

Research Article

Emotional Adaptation Using a Program Based on Cognitive Emotion Regulation Strategies in Patients with Substance Use Disorder: A Randomized Control Trial Study

Musarezaie A¹, Ghelