

Investigating the effect of ACT training on self-efficacy and impulse control of addicts

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ABSTRACT

The present study aimed at investigating the effect of group acceptance and commitment therapy training on self-efficacy and impulsivity control of addicts in addiction treatment centers of Gorgan. The present study was a quasi-experimental study with a pretest-posttest design and a control group. The statistical population of the study consisted of women with drug abuse who were living in the Aftab-e Zendegi Women's Addiction Treatment Camp in Gorgan in the second half of 2019. Based on a preliminary interview, 30 addicted women were selected through a convenience sampling method and were randomly assigned to two experimental and control groups (15 people in each group). Subjects in both groups were assessed in the pretest and posttest stages by Barratt (1950) impulsivity scale and the Sherer et al (1982) self-efficacy questionnaire. Acceptance and commitment training was presented in 8 weekly sessions of two hours to the subjects in the experimental group, while the subjects in the control group did not receive any intervention until the end of the post-test stage. Data were analyzed through ANCOVA and MANCOVA tests in SPSS version 24 software. The results revealed that acceptance and commitment therapy training reduced impulsivity and its components (cognitive impulsivity, non-motor impulsivity, non-planning impulsivity) in subjects of the intervention group. Also, educational intervention significantly increased the self-efficacy of the subjects in the experimental group ($p < 0.01$). Based on results of the study, acceptance and commitment therapy training can be used as an effective non-pharmacological solution to reduce impulsivity and increase self-efficacy in women with drug abuse.

Keywords: Addiction, Impulsivity, Self-Efficacy, Acceptance and Commitment Therapy, Women.

Introduction

Drug addiction has been defined in the last two decades as a chronic and recurrent brain disorder characterized by compulsive searching and using drug ^[1]. In other words, drug addiction is defined based on drug-related behaviors that also include one's cognitions, emotions, and other experiences ^[2]. The drug crisis has attracted much attention in the world among the health and self-care areas ^[3]. According to the latest report released by the United Nations Office on Drugs and Crime, the

number of drug users is estimated at 255 million people with an age range of 15 to 64 years. Also, based on the report of Center of Studies to Measure Disease Tolerance in 2015, about 17 million years of healthy life of drug users were lost due to physical and mental disorders ^[4]. Drug addiction, in addition to increasing the risk of physical and mental diseases ^[5] and psychological ^[6], imposes many harms to affected people, healthcare system, and communities ^[7, 8]. Despite extensive harms of drug use, investigating the underlying mechanisms of chronic drug use is an informative resource that can transform appropriate intervention strategies. Studies conducted on etiology of drug abuse has referred to factors such as personality and its key role in interacting with other environmental factors in initiating and continuing drug use ^[9]. Some studies have also referred to behavioral and personality traits as possible barriers to drug treatment failure in drug users ^[10, 11].

Impulsivity is one of the most important personality traits associated with drug abuse. Nowadays, impulsivity is

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conceptualized as a cognitive dimension and is considered as one of the characteristics of addiction ^[11]. In other words, impulsivity is associated with a lack of cognitive inhibition and risky decision-making ^[12]. Impulsivity has been defined as a range of behavioral and cognitive tendencies, such as difficulty in delaying or inhibiting voluntary response, short response threshold, defect in delaying pleasure, and difficulty in paying attention ^[13]. Barratt, Stanford, Kent & Felthous (1995) distinguished three components of impulsivity: cognitive impulsivity (the ability to focus on close work and cognitive instability), motor impulsivity (acting without a prior plan with stubbornness), and non-planning impulsivity (Inability to plan and think carefully) ^[14].

Heinz, Bui, Thomas & Blonigen (2015) introduced four dimensions of personality in relation to the different dimensions of impulsive behaviors: 1) Lack of planning: the tendency to engage in urgent actions rather than to act with careful thought and planning. 2) Urgency: the difficulty in resisting strong impulses and a tendency to act out of indiscretion when experiencing positive or negative emotions. 3) Sensation-seeking: the tendency to search for adventure and excitement 4) Lack of stability: the difficulty in maintaining attention on task performance and failure in tolerance of boredom. Investigations suggest that impulsivity is not a single personality dimension, but is composed of multidimensional structures ^[15, 16]. In their research on impulsivity and addiction, Verdejo -Garcia, Lawrence & Clark (2008) ^[17] referred to the following two results: 1- There is a significant correlation between the high age of impulsivity and the neuro-cognitive characteristics of impulsivity among different groups of drug users; 2. Impulsivity in drug users may be affected by drug abuse. The relationship between impulsivity and drug abuse has been extensively studied and its role in formation and continuity of problem-solving and recurrence behaviors has been emphasized ^[11].

