The Effectiveness of Cognitive Emotion-Regulation Strategies in the Improvement of Executive Functions in Recovered Addicts in Drug Information Centers (DICs)

Borhani, A.; Moradi, A.; Mirani, R.

Borhani, A.;
M.A. in Clinical Psychology, Kharazmi University, Karaj, Iran, Email: meysamborhani9@gmail.com

Moradi, A.
Professor of Clinical Psychology, Kharazmi University, Tehran, Iran

Mirani, R.
M.A. in Clinical Psychology, Kharazmi University, Tehran, Iran

Abstract

Objective: The current study was an attempt to investigate the effectiveness of cognitive emotion-regulation strategies in the improvement of executive functions among the addicts recovered in drug information centers (DICs). **Method:** An experimental research design along with pretest-posttest/follow-up and control group was used to conduct of this study. The sample size of the study consisted of 24 male addicts recovered in Drug Information Centers in Karaj who were selected by a convenience sampling method and were randomly assigned to control and experimental groups. The experimental group received Gross Emotion Regulation Strategies for ten sessions, while the control group did not receive any intervention until the end of the project. Wisconsin Card Sorting Test was used for data collection and multivariate analysis of covariance analysis was used for data analysis. **Results:** The results of this study showed that the training of cognitive emotion-regulation strategies led to the promotion of executive functions in the experimental group. **Conclusion:** Training of cognitive emotion-regulation strategies has useful implications for the treatment and prevention of addiction relapse.

Keywords: cognitive emotion-regulation, executive functions, addiction, harm reduction centers

Research on Addiction Quarterly Journal of Drug Abuse
Presidency of the I. R. of Iran
Drug Control Headquarters
Department for Research and Education

Vol. 11, No. 41, Spring 2017
http://www.etiadpajohi.ir

Introduction

One of the serious health threats that has received the attention of health care centers, law enforcers, and social policymakers in recent years due to rapid social changes is the prevalence of addiction and high-risk behaviors among different strata of the society (Fergosen, 2009). With regard to the etiology of substance abuse and relapse rates after treatment, various researchers and theorists have referred to emotional dysregulation, low tolerance for discomfort, emotional avoidance, impulsive and habitual behaviors, rumination, bias towards drug cues, low self-efficacy, defects in coping skills, and spiritual error (Blum, 2005; as cited in Babaei, 2012). The low level of emotion regulation that results from the inability to effectively cope with and manage emotions is involved in the beginning of drug use (Parker, Taylor, Eastabrook, Schell, & Wood, 2008). Executive function is one of the psychological functions of an individual with substance abuse disorder. Executive functions refer to the multidimensional cognitive control process, which includes the ability to evaluate, organize, and achieve goals. It is also a capacity for the flexibility of adaptive behaviors in the face of a new problem and position. The results of cognitive development research show that the growth of emotional regulation is strongly supported by several cores of executive functions, such as attention control, inhibition of inappropriate behaviors, decision making, and other high-level cognitive processes (Tatenham, Herit & Kasy, 2011). There is a wealth of evidence from several studies that suggests the growth of some aspects of executive functions, such as controlled inhibition and executive attention are strongly correlated with increased emotion perception and emotion regulation. The development of cognitive science supports the claim that executive functions and emotion regulation are correlated with each other. Emotion and cognition are interconnected in a complex manner and both of them serve to process and function information (Bell, & Wolphe, 2007). In addition, it is likely that emotion regulation and executive functions affect each other. Emotions can be used to help people organize their thoughts, learning, and action; and cognitive processes also receive feedback from individuals' emotion regulation (DeLeon, 2009). Emotions play a major role in all affective disorders. Emotional dysregulation occurs in most psychological disorders (Aldao, Nolen-Hoeksema, & Schweizer, 2010).

