysis study. The most important advantage and superiority of meta-analysis research is the integration of different results, which increases the power of research in finding the meaningful results (Tabe Bordbar, 2013). The current meta-analysis has examined the effectiveness of psychological therapies in the addiction relapse prevention in Iran. In this research, psychological therapies refer to all non-pharmacological and psychological-based interventions such as behavioral, cognitive-behavioral therapies, mindfulness, and educational interventions. The statistical population of this study is Iranian published research in domestic scientific sources on the effectiveness of the psychological therapies in addiction relapse prevention in addicts. Regardless of the time of study, the type of the substance and the demographic characteristics of the addicts were studied.

First, the number of 4292 titles of Persian and English articles was explored the related keywords and by using in the scientific databases of Sid, Magiran, and Irandoc. In order to prevent the removal of the related articles due to the insufficient power of the internal scientific databases in the multilayer search, distinct keywords were used to search and all the articles containing each of the intended keywords in their title or abstract were included in the preliminary. After studying the abstract of the articles, 31 related articles remained and other unrelated articles were identified. After a comprehensive study of the full texts of the articles and by the use of the evaluation list, 19 final articles were selected for meta-analysis. Given the fact that some articles provided the result of more than one experimental group, a total of 25 studies were studied. The criteria for inclusion to the study were: (1) The employed treatment intervention should be psychological or have a psychological component; (2) The research has been conducted in the experimental and quasi-experimental method, and the research design should include a pre-test, post-test control group design (3); The experimental group should be with substance abuse; 4) The study should be published in one of the online scientific journals; 5) The diagnostic test of urinalysis should be used for the evaluation of relapse. The exclusion criteria were: lack of access to the full text of the article, deficiency of the data required for statistical analysis, lack of relevance of the article to the subject of the study, failure to determine and measure the relapse prevention as the dependent variable and single-group, review, relational, descriptive, and without control group (comparison).

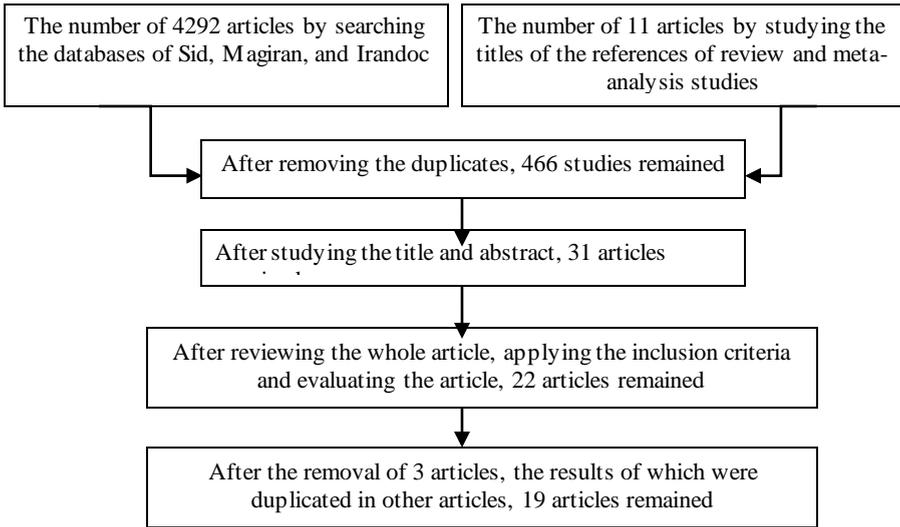


Chart 1: Flowchart of the inclusion of studies into the meta-analysis

After extracting the required information from the evaluated articles, the statistical analysis of the obtained data was carried out using STATA software (version 11). Pooled RD extracted from the results and Metan commands were used to analyze the data.

Results

In 19 articles that were studied, 837 participants (487 people in the experimental group and 350 people in the control group) were studied. The number of participants in the examined articles ranged from 16 to 112. Except one study in which all of the participants were female, all of the participants examined in other articles were male. The descriptive statistics of the articles are presented in Table 1.