A study conducted by Krishnan-Sarin et al. (2007) showed that the higher the impulsivity in individuals, the lower the likelihood of behavioral inhibition, and consequently, the greater the likelihood of recurrence ^[18]. Lopez-Torrecillas, Perales, Nieto-Ruiz & Verdejo-Garcia (2014) showed that impulsivity has the potential to predict recovery or recurrence after treatment ^[19]. Studies conducted by using the five-factor model of impulsivity also indicate the relationship between the dimensions of impulsivity and various variables and drug use, alcohol consumption and tobacco use ^[20], alcohol over-consumption ^[21], daily alcohol consumption ^[22], smoking ^[23], abuse of opioids ^[24], marijuana use and its negative consequences ^[25], consequences of drug use in adolescents ^[26] and the results of addiction treatment ^[27]. Self-efficacy is another concept that should be considered in patients with drug abuse. Bandura (1986) was the first person who paid attention to the concept of self-efficacy. Bandura stated that people views on causes and consequences are formed based on their experiences. He argued that people develop certain beliefs about the ability to cope with certain situations. The core of Bandura's social cognitive theory is based on the principle that

one's expectations of his or her abilities are formed by self-efficacy beliefs about work, interests, goals, and actions ^[28]. The concept of self-efficacy is related to one's beliefs about his or her ability to do things effectively, and is influenced by a variety of factors, including one's successes and failures, observing successes or failures of those who are similar to him or her, and verbal persuasion ^[29]. High self-efficacy is essential for social development and makes one's life enjoyable and enables him or her to cope with long-term stress ^[30, 31].

Lev & Koslowsky (2009) stated that high self-efficacy is associated with accepting challenging goals and high performance ^[32]. Silva & Vijayalaxmi (2013) reported in their study that addicts have significantly lower self-efficacy, problem-solving ability, critical thinking, and creative thinking compared to non-addicts ^[33]. The results of a study conducted by Naar-King et al. (2006) on 64 young people aged 16 to 25 showed that addicts' self-efficacy could predict 47% of variance in alcohol consumption and 69% in marijuana use ^[34]. One of the therapeutic approaches that can be effective in reducing the psychological problems caused by drug abuse is acceptance and commitment therapy. Acceptance and commitment therapy was developed by Hayes in 1986. This method is part of the third wave of behavioral therapies and emerged following the second wave of these therapies such as cognitive-behavioral therapy (Hayes et al., 2006; quoted by Morshedi, Davarnia, Zahrakar, Mahmoudi and Shakermi, 2015) ^[35]. The approach of this treatment to cognition is based on behavioral theories about language and cognition, which is called Relational Frame Theory (RFT) ^[36]. According to Relational Frame Theory (RFT), human does not respond to them only on the basis of his or her previous interactions with stimuli (which is emphasized by behaviorism), but his or her response to stimuli depends on interactions of these stimuli and other events ^[37]. The base of the acceptance and commitment approach is that major parts of psychological problem stem from empirical avoidance, that is, one's tendency to avoid unwanted private experiences such as thoughts, desires, or emotions, to try to control them, or to escape them, so it targets the empirical avoidance so that the person gains psychological flexibility ^[38]. Acceptance and commitment therapy includes six central processes that lead to psychological flexibility. They include defusion, acceptance, contact with the present moment, observing self, values, and committed action ^[39].

This treatment has six basic principles. Defusion is to prevent cognitive fusion. Cognitive fusion means that one considers he or she and his or her thoughts are fused. Cognitive defusion means that we accept that our thoughts are separate from ours and are nothing more than temporary private events. Acceptance means creating a space for feelings, senses, desires, and other unpleasant private experiences without trying to change them, escape from them, or pay attention to them again. Contact with the present moment is a complete awareness of the here and now experience with openness, interest, acceptance, focus on it and full engagement with what is going on. Observing self is a constant awareness of oneself, which

does not change and is always present and resistant to harm. From this perspective, the experience of thoughts, feelings, memories, desires, senses, images, roles, or even the physical body is something different from the person himself or herself. These phenomena change, but the person himself or herself is constantly constant. Values and committed actions mean that one recognizes what is most important and deepest for him or her, sets goals based on it, and acts committedly and effectively to achieve them ^[40]. Acceptance and commitment therapy model, whether used in treatment clinics or at work, leads to significant behavioral changes and it focuses on improving psychological flexibility. Cognitive flexibility means being able to make contact with the present moment and being aware of thoughts and emotions (without trying to change or control those private experiences), and depending on the conditions, continuing or changing behavior in line with personal values and goals ^[41, 42].

In this therapy, the client is taught that any action to avoid or control unwanted mental experiences (thoughts and feelings) is ineffective or has the opposite effect and exacerbates them, and these experiences should be accepted without any internal and external reaction to eliminate them ^[43]. Since the prevalence of drug addiction is very widespread in many countries, including Iran, and annually a large number of people, especially young people, are affected by it and due to its destructive effects on body and psych of addicts, and since many addicts face serious physical and psychological problems, it is important to investigate the adverse psychological consequences of this problem and use effective non-pharmacological treatment strategies in addition to pharmacological treatments. to prevent the development and spread of this phenomenon. Also, various studies have examined and confirmed the effectiveness of acceptance and commitment therapy in different individuals and target communities. Since the need for psychological interventions to reduce impulsivity and increase the self-efficacy of patients with drug abuse is felt more than ever, researcher of the present study seeks to answer the following question: Is group-based acceptance and commitment training effective in self-efficacy and controlling the impulsivity of addicts in addiction treatment centers of Gorgan city?