Emotional management ability makes it possible for an individual to use appropriate coping strategies in situations where the risk of drug use is high (Trinidad & Johnson, 2002). Although emotions have a biological basis, individuals are able to influence the methods through which they express these emotions. This ability, which is called emotion regulation, refers to processes that influence the person's current emotions and how s/he experiences and expresses them (Gross, 2010). Effective management of emotions includes: 1. Relief and calmness of the self in the times of distress and sadness; 2. Self-

control; 3. Anger management; 4. Control of impulses; 5. Emotional expression at the right time and place; 6. Avoidance of persistent anxiety, anger, and depression; 7. Management of inevitable life failures and problems; 8. Prevention of the influence of negative emotions on judgment and problem-solving ability; 9. Tolerance of failures; and 10. Self-acceptance and self-value (Clark, 2001; as cited in Rostami & Niloufari, 2010). Since emotion regulation plays a central role in normal development and its weakness is an important factor in the incidence of psychological disorders, theorists believe that the ones who are not able to properly manage their emotions against everyday events show diagnostic symptoms of psychological disorders to a large extent, and their quality of life is significantly reduced (Kleber, 2009).

The core of treatment in this research is the training of cognitive emotion-regulation strategies based on Gross's model (2003). Grass based on the model of exciting production quality, presented the model of the process of excitement regulation, which consists of five stages (onset, situation, attention, appraisal, and response). Gross believes that every stage of the emotion-generation process has a potential emotion regulation goal, and emotion regulation processes can be applied at different points in the process. Based on the original model, Gross presented an emotion regulation process model and identified five points of emotion generation where every point is the location of the actions of a family during emotion regulation processes. These five points include situation selection (avoidance), situation modification (self-expression), attentional deployment (distraction), cognitive change (marketing), and response modification (inhibition). At the onset of an emotion, there are factors that put an individual in the position of emotional excitement or avoid him/her from that position (avoidance). In the second step or situation modification, one can make changes in the process of emotion generation. At this stage, one of the strategies for emotion regulation is self-expression. In the third step (attention), one of the methods for change creation and emotion regulation is directional change and/or attentional deployment. Indeed, distraction, concentration, and rumination are three methods of attentional deployment. Among these techniques, distraction is considered one of the metacognitive techniques of emotion regulation (Papageorgiou & Wales, 2007). Through concentration, one focuses his/her full attention on a particular situation or one aspect of it, and rumination involves focusing attention on emotions and its consequences. In the fourth step of emotion generation (appraisal), creation of cognitive changes is the responsibility of emotion regulation and one of its strategies is cognitive marketing. The last step is the response phase, and the response modulation constitutes the last part of the emotion regulation process.

Axelrod, Perepletchikova, Holtzman, & Sinha (2011) examined emotion regulation and the frequency of substance abuse in women with substance abuse and borderline personality disorder receiving dialectical behavioral therapy. They concluded that the improved emotion regulation not only led to the

improvement of mood, but also reduced the frequency of substance abuse. In addition, Szasz, Szentagotai, & Hofmann (2011) investigated the effectiveness of the training of regulatory strategies on smoking craving, attentional bias, and negative emotions, and concluded that the individuals who use more marketing strategies have lower degrees of craving, fewer negative emotions, and reduced attentional bias against smoking symptoms. In another study, Dimeff, & Korner (2007) have shown that substance users have difficulties in the regulation of their emotions and their negative emotional states accelerate substance use. In fact, the management of emotions is referred to as the internal and external processes that are responsible for the control, evaluation, and change of one's affective and emotional reactions to the course to achieving his/her goals, and any defects in the regulation of emotions can make the person vulnerable to psychological disorders (Garnefeski & Kraaij, 2003). Therefore, it can be claimed that emotion regulation is a key determinant in psychological well-being and effective functioning (Garnefeski et al., 2001). It plays an essential role in one's adaptation to stressful life events (Gross, 1998) in such a way it can be argued that emotional regulation impacts one's overall quality of life (Mashhadi, Mirdoraghi, & Hasani, 2012). In fact, research findings show that the effective regulation of emotions has favorable consequences on psychological health, psychological well-being, physical health, and interpersonal relationships (Ryff & Singer, 1998; as cited in Hasani, 2012).