Table 1: Descriptive Research Information of the Studied Articles (Mentioned in the Article)

<i>Author (research time)</i>	<i>Intervention pattern (independent variable)</i>	<i>Sample size</i>	<i>Statistical test</i>	<i>Sig.</i>
Jafari et al. (2016)	Coping skills training	39 people (13 experimental 1, 12 experimental 2, 14 control)	$X^2=7.34$	$P<0.01$
Yaqoubi et al. (2016)	Return preventing based on mindfulness	60 males	$X^2=0.007$	$P>0.05$
Dehnavi et al. (2015)	Psychodrama	20 males	$Z=2.25$	$P<0.01$
Farnam (2015)	Matrix model treatment	34 males (16 experimental and 18 control)	$X^2=10.34$	$P<0.01$
Marepour et al. (2014)	Relapse prevention treatment based on mindfulness	60 males	$X^2=4.821$	$P<0.05$
Khodadoust et al. (2014)	Marlatt's cognitive-behavioral Intervention	45 males (15 experimental 1 and 15 experimental 2)	$X^2=7.971$	$P<0.05$
Khodadoust et al. (2014)	Group therapy based on the stages of change			
Nomeini et al. (2014)	The integrated solution-based and structural intervention of family therapy	30 males	$X^2=20.00$	$P<0.001$
Farnam (2013)	Matrix model treatment	23 males (11 experimental and 12 control)	$X^2=3.90$	$P<0.05$
Hamedi et al. (2013)	Cognitive therapy based on mindfulness	84 males (28 experimental 1, 27 experimental 2, 29 control)	$X^2=7.61$	$P<0.01$
Hamedi et al. (2013)	Behavioral counseling and reducing substance use harms		$X^2=6.10$	$P<0.05$
Ghorbaniet al. (2012)	Cognitive-behavioral therapy	20 males	$Z = -1$	$P>0.05$
Amirabadi et al. (2012)	Cognitive-behavioral group therapy	112 males	$X^2=29.34$	$P<0.001$
Raeisian et al. (2011)	hope therapy program of Snyder et al.	20 female	$Z=2.25$	$P<0.01$
Kaldavi et al. (2011)	Relapse prevention therapy based on mindfulness	24 males	$X^2=6.17$	$P<0.05$
Kafi et al. (2011)	Group therapy of transactional analysis	16 males	not reported	
Karimian (2011)	Stress management based on cognitive-behavioral method	30 males	$X^2=1.53$	$P>0.05$
Mollazadeh (2009)	Cognitive-behavioral therapy based on Carroll's pattern	20 males	$X^2=6.40$	$P<0.05$
Jafari et al. (2009)	Coping skills training based on Marlatt's relapse prevention model	27 males (13 experimental, 14 control)	$X^2=6.68$	$P<0.01$
Goodarzi & Besharat (2009)	Group behavioral and conventional activation therapy	116 people (28 experimental 1, 30 experimental 2, 28 experimental 3, and 30 control)	$X^2=89.15$	$P<0.001$
Goodarzi & Besharat (2009)	Group behavioral and conventional activation therapy with family support training			
Goodarzi & Besharat (2009)	Cognitive-behavioral therapy			
Dabbaghi et al. (2008)	Cognitive behavioral therapy for relapse prevention	87 males (30 experimental 1, 30 experimental 2, and 27 control)	$X^2=10.95$	$P<0.01$
Dabaaqi et al. (2008)	Relapse prevention therapy based on mindfulness			

Chi-square test (X^2) was used to assess the heterogeneity of the results ($P > 0.05$, $df = 24$, $Q = 22.24$). Considering the significance level at the error level of 5%, it can be concluded that the results of the studies are not heterogeneous. The numerical value of the I^2 index, which is reported to be zero, also indicates the homogeneity of the results of the studies. Moreover, the τ^2 test confirms it. Based on this test, the variance between results of studies is less than 0.001. The estimation of confidence interval for relapse prevention is presented in Fig. 2.