Methodology

The present study was an applied research in terms of type and quasi-experimental with a pre-test-post-test design and a control group in terms of method. In this therapeutic intervention technique, acceptance and commitment therapy was considered as independent variable and impulsivity control and self-efficacy were considered as dependent variables.

Statistical population, sample and sampling method

The statistical population of present study consisted of all women with drug abuse who were living in the Aftab-e Zendegi Women's Addiction Treatment Camp in Gorgan in the second

half of 2019. The sample consisted of 30 addicted women and applicants for treatment sessions. After a preliminary interview and based on the inclusion and exclusion criteria of the research, they were selected through a convenience sampling method and were randomly assigned to the experimental and control groups (each group included 15 subjects). Concerning the sample selection, it should be noted that each subgroup must have at least 15 people in experimental projects ^[44]. Inclusion criteria of the study included female gender, minimum age of 18 and maximum age of 50 years, diagnosis of drug dependence by a psychologist, physician and psychiatrist in the camp, staying in the camp for at least one month, not suffering from mental disorders such as Schizophrenia, obsessive-compulsive disorder, and written consent and willingness to participate in therapy sessions. Simultaneous participation in other treatment programs and being absent in more than two sessions were also considered as exclusion criteria of this study.

Research instruments

In this study, the following instruments were used to collect data:

1-Barratt Impulsivity Scale: The original version of this test was developed by Ernest Barratt in 1950 and has been revised many times. This questionnaire is well correlated with the Eysenck Impulsivity Questionnaire. The scale has 30 questions scored on a four-point Likert scale to assess the multidimensional nature of impulsivity. In addition to the general impulsivity scale, this questionnaire has three subscales: a) cognitive impulsivity (rapid cognitive decision making), b) motor impulsivity (acting without thinking), and c) non-planning impulsivity (inability in planning and thinking accurately). In addition to the score of each individual subscale, a total score is calculated for the whole impulsivity scale. To prevent people from creating an answer style, a number of questions are written in such a way that they indicate a lack of impulsivity and are scored reversely.

Scores between 52 and 71 indicate normal level for impulsivity, scores above 71 indicates high level of impulsivity, and scores below 52 indicate low level of impulsivity ^[45]. Patton, Stanford & Barratt (1995) reported internal consistency coefficients for the overall score of scale at the range of 0.78-0.83 in separate populations of graduates, drug abuse patients, psychiatrists, and prisoners. The validity of Persian version of the questionnaire was examined by Ekhtiari et al. (2008) and the correlation of the subscales of non-planning impulsivity, motor impulsivity, and cognitive impulsivity was reported to be 0.80, 0.91 and 0.81, respectively ^[46]. In a study conducted by Borna, Hamid and Hayati (2016), reliability of this scale through Cronbach's alpha method was obtained at 0.79. In a study conducted by Yarian, Asgharnejad Farid and Karandish (2018), the Cronbach's alpha of reliability of general impulsivity was obtained at 0.81 and it was obtained at 0.76, 0.85, and 0.80, respectively, for the subscales of cognitive impulsivity, motor impulsivity, and non-planning impulsivity.

2-Self-efficacy questionnaire: This questionnaire was developed in 1982 by Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs & Rogers. This scale has 17 questions, scored on a five-point Likert scale ranging from 1 strongly disagree to 1 strongly agree.

Its items assess factors such as not giving up against the problems, being able to cope with problems, being able to achieve goals, and stability in doing things. This scale is scored in such a way that score 1 to 5 is given to each item. Questions 2, 4, 5, 7, 11, 12, 14 and 16 are scored reversely. The minimum score of the subject in this scale is 17 and the maximum score is 85 ^[47]. Sherer et al. (1982) reported its Cronbach's alpha at 0.86. Maddux and Rogers (1986) reported reliability of this questionnaire at 0.89 and 0.93, respectively, using split-half and Cronbach's alpha methods. Barati (1997; quoted in Mobasem, 2007) obtained the reliability of the self-efficacy scale at 0.76 using Spearman-Brown method and at 0.76 using split-half method. In the research conducted by Eyri, Fakhri and Hassanzadeh (2018), the validity and reliability of this questionnaire were obtained at 0.77 and 0.84, respectively.

Research implementation method

The implementation method of this research was as follows: First, a letter of introduction was received from the relevant faculty to be submitted to the Deputy of Prevention of Gorgan Welfare Department. After the approval of the relevant deputy, the researcher attended the Aftab-e Zendegi Women's Addiction Treatment Camp and explained the necessity of conducting the study, the implementation process and the benefits of the interventions that will be provided to addicted women. After obtaining the consent of the camp officials, among the women applicants for participation in the treatment sessions, 30 people were selected based on the inclusion and exclusion criteria and using a convenience sampling method and