Due to the widespread prevalence of psychotropic substances in Iran, especially among young people, the need for the control and curb of this phenomenon is strongly felt in many respects. In recent years, remarkable scientific efforts have been made in two fundamental and applied approaches in order to fight against this challenging problem. However, considering the sensitivity of this issue, the provision of various therapeutic and training methods can be very effective. The present study is also focused on this perspective; in particular, it deals with two basic aspects of psychological health, namely emotion and cognition (executive functions) and the rehabilitation of these aspects. This research has addressed the issue of addiction treatment, both in fundamental and applied approaches. In other words, considering the relationship between emotion regulation and the components of executive functions (planning, problem-solving, controlled inhibition, working memory, etc.) and the effect of emotion and cognition on the humans' quality of life, this research seeks to evaluate the effectiveness of training of emotion regulation process strategies the improve of executive functions in recovering addicts in drug information centers (DICs).

Method

Population, sample, and sampling method

An experimental research design along with pretest-posttest/follow-up and control group was used for the conduct of this study. Both groups were evaluated

in three stages, pre-test, post-test, and follow-up during the three-month implementation of the program. The statistical population of this research included all the recovered addicts in 2016 who have started working at Alborz DIC right now. From among them, 24 male addicts were selected by a convenience sampling method and were randomly assigned to control and experimental groups. Both groups had 12 members and only one participant left the experimental group up to the end of the research. The entry criteria for inclusion in the study were history of drug abuse, being male, not using narcotic drugs and addiction treatment drugs at the time of the research, aged between 30 and 60 years, holding a minimum education degree of high school diploma, and consent to participate in the research. The exit criteria were the receipt of other psychological interventions, drug use during research, and taking psychiatric drugs.

Instrument

Wisconsin Card Sorting Test (WCST): This test has been widely used in the study of abstract behaviors and cognitive flexibility. The most common indexes for the measurement of cognitive functions in WCST are the number of categories achieved by individuals and the rate of preservative errors (Strauss, & Alesander, 2006). In this test, the number of categories achieved refers to the ten cards selected sequentially and correctly on the basis of the desired criterion, which amounts to a maximum of six categories. Perseverative errors include the number of errors that are made by the respondent after considering the new rule and receiving feedback. This test was first designed by Grant, & Berg (1948). The test consists of two sets of 64 non-similar cards with green, blue, red, and yellow colors and in the shapes of triangles, stars, crosses, and circles with the number of one, two, three, and four cards as response cards, and four cards as the stimulus cards. To run the test, at first, four stimulus cards are placed in front of the respondent. The tester first sets color as the criterion for classification without informing the individual about this principle and s/he will place the rest of the cards one by one below four template cards. After each attempt, s/he is told whether or not his/her categorization is correct. If the respondent manages to perform 10 consecutive categorizations correctly, the classification principle will change, and the next principle will come effective. The principle shift is only done by changing the yes/no feedback pattern. Thus, the previous correct answer is considered false in the new principle. The next principle is based on the frequency and the number of times and, then, the three principles are repeated in sequence. The test is stopped when the respondent can successfully categorize six classes correctly. The validity of this test has reported to be 0.86 for cognitive deficits followed by high brain lesion, and its reliability on an Iranian sample was obtained equal to 0.85 through re-test method and 0.83 through inter-rater reliability method (Moradi, Jabari, Mir'aghayi, & and Parhoon, 2011).

Procedure

The qualified patients were selected via convenience sampling method. Thereafter, some information was provided on the type of treatment, attendance of participants in the sessions, and the number and length of the sessions. Sessions were held in the center (once a week). The individuals were working at the center 24 hours. At the beginning of the treatment, the pre-test was administered to them and the indexes of executive functions were evaluated. Subjects were then trained in a 10-session period in terms of emotion regulation processes. To control the threatening factors of the internal consistency of the research, a control group was also considered. The members of this control group were only present at the center and received no special treatment. At the end of the sessions, the indexes that had been assessed in the pre-test were post-tested. In addition, a one-month follow-up was also conducted.