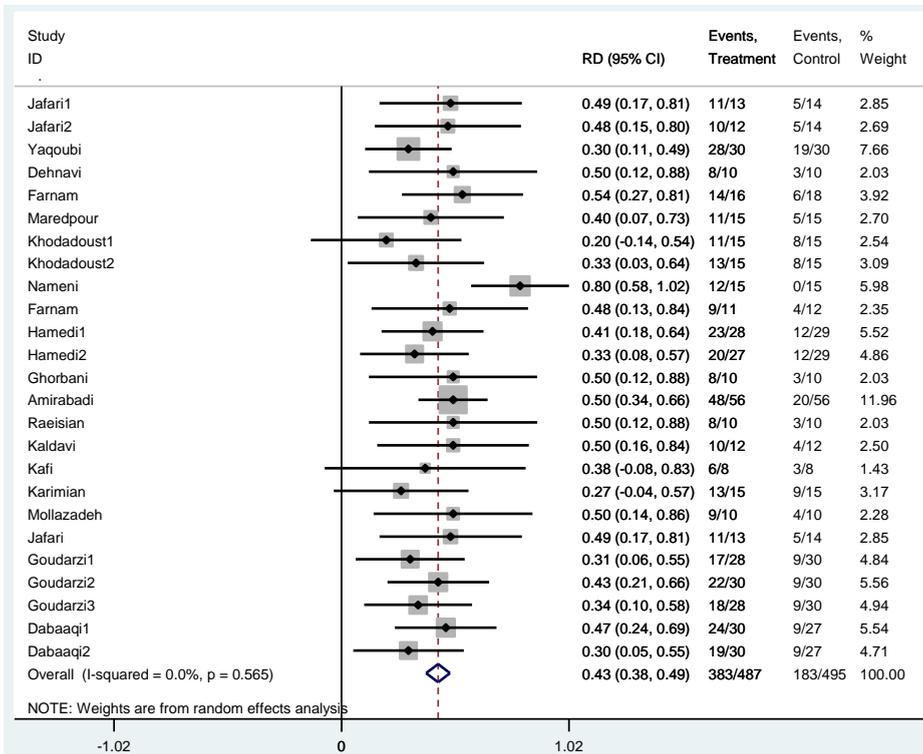


Figure 2: Estimation of the confidence interval for relapse prevention

The performed meta-analysis on the basis of risk difference indicates the significant effect of psychological therapies on reducing the rate of addiction relapse ($Z = 77.15$, $P < 0.001$). As illustrated in the forest plot, the risk difference is 0.43, indicating that the rate of relapse prevention in the experimental group (psychological therapies) is 43% higher. In other words, the rate of relapse in the experimental group was 43% lower than the control group.

Table 2: The Analysis of the Subgroups Entered into the Metaanalysis based on the Type of Treatment

<i>Therapy subgroups</i>	<i>Number of Trials</i>	<i>Effect size</i>	<i>I² in the subgroup</i>	<i>Sig. in the subgroup</i>	<i>I² %</i>	<i>Sig.</i>
Cognitive-behavioral	12	0.43 (0.35-0.50)	0.0 %	0.001		
Mindfulness	5	0.35 (0.24-0.47)	0.0 %	0.001		
Matrix therapy	7	0.52 (0.30-0.73)	0.0 %	0.001		
Psychodrama	1	0.50 (0.12-0.87)	-	-		
Therapy based on the stages of change	1	0.20 (0.13-0.53)	-	-	55.0%	0.001
Family therapy	1	0.80 (0.85-1.02)	-	-		
Hope therapy	1	0.50 (0.12-0.87)	-	-		
Transactional analysis	1	0.37 (-0.07-0.82)	-	-		

As shown in Table 2, in comparing the effects of different therapies on relapse prevention, different effect sizes have been reported. Although the highest effect size is reported for the family therapy, it should be noted that only one study about this type of therapy has been entered into the meta-analysis; with regard to the low number of studies conducted in some of the therapy subgroups, the differences between the therapeutic methods cannot be analyzed based on the obtained effects sizes.