they were randomly assigned to experimental and control groups (each group included 15 subjects). After randomly replacing the subjects in the experimental and control groups and taking a pre-test from both groups, acceptance and commitment therapy training was held in 8 sessions of 2 hours in group and weekly for the experimental group subjects. The subjects of control group did not receive any intervention during the presentation of training package to subjects of the experimental group and were placed on the waiting list for further training. At the end of the treatment sessions, both groups responded to the research questionnaires (post-test). Since it is very important to observe ethical considerations in any research, the following cases were considered in the present study: 1- The researcher introduced himself to the research subjects and explained about the research objectives 2- subjects were ensured on the confidentiality of personal information 3- Beliefs, culture, religion, etc. of the subjects were respected 4- The research subjects had full freedom to participate in the study 5- privacy of the subjects was maintained and they were ensured that intervention had no risk for them 6- scientific accuracy and trustworthiness were considered in recording the information and statistics obtained from the research at the time of collecting and analyzing the information and using the references. Also, to observe the ethical and professional issues in the research and appreciate subjects of control group for their cooperation in the research, after the end of the treatment sessions were held for control group subjects after the post-test stage. The content of acceptance and commitment therapy sessions was designed based on the book entitled "Theoretical Foundations and Practical Guide to Acceptance and Commitment Therapy by Hayes, Strauss and Wilson" (2016) that was translated by Zare et al. (2017) ^[48]. The method of implementing treatment sessions is briefly presented in Table (1).

Table 1- summarizes the content of treatment sessions based on acceptance and commitment

session	goals	content of sessions
1	Familiarity with the rules of the ACT method	Performing pre-tests, familiarizing members with each other and therapist, describing group rules, group goals and structure, therapeutic commitments, introductory speeches about ACT
2	Familiarity with some of the concepts of ACT therapy, including the experience of avoidance, fusion, and psychological acceptance.	Assessing clients' problems from an ACT perspective, extracting the individual's experience of avoidance, fusion, and values. Preparing a list of the advantages, disadvantages, and ways to control problems
3	Implementing techniques of ACT therapies such as cognitive segregation, psychological awareness, self-visualization	Assessing tasks, correcting inefficiencies, controlling negative events using metaphors, cognitive segregation training, psychological awareness, and self-visualization
4	Training therapeutic techniques, emotional awareness, intelligent awareness (self-sacrifice metaphor)	Assessing tasks, separating assessments from personal experiences, and taking a position to observe non-judgmental thoughts in a way that leads to psychological flexibility and positive emotions.
5	Training therapeutic techniques as a background and practicing mindfulness techniques and boredom tolerance training	assessing of tasks, contacting with the present time, and training mindfulness techniques and boredom tolerance to accept negative emotions.
6	Training therapeutic techniques of personal values and enlightening values and training emotion regulation (bad cup metaphor)	assessing of tasks, identify clients' life values, and measuring values based on their importance. Preparing a list of barriers to achieve values and creating positive emotions

7	Training therapeutic techniques of personal values and committed action and increasing interpersonal efficiency (chessboard metaphor)	Assessing of tasks, providing practical solutions to remove barriers while using metaphors and planning for commitment to pursue values and creating a sense of meaning in life
8	Reviewing and practicing therapeutic techniques are taught with an emphasis on emotion regulation and a sense of meaning in real life	Assessing of tasks, reporting on the steps to follow values, asking clients to explain the results of sessions, and performing techniques learned in the real world of life to create a sense of meaning and creating positive emotions, performing post-test.

Statistical analysis methods

To analyze the data, descriptive indices of mean, standard deviation, graph and tables (at the statistical level) and ANCOVA and MANCOVA (at the inferential level) in SPSS version 24 software were used.

Data analysis

Main Hypothesis: Group-based acceptance and commitment therapy is effective in self-efficacy and impulsivity of addicts in addiction treatment centers of Gorgan city. To test this hypothesis, multivariate analysis of covariance test was used. Initially, the results of assumption of homogeneity of covariance matrices are presented.

Assumption of homogeneity of covariance matrices: The main hypothesis of the multivariate analysis of covariance is that the dependent variable vector follows a multivariate normal distribution and the variance-covariance matrices are equal in cells formed based on the effects between the subjects. To test this assumption, the Box's M test was used, the results of which are reported in Table (2).

Table 2- Box's M test results: homogeneity of covariance matrices

Box's M	F	Df1	Df2	significance level
5.08	1.56	3	141120	0.196

According to the values shown in Table (2) and since Box's M test not significant ($F = 1.56$ and $P > 0.05$), it can be concluded that the observed covariance matrices of variables are equal among different groups. Therefore, the assumption of homogeneity of the variance-covariance matrices was confirmed.

Table 3- Results of four tests to analyze multivariate covariance analysis

test	value	F	hypothesis df	df error	significance level
Pillai's Trace	0.946	220.02	2	25	0.001
Wilks Lambda	0.054	220.02	2	25	0.001
Hotelling's Trace	17.60	220.02	2	25	0.001

According to the Table 3 information, the values of Pillai's Trace (0.946), Wilks Lambda (0.054), Hotelling's Trace (17.60) and Roy's Largest Root (17.60) tests are significant ($p < 0.01$). The significance of these tests shows that in at least one of the variables of self-efficacy and impulsivity, there is a difference between the mean scores of the post-test scores of

the experimental and control groups. Investigation of these differences is presented in Table (4).