The content of the training sessions of emotion regulation processes based on Gross model is presented in Table 1. The Complete Therapy Package of Emotion-Regulation Strategies was validated by Jahromi, Hasani, & Hatami (2013). Regarding what is observed in the content of the training sessions, the therapist categorizes the skills for substance abuse behaviors while teaching strategies of the emotion regulation processes based on Gross model. Each session took 90 minutes.

Table 1: The content of training sessions of emotion regulation strategies based on Gross Model

Sessions	*Steps*	*Content*
First	-	Mentioning the logic and stages of the intervention, the need for emotion regulation, the reason for learning this skill, the right views about emotions, a review of the initial and secondary emotions, the helpfulness of all the emotions
Second	Situation selection	Presentation of emotional training: Normal emotions and problematic emotions, emotional self-awareness: 1) Training and introduction of emotions, 2) Identifying, naming, and labeling the emotions, 3) Differentiation between different emotions, 4) Identifying emotions in physical and psychological states, and 5) Success factors in emotion regulation.
Third	Situation selection	Assessing the members' degree of vulnerability and emotional skills: 1) Self-assessment with the aim of identifying one's own emotional experiences, 2) Self-assessment with the aim of identifying the degree of emotional vulnerability in the person, 3) Self-assessment with the aim of identifying individual regulation strategies, 4) Cognitive consequences of emotional reactions, 5) Physiological consequences of emotional reactions; 6) Behavioral consequences of emotional reactions and the relationship of the three mentioned types of consequences with each other, and 7) An introduction to the anger emotion and the strategies to cope with it.
Fourth	Situation modification	Creating a change in the position of emotional stimulation: 1) Preventing social isolation and avoidance, 2) Training the problem-solving strategies, and 3) Interpersonal skills training (conversation, self-expression, conflict resolution).

Table 1: The content of training sessions of emotion regulation strategies based on Gross Model

Sessions	*Steps*	*Content*
Fifth	Attentional deployment	Attentional change: 1) Stopping rumination and worry, and 2) Attention training
Sixth	Cognitive appraisal	Changing cognitive assessments: 1) Identifying the wrong assessments and their effects on emotional states, and 2) Training the open evaluation strategy
Seventh	Response modulation	Changing the behavioral and physiological consequences of emotions: 1) Identifying the extent and method of using inhibitory strategy and examining its emotional consequences, 2) Exposure, 3) Training how to express emotions, 4) Behavioral modification through the change of environmental reinforcements, and 5) Training the emotional discharge, relaxation, and reverse action
Eighth	Evaluation and performance	Reappraisal and removal of implementation barriers: 1) Assessing achievement goals, 2) Using the learned skills in natural settings outside of the sessions, 3) Checking and removing the obstacles to the fulfillment of tasks
Ninth	-	Wrap-up of the previous sessions and practice of the learned skills
Tenth	-	Wrap-up of the previous sessions and practice of the learned skills

Results

The age range of the experimental group was between 30 to 58 years old with the mean age of 41.2 years; and the control group was within the 31-to-56-year-old age range with the mean age of 41.3 years. The descriptive statistics of the research variables are presented in Table 2 for each group and test type.