Discussion and Conclusion

The aim of this study was to determine the effectiveness of psychological therapies on the relapse prevention of drug use in addicts by meta-analysis method. In this way, besides combining the findings of the existing studies, making more precise conclusions will be possible in this area of research. The results indicate the significant effect of psychological therapies on reducing the addiction relapse. In this regard, it is consistent with the findings of other researchers (Prendergast et al., 2002; Gilford et al., 2004; Dutra et al., 2008; Katz, & Toner, 2013). Dutra et al. (2008) conducted a review study on 34 experimental controlled studies (consisting of 2340 patients) to examine the effectiveness of the psychological-social therapies on the use of illegal drugs. Generally, the moderate effect size of 0.45 was obtained ($d = 0.45$), while the highest effectiveness was obtained for cannabis abuse ($d = 0.81$), moderate efficacy was obtained for cocaine abuse ($d = 0.62$), and the lowest efficacy was observed for multiple drug use ($d = 0.24$). This suggests that the more severe the substance abuse disorder is, the more difficult the treatment will be. The high rate of drop off and the abandonment of treatment (42%) in the experimental groups using cocaine were not commensurate with its acceptable rate of effect size (0.62). The greatest effectiveness was observed in the dependency management therapy (14 studies) ($d = 0.58$). The number of 13 studies were about the cognitive-behavioral therapy that showed a low effect size ($d = 0.28$). The mean of treatment duration was 21 weeks.

Coping skills, usually taught in cognitive-behavioral therapies, teach patients how to refrain from using drugs. Each session of cognitive-behavioral therapy includes an explanation of the logic of treatment, instruction of skills, and role play with feedback and reinforcement. The skills of refusing to consume, encouragement, effective criticism, being open to criticism, listening skills, conversational skills, and problem or conflict solving skills are among the most important topics discussed in the sessions (Kamarzarrin, Khaledian, Shooshtari, & Ahmadimehr, 2013).

Mindfulness exercises (for example, mindful breathing) are accompanied by better physical and mental health outcomes (Rayan, & Ahmad, 2016). Mindfulness tasks reinforce the attention to the present time, which, in turn, interrupts the cycles of thought that are along with the search for substance and thus replaces them with a creative coping strategy; In general, these issues can lead to the management of addictive behaviors (Garland, Froeliger, & Howard, 2013).

Currently, there has been an increasing interest in the study of the effectiveness of various types of psychological interventions in substance abuse and relapse in the world and Iran and various studies have been done in this field. Various systematic review studies have also been conducted in the world with supporting the effectiveness of psychological interventions in helping addicts (Katz & toner, 2013). However, the literature review suggests that these studies have focused on specific and limited variables and that the complexities associated with psychosocial-social therapies of addiction have not been carefully examines, largely due to the scarcity of the underlying studies. Since the number of studies indicating the effectiveness of psychological therapies in substance abuse is increasing day by day, the need for complementary studies and the combining the findings of these studies is felt. The current study was conducted to meet this need. However, further research is needed on the extent and continuation of the effects of psychological therapies on the other consequences of drug abuse in Iran. Meanwhile, the need for studies on the effectiveness of psychological therapies on substance abuse with an emphasis on the role of gender in early studies and, moreover, in systematic and meta-analytic studies, is felt. Therefore, the researchers must address this issue.

The present study, with regard to the employed research method, has certain limitations, and the most important ones are mentioned here. Considering that the search stage in this study was conducted only in Persian databases, the language bias is one of the limitations of the present study. Furthermore, most of the studies included in the study did not report the relevant descriptive and demographic information including age, sex, education level, etc. Therefore, a deeper study and the discovery of the relationship between the types of therapeutic interventions and their effectiveness with the characteristics of the participants were not possible.

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