Table 4- Results of multivariate analysis of covariance of the effect of teaching on the scores of research variables

variable	sum of squares	df	mean of squares	F	significance level	effect size
self-efficacy	51.899	1	51.899	39.33	001.0	56.0
impulsivity	36.1672	1	36.1672	28.45	001.0	63.0

As shown in Table (4), the results of multivariate analysis of covariance show a significant difference between the experimental and control groups in the self-efficacy variable ($F = 33.39$ and $p < 0.01$). Based on the mean values of this variable for the experimental group in the pre-test (32.40) and post-test (43.53) stages, it can be seen that group-based acceptance and commitment therapy increased the mean scores of the subjects in the post-test stage. The effect size value in the table shows the effect of training, according to which the effect of training on self-efficacy is 56%. With regard to impulsivity variable, it is observed results of multivariate analysis of covariance show a significant difference between the experimental and control groups ($F = 45.28$ and $p < 0.01$). Given the mean values of this variable for the experimental group in the pre-test (82.20) and post-test (64/80) stages, it can be stated that training has reduced the mean scores of the subjects in the post-test stage. The effect of training on impulsivity was 63%.

Based on these results, the main research hypothesis that states "group-based acceptance and commitment therapy affects the self-efficacy and impulsivity of addicts in addiction treatment centers of Gorgan city" is confirmed.

Sub-hypothesis 1: Group-based acceptance and commitment therapy training is effective in self-efficacy of addicts in addiction treatment centers of Gorgan city.

Table 5: Results of ANCOVA analysis of the effect of training on self-efficacy scores

source of variations	sum of squares	df	mean of squares	F	significance level	effect size
pre-test effect	414.60	1	414.60	15.94	0.001	-
post-test effect	901.71	1	901.71	34.67	0.001	0.56
error	702.05	27	26.002			
sum	45616	30				

As shown in Table (5), the results of ANCOVA show a significant difference between the experimental and control groups in the self-efficacy variable ($F = 34.67$ and $P < 0.01$).

Given the mean values of this variable for the experimental group in the pre-test (32.40) and post-test (43.53) stages, it is observed that the implementation of group-based acceptance and commitment therapy increases the mean scores of the subjects in post-test stage. Based on the value of the effect size column in the table above, the effect of training on self-efficacy was 56%. Based on these results, the first sub-hypothesis of the study, which states that "group-based acceptance and commitment therapy is effective in self-efficacy of addicts in addiction treatment centers Gorgan city " is confirmed.

Sub-hypothesis 2: group-based acceptance and commitment therapy is effective in components of impulsivity (cognitive impulsivity, motor impulsivity, non-planning impulsivity) of addicts in addiction treatment centers of Gorgan city. To test this hypothesis, a multivariate analysis of covariance was used. Initially, the assumption of homogeneity of the covariance matrices results are presented. To test this assumption, the Box's M test was used and its results are reported in Table (6).

Table 6- Box' M test results: homogeneity of covariance matrices

Box's M	F	Df1	Df2	significance level
1.92	1.49	3	5680.30	0.803

According to the values shown in Table (6) and since Box' M test is not significant (F = 1.49 and p >0.05), it can be concluded that the observed covariance matrices of dependent variables are equal among different groups. Therefore, the assumption of homogeneity of the variance-covariance matrix was confirmed.

Table 7- Results of four tests of multivariate analysis of covariance

test	value	F	hypothesis df	df error	significance level
Pillai's Trace	0.731	20.81	3	23	0.001
Wilks Lambda	0.269	20.81	3	23	0.001
Hotelling's Trace	2.71	20.81	3	23	0.001
Roy's Largest Root	2.71	20.81	3	23	0.001

According to the Table 7 information, the values of Pillai's Trace (0.731), Wilks Lambda (0.269), Hotelling's Trace (2.71) and Roy's Largest Root (2.71) tests are significant (p<0.01). The significance of these tests shows that in at least one of the components of impulsivity, there is a difference between the mean scores of the post-test scores of the experimental and control groups. Investigation of these differences is presented in Table (7).

Table 8- Results of multivariate analysis of covariance of the effect of training on the scores of impulsivity components

variable	sum of squares	df	mean of squares	F	significance level	effect size
cognitive impulsivity	144.37	1	144.37	16.30	0.001	0.39
non-motor impulsivity	71.91	1	71.91	37.22	0.001	0.59
non-planning impulsivity	408.26	1	408.26	17.94	0.001	0.41

As shown in Table (8), the results of multivariate analysis of covariance show a significant difference between the experimental and control groups in the component of cognitive impulsivity (F = 30.16 and p <0.01). According to The mean values of this variable for the experimental group in the pre-test (23.13) and post-test (19.27) stages, it is observed that group-based acceptance and commitment therapy has reduced the mean scores of the subjects in the post-test stage. The impact of training on cognitive impulsivity was 39%. For the non-motor impulsivity, the results of multivariate analysis of covariance show a significant difference between the experimental and control groups (F=37.22 and p<0.01). According to the mean values of this component for the experimental group in the pre-test (28.33) and post-test (24.13) stages, it is observed that providing training has reduced the mean scores of the subjects in the post-test stage. The level of effect of training on non-motor impulsivity was 59%. For non-planning impulsivity component, according to the information of Table (4-16), the results of multivariate analysis of covariance show a significant difference between the experimental and control groups (F = 17.94 and p <0.01). According to mean values of this component for the experimental group in the pre-test (30.73) and post-test (21.40) stages, it is observed that providing training has reduced the mean scores of the subjects in the post-test stage. The effect of training on non-planning impulsivity was 41%. According to these results, the second sub-hypothesis of the study that states "group-based acceptance and commitment therapy training is effective in components of impulsivity (cognitive impulsivity, non-motor impulsivity, non-planning impulsivity) of addicts in addiction treatment centers of Gorgan city", is confirmed

Conclusion

Main Hypothesis: Group-based acceptance and commitment therapy training is effective in self-efficacy and impulsivity of addicts of addiction treatment centers of Gorgan city.