Table 2: Descriptive statistics of the research variables for each group and test type

Variable	*Group*	*Pre-test*	*Post-test*	*Follow-up*
Correct attempts	Experimental	75.33	86.36	85.54
	Control	74.75	77.08	77.41
Perseverative responses	Experimental	15.81	12.00	11.72
	Control	15.33	14.33	14.25
Perseverative errors	Experimental	10.90	8.27	8.36
	Control	10.90	10.50	10.50
Categories completed	Experimental	3.81	5.09	5.00
	Control	3.83	3.83	3.91

Multivariate covariance analysis should be used to examine the effectiveness of the intervention in executive functions. One of the assumptions of using this analysis is the equality of error variances. The results of Levene's test indicated that this assumption has been met in all variables ($P > 0.05$). Another assumption of this analysis is the equality of variance-covariance matrices. The results of the Box's test indicated that this assumption has also been met ($P > 0.05$; M Box = 2.34). Therefore, multivariate analysis of covariance was run and the results indicated the existence of a significant difference between the two groups in the linear combination of the components (Eta-squared = 0.84; $P < 0.001$; $F = 24.20$; Wilks's Lambda = 0.15). To examine the patterns of difference, univariate analysis of covariance was used and its results are presented in table 3.

Table 3: Univariate covariate analysis results examining patterns of differences in the components

Variable	*F*	*Sig.*	*Test power*
Correct attempts	86.79	0.0005	0.81
Perseverative responses	78.45	0.0005	0.79
Perseverative errors	75.79	0.0005	0.79
Categories completed	18.33	0.0005	0.80

Discussion and Conclusion

The aim of this study was to investigate the effectiveness of cognitive emotion-regulation strategies in the improvement of executive functions among the addicts recovered in drug information centers (DICs). In this research, the treatment sessions were held in ten 90-minute sessions in line with the therapeutic protocol of training the strategies of emotional regulation process based on Gross model. The protocol was developed by James Gross (2003) to teach how to manage and regulate people's emotions. One of the most important factors in the onset and continuation of substance abuse is the difficulty in emotion regulation. In fact, emotion regulation is a major factor in the onset of addictive behaviors and the continued effects of these behaviors on the patients' cognition and other life areas. According to related research findings, emotions can be both an organizer of attention and an obstacle to the organization of attention; they can both facilitate and debilitate problem-solving. They also trigger the creation and break-down of relationships. These two-way interactions between emotion regulation and components of executive functions illustrate the need for emotion regulation training to improve executive functions (Neumann et al., 2010).

The addiction approach as a brain disease is the approach that developed over the last few years on the issue of addiction in the world and is one of the most effective theoretical approaches in this field. Addiction has received increasing attention as a chronic and relapse brain disorder (Mintzer & Stizer, 2002). Drug use can cause psychosomatic neurological damages, including damage to executive functions. Substance abuse brings about a wide range of behavioral problems (including delaying and preventing the onset of tasks, instability in achieving goals, and reducing control over emotions and affects), reduced inhibition of response that results in impulsive responses and inappropriate social behaviors, and impaired executive functions (Weinstien & Shaffer, 2008).

The findings of the present study are consistent with those of previous studies with regard to the effect of emotion regulation on the executive functions (Gross, 2003; Smyth & Arigo, 2009; Eisenberg et al., 2005). Lewis (2004) compared emotion regulation with executive functions components and asserted that the concepts of emotion regulation and executive functions are similar to each other. An adolescent with a desired emotion regulation ability can control his/her behaviors and act more flexibly in various contexts and can act more adaptively in the face of stressful events. Emotion regulation can also be considered as a

means to understand how emotions impact other processes, such as attention, problem-solving, and behavior. Mayer & Salovey (2007) have shown that emotion regulation is accompanied by more mental capacity for information processing. This capability can help individuals better understand the negative and harmful effects of drug use and, therefore, they will be more successful in coping with psychological and social pressures. Some studies have shown that cultural groups are different in actions and the frequency of emotional inhibition or suppression and the consequent degree of negative emotions. It seems that research on the area of the expression or suppression of emotions has entered the area of norms and cultural values to a lesser extent in Western countries. For example, in contrast to Western culture where emotional suppression is viewed to be associated with symptoms of psychological trauma, there is a wide range of conditions in Asian culture that encourage the suppression or avoidance of emotions, while in European countries self-supporting functions are emphasized (Isa-zadegan et al., 2012).