According to the information in Tables (4-11) and (4-12), the results of multivariate analysis of covariance showed that group-based acceptance and commitment therapy training significantly reduced impulsivity and increased self-efficacy of addicted women in the experimental group. The results of test this hypothesis are consistent with the results of some previous studies. McClure, Bricker, Moll, and Heffner (2020) compared the effectiveness of group-based acceptance and commitment therapy and cognitive-behavioral therapy for smoking cessation in the form a randomized controlled trial ^[49]. The 30-day avoidance rate during the 12-month follow-up period did not show a difference between the two study groups in the initial analysis or in the sensitivity analysis. In this randomized trial, group-based acceptance and commitment therapy and cognitive-behavioral did not differ in terms of long-term smoking cessation rate. However, group-based acceptance and commitment therapy was a reasonable alternative for cognitive-behavioral group therapy for smoking cessation. Meyer et al.

(2018) investigated the effectiveness of group-based acceptance and commitment in post-traumatic stress disorder along with alcohol consumption disorders in 43 veterans ^[50]. According to the results, the symptoms of post-traumatic stress disorder decreased after treatment.

Self-reported symptoms of post-traumatic stress disorder decreased during the three-month follow-up period. After treatment and during the three-month follow-up period, in all results related to alcohol, depression and suicidal ideation decreased, and a significant increase in quality of life was observed. In randomized pilot study conducted by Dindo et al (2018), the effect of acceptance and commitment therapy in preventing chronic postoperative pain and drug use in high-risk veterans was examined ^[51]. The results showed that subjects in the group-based acceptance and commitment group were more likely to experience pain relief and discontinuation than those who were in the normal treatment group. In the study conducted by Hasani, Hasani and Niaei (2017), the effectiveness of group-based acceptance and commitment therapy in impulsivity of patients with depression was examined ^[52]. The results showed the effectiveness of group-based acceptance and commitment therapy in reducing impulsivity and its components, including attention/ motor and non-planning in both groups of patients with type 1 bipolar disorder and major depressive disorder.

Morrison (2016) examined the effectiveness of acceptance and commitment therapy in impulsive decision-making. The results showed that this therapy increased productivity, flexibility to emotions, thoughts and physical states, and acceptance and commitment therapy was a useful therapy to help people change their behavior and can increase their quality of life. Gonzalez-Mendes-Fernandez et al (2014) conducted a study entitled "Long-term results of acceptance and commitment therapy in female drug addicts: a randomized controlled trial" ^[53]. The aim of the study was to compare the long-term effectiveness of acceptance and commitment with cognitive-behavioral therapy in drug abuse treatment. Analyses of the mixed linear model showed a decrease in drug abuse, a decrease in anxiety sensitivity index, and an increase in avoidance in both groups, although no difference was observed between the two groups. However, the rate of mental disorders decreased only in the group received acceptance and commitment therapy. In the 18-month follow-up, acceptance and commitment therapy performed better in maintaining avoidance and cessation rates. In the study conducted by Basiramir, Ghamari and Kiani (2019), the effectiveness of acceptance and commitment therapy in neutral belonging and perception of overhead without addicts was examined ^[54].

The results showed that acceptance and commitment therapy had an effect on neutral belonging and perception of overhead without addicts. In another study conducted by Hemmat et al. (2016) ^[55] under the title of "Effectiveness of group-based acceptance and commitment therapy in reducing craving for consumption and increasing the quality of life of addicts under methadone therapy", the results revealed that the group-based

acceptance and commitment therapy was effective in reducing craving for consumption and increasing mental health. The results of the present study are also consistent with those of the studies conducted by Svanberg, Munck and Levander (2017) ^[56], Kelly et al. (2015) ^[57], Tekiso et al. (2015), Lee, Ann, Levine and Twhig (2015) ^[58], Luoma et al. (2012) ^[59], Arjomand Ghajour et al. (2019), Mahmoudi and Ghaderi (2017) ^[60], Hashemi and Nazemi (2017) ^[61], Saeed Manesh and Pahlavan (2017) ^[62] and Mohammadi et al. (2015) ^[63] based on the effectiveness of the acceptance and commitment therapy in improving the different indicators of mental health in addicts. The effectiveness of acceptance and commitment therapy training in reducing impulsivity and increasing self-efficacy can be explained by the processes that govern it. One of the most important techniques in this approach is to define values and committed action. Encouraging clients to identify their values and setting goals, actions and barriers, and ultimately committing to achieving goals to achieve goals and move in line with the values despite the problems make them achieve their goals and happiness, leading to life satisfaction and being saved from negative thoughts and feelings such as anxiety, stress, despair, hopelessness, and depression, which in turn increase the severity of problems and impulsivity (Hayes and Strossal; translated by Alizadeh Mousavi and Pirjavid, 2015) ^[64].

In acceptance and commitment therapy, the goal is to strengthen the processes of acceptance, cognitive defusion, contact with the present time, specifying of values, and participation in valuable activities, all of which support psychological flexibility. In fact, when a person is severely trapped in the cycle of experiential avoidance and cognitive fusion, he or she suffers from psychological inflexibility. Mental flexibility can save a person from being trapped in dysfunctional thoughts and temptations that lead to impulsivity and a tendency to use drugs. Thus, teaching strategies such as mindfulness can save these people from being trapped from dysfunctional thoughts and temptations, and subsequently, dependent people can better cope with daily stress and problems with impulsivity and tendency to use drug ^[65]. The mindfulness strategy, which is emphasized in acceptance and commitment therapy, is based on the conscious-based and judgment-free assumptions of what is currently happening. Since a part of the problem with drug use lies in these factors, raising awareness in patients will be an important step in reducing impulsivity and increasing self-efficacy, so that increasing attention and awareness of thoughts, emotions and practical tendencies are positive aspects of mindfulness and harmonize adaptive behaviors and positive psychological states that ultimately reduce impulsivity and improve self-efficacy.

Sub-hypothesis 1: Group-based acceptance and commitment therapy is effective in the self-efficacy of addicts referred to addiction treatment centers in Gorgan city.

According to the information in Table (4-13), the results of the univariate analysis of covariance showed that acceptance and commitment training significantly increased the self-efficacy of the subjects in the experimental group. The results of testing

this hypothesis are in line with the results of some previous studies as follows: Meyer et al. (2018) examined the effectiveness of acceptance and commitment therapy in post-traumatic stress disorder along with alcohol consumption disorders in 43 veterans. Based on the results, the symptoms of post-traumatic stress disorder decreased after treatment. Self-reported symptoms of post-traumatic stress disorder decreased during the three-month follow-up period. After treatment and during the three-month follow-up period, in all results related to alcohol, depression, and suicidal ideation decreased, and a significant increase in quality of life was observed. In a randomized pilot study in 2018, Dindo et al. (2018) examined the effect of acceptance and commitment therapy in preventing chronic postoperative pain and drug use in high-risk veterans.

The results showed that subjects in the acceptance and commitment therapy were more likely to experience pain relief and drug discontinuation than those who were in the normal treatment group. In a pilot study, Svanberg, Munck and Levander (2017) used acceptance and commitment therapy for hospitalized clients due to severe substance use disorder. Positive changes were observed in psychological flexibility and in 9 executive functions out of 10 functions such as inhibitory control, task monitoring, and emotional control. In a study conducted by Lanza, Garcia, Lamelas and Gonzalez-Menendez (2014), the effectiveness of acceptance and commitment therapy was compared with that of cognitive-behavioral therapy in women prisoners using drugs. The results showed that although in the post-test stage, cognitive behavioral therapy was more effective than acceptance and commitment therapy, but in the follow-up stage, the results showed a higher effect of acceptance and commitment therapy in reducing drug abuse and increasing mental health compared to behavioral-cognitive therapy. In their study, Villagr a Lanza and Gonz alez Men endez (2013) investigated the impact of acceptance and commitment therapy in drug abuse in women prisoners ^[66]. After 16 sessions of acceptance and commitment therapy, the avoidance rate was 27.8 percent, and after six months, the rate reached 43.8 percent. Treatment also improved in areas such as mental disorders, anxiety sensitivity, and psychological flexibility. Foruzanfar, Gholam-Ali Lavasani, and Shoa Kazemi (2017) investigated the effectiveness of group counseling based on acceptance and commitment therapy in boredom tolerance and anxiety sensitivity of women with drug abuse ^[67]. The results showed that group-based acceptance and commitment therapy increased boredom tolerance and decreased women sensitivity to drug abuse.

The impact of group-based acceptance and commitment therapy in increasing the self-efficacy of women with drug abuse is likely due to the educational content presented and practiced in the sessions. The goal of the first step in acceptance and commitment therapy was to create a context for acceptance of annoying thoughts, feelings, and emotions. In the initial sessions, with the help of metaphors and exercises, the costs of the previous efforts of the group members to control and manage the annoying emotions were examined and the

uselessness of the control was revealed for them. Then, the members of the group started to learn some basic skills of staying with the annoying feelings and thoughts and looking at it from the perspective of a mindful observer. These exercises helped them to interact experimentally with the feared and avoided thoughts, feelings, memories, and body sensations. They learned to practice mindfulness skills in the presence of annoying thoughts and feelings. Mindfulness exercises are an important skill to learn, since it neutralizes strategies to avoid past experiences aimed at controlling or reducing anxiety-related distresses in the path of valuable activities. Finally, it focused on discovering the values of group members' lives and identifying barriers to values and committing them to achieve goals and moving in the direction of values. In this approach, mindfulness exercises, along with acceptance techniques, discussing on one's values and goals, and the need to clarify values and behavioral commitment led to improved self-efficacy for women with drug abuse.