To account for the effectiveness of emotion regulation training in executive functions, it can be argued that emotion regulation strategies help individuals to regulate negative excitements and emotions. This regulation method has a direct relationship with the growth, progression, or incidence of mental disorders (Kraaij, Pruymboom, & Garnefski, 2002). Emotion regulation reduces negative feelings, increases the positive feelings, and enhances adaptive behavior in individuals (Gross & John, 2003). Some research suggests that the ability of successful emotion regulation is associated with a number of physical, psychological, and social health outcomes. On the contrary, it is assumed that emotion dysregulation is the underlying mechanism of many psychological disorders. Emotion regulation coordinates biological, psychological, and motivational processes, stabilizes the individual's situation in relation to the environment, equips the person with special and efficient responses, and, ultimately, brings his/her physical and social survival. On the other hand, emotions play an important role in the creation, maintenance, and interruption of interpersonal relationships by balancing the distance between people because emotions bring people together or distance them from each other (Eisenberg et al., 2010). It seems that there is a significant overlap between the components of executive functions and emotion regulation. The issues of attention, focus, displacement, information processing, problem-solving, and many other concepts of executive functions are remarkable points in emotion regulation. When executive functions are improved in parallel with emotions through emotion regulation training, the outcome can be observed in the promotion of individuals' quality of life. In general, it can be concluded that the improvement of executive functions and emotion regulation in treated addicts can lead to the continued treatment and reduced rate of relapse and re-use. The creation and even survival of hope for treatment and life requires the assignment of attention to the threatening factors in addicts' life and also to the development of patients'

skills and functions. Therefore, the development of prevention programs in the second and third levels requires the continuity of the treatment process and any policy planning at the macro level requires attention to the improvement of the individual's ability, especially executive functions in different fields (Narimani, Arianpour, & Ahmadi, 2011). In general, it can be concluded that the improvement of emotion regulation in addicted people can lead to continued treatment and reduced rate of relapse and return to drug consumption.

Reference

Abolghasemi, A., Allahgholilu, k., Narimani, M., Zahed, A. (2010). Emotion regulation strategies in substance abusers have high reactivity and low. *Journal of Guilan University of Medical Sciences*, 20(77), 15-22.

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review*, 30(2), 217-237.

Axelrod, S. R., Perepletchikova, F., Holtzman, K., & Sinha, R. (2011). Emotion regulation and substance use frequency in women with substance dependence and borderline personality disorder receiving dialectical behavior therapy. *The American journal of drug and alcohol abuse*, 37(1), 37-42.

Babayi, Z., Hasani, G., Mohammadkhani, SH.(2012). The effects of emotion regulation skills training based on dialectical behavior therapy tempted people with substance abuse. Single-subject study. *Journal of Clinical Psychology*, 4(3),15-21.

Bell, M. A., & Wolfe, C. D. (2007). The integration of cognition and emotion during infancy and early childhood: Regulatory processes associated with the development of working memory. *Brain and Cognition*, 65(1), 3-13.

Blume, A. W. (2005). *Treating drug problems*. New York: John Wiley.

Cakmak, A. F., Cevik, E. I. (2010). Cognitive emotion regulation questionnaire: Development of Turkish version of 18- item short form. *African Journal of Business Management*, 4, 2097-2102.

Clark, M., Hampson, S. E. (2001). Implementing a psychological intervention to improve lifestyle self–management in patients with type 2 diabetes. *Patient Education and Counseling*, 42(3), 245-256.

DeLeon, G. (2009). *The therapeutic community: Theory model and method*. New York: Springer.

Dimeff, L. A., Korner, K.(2007). *Dialectical behavior therapy in clinical practic*. NewYork: Gilford press.

Eisenberg, N., Sadovsky, A., Spinrad, T. L., Fabes, R. A., Losoya, S. H., Valiente, C., ... & Shepard, S. A. (2005). The relations of problem behavior status to children's negative emotionality, effortful control, and impulsivity: concurrent relations and prediction of change. *Developmental psychology*, 41(1), 193-211.

Furgus, S., & Zimer man, M. A. (2009). Adolesent resilience: A framwork for anderstanding healthy development in the face of risk. *Annual Review of public Health*, 26, 399-419.

Garnefski, N., Teerds, J., Kraaij, V., Legerstee, J., Kommer, T. (2003). Cognitive emotion regulation strategies and depressive symptoms: Differences between males and females. *Personality and Individual Differences*, 25, 603-611.

Garnefski, N., Van-Der-Kommer, T., Kraaj, V., Teerds, J., Lederstee, J., Tein, E. O. (200١). The relationship between cognitive Emotion Regulation Strategies and Emotional problems: Comparison between a Clinical Sample. *European Journal Personality*, 16, 403-420.

Grant, D. A., & Berg, E. (1948). A behavioral analysis of degree of reinforcement and ease of shifting to new responses in a Weigl-type card-sorting problem. *Journal of experimental psychology*, 38(4), 404-411.

Gross, J. J. (1998).The emerging field of emotion regulation:An integrative review. *Review general Psychology*, 2(3), 271-299.

Gross, J. J., John, O. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal Personality Society Psychology*, 85(2), 348–362.

Lewis, D. L. & Stieben, J. (2004). Emotion regulation in the brain: Conceptual issues and directions for developmental research. *Child Development*, 75, 371-376.

Mashhadi, A., Mirdurghi. F., Hasani, G.(2011). The role of cognitive emotion regulation strategies in internalizing disorders in children. *Journal of Clinical Psychology*, 3(3), 23-34.

Mayer, J. D., & Salovey, P. (2007). Emotional intelligence meets traditional standards for an intelligence. *Intelligence*, 27(4), 267-298.

Mintzer, M. Z., Stitzer, M. L. (2002). Cognitive impairment in methadone maintenance patients. *Drug Alcohol Depend*, 67, 41-51.

Moradi, A., Jabbari. H., Miraghayi. A., Parhon, H. (2011). AIDS patients in executive function performance. *Journal of Modern Psychology*, 6, 15-24.

Nejat, S., Montazeri, A., Holakouie Naieni, K., Mohammad, K., Majdzadeh, S. R. (2006). The World Health Organization Quality of Life Questionnaire: Translation and validation study of the Iranian version. *Journal of School of Public Health and Institute of Public Health Research*, 4(4), 1-12.

Parker, J. D., Taylor, R. N., Eastabrook, J. M., Schell, S. L., Wood, L. M. (2008). Problem Gambling In Adolescence: Relationships with Internet Misuse, Gaming Abuse and Emotional Intelligence. *Personality and Individual Differences*, 45, 174-180.

Ryff, C. D., Singer, B. (1998). The contours of positive human health. *Psychology Inquiry*, 9(1), 1-28.

Struss, D. T., & Alesander, M. P. (2006). Executive function and the frontal lobes: A conceptual view. *Psychological reaserch*, 63(3-4), 289-298.

Smyth, L., Arigo, P. C. (2009). Trait emotional intelligence, conflict communication patterns, and relationship satisfaction. *Personality and individual differences*, 44(6), 1314-1325.

Szasz, P. L., Szentagotai, A., & Hofmann, S. G. (2011). The effect of emotion regulation strategies on anger. *Behavior research and therapy*, 49(2), 114-119.

Tottenham, N., Herii, A., Voss, H. U., Glover, G. H., & Casey, B. J. (2011). Biological substrates of emotional reactivity and regulation in adolescence during an emotional go - no go task. *Biological psychiatry*, 63(10), 927-934.

Trinidad, D. R., Johnson, C. A. (2002).The Association between Emotional Intelligence and Early Adolescent Tobacco and Alcohol Use. *Personality and Individual Differences*, 32(1), 95-105.

Weinstein, C. S., Shaffer, H. J. (2008). Neurocognitive aspects of substance abuse treatment: A psychotherapist's primer. *Psychotherapy Theory Research & Practice,* 30, 317-333**.**