Sub-Hypothesis 2: Group-based acceptance and commitment therapy training is effective in the components of impulsivity (cognitive impulsivity, non-motor impulsivity, non-planning impulsivity) of addicts in addiction treatment centers of Gorgan city. According to the information of tables (4-15) and (4-16), the results of multivariate analysis of covariance showed that acceptance and commitment therapy training reduced cognitive impulsivity, non-motor impulsivity, and non-planning impulsivity in addicted women in the experimental group.

The results of testing this hypothesis are consistent with the results of some previous studies. McClure, Bricker, Moll, and Heffner (2020) compared the effectiveness of group-based acceptance and commitment therapy and cognitive-behavioral therapy for smoking cessation in the form of a randomized controlled trial. The 30-day avoidance rate during the 12-month follow-up period did not show a difference between the two study groups in the initial analysis or in the sensitivity analysis. In this randomized trial, group-based acceptance and commitment therapy and cognitive-behavioral therapy did not differ in terms of long-term smoking cessation rates. However, group-based acceptance and commitment therapy was a reasonable alternative to cognitive-behavioral group therapy for smoking cessation. In the study conducted by Hasani, Hasani and Niaei (2017), the effectiveness of group-based acceptance and commitment therapy in impulsivity of patients with depression was examined. The results showed the effectiveness of acceptance and commitment therapy in reducing impulsivity and attention / cognitive impulsivity, motor impulsivity and non-planning impulsivity in both groups of patients with type 1 bipolar disorder and major depressive disorder. In a study conducted by Morrison (2016), the effectiveness of acceptance and commitment therapy in impulsive decision-making was examined.

The results showed that this therapy increased productivity, flexibility towards emotions, thoughts and physical states, and acceptance and commitment therapy was a useful therapy to help people change their behavior and increase their quality of

life. In a study by Stutt et al (2012) under the title of "First-stage pilot study on the effect of acceptance and commitment therapy on methadone detoxification", the results showed that there was no difference in drug use during treatment. 37% of the participants in the group-based acceptance and commitment therapy were successfully detoxified at the end of the treatment, and this rate was 19% for the members of the group received drug use counseling. In the group-based acceptance and treatment group, the fear of detoxification also decreased over time compared to the drug use counseling group. In a study conducted by Li, Ann, Levine, and Twohig (2015) under the title of "An initial meta-analysis of acceptance and commitment therapy to treat drug abuse disorders," a low to moderate effect size in favor of acceptance and commitment therapy was observed. In a study conducted by Jahangiri, Golmohammadian and Hojjatkah (2016), the effectiveness of acceptance and commitment therapy on rumination and psychological flexibility in methadone-treated addicts was studied ^[68]. The results showed that acceptance and commitment therapy was effective in increasing psychological flexibility and reducing rumination.

In explaining the effectiveness of acceptance and commitment therapy in reducing the impulsivity components of women with drug abuse, it can be stated that in acceptance and commitment therapy, cognitive defusion is the effect of a thought (e.g., desire to use) on behavior. Context-dependent behavior and thought-dependent behavior are placed in the spectrum of cognition fusion or cognitive defusion and when a person is fused with his or her thoughts, he or she cannot distinguish his or her mental judgment from reality (Brown et al., 2007; quoted by Hamed et al., 2013) ^[69]. Hayes et al. (2012) believe that acceptance and commitment therapy, instead of eliminating harmful factors, helps people to accept their uncontrolled emotions and cognitions and be saved from controlling the verbal rules that have caused problems for them. This therapeutic approach seeks to reduce one's impulsivity by creating psychological flexibility on the one hand and encouraging him or her to act on individual values. In fact, the goal of treatment is to help people create a rich, complete and meaningful life. These techniques reduce impulsivity by increasing one's awareness of current experiences and returning attention to the cognitive system and more efficient processing of information. Another process of this treatment that helps to reduce impulsivity is the creation of a self-observer in clients through the application of defusion skills, mindfulness and contact with the present moment. In fact, this self-observer has replaced the self-conceptualized. In fact, it is a self that is defined by thoughts, feelings, memories, and physical feelings. The great advantage of this self is that it is viewed as a context in which the content of consciousness is not threatening. In general, the goal is that clients understand that they should separate themselves from their inner experiences (Hayes and Strossal; translated by Alizadeh Mousavi and Pirjavid, 2015) ^[64]. In general, in the process of training, efforts were made to help clients allow the thought come and go instead of being trapped

in these thoughts with the practice of cognitive defusion. By replacing self as a context, they learned to be a context for experiencing unwanted and painful emotions, thoughts, and feelings, without being engaged in them. On the other hand, clarifying values and committing to doing things in the direction of values, despite the problems, helped them get rid of being trapped in negative thoughts and feelings and to find a sense of vitality, meaning and purposefulness. In general, using the main processes designed to reduce ineffective and problematic avoidance from emotional pain, acceptance and commitment therapy explicitly targets experimental avoidance by increasing experimental acceptance and awareness of thought ^[70]. Thus, it can be stated that this treatment can be effective in reducing the components of impulsivity in addicted women.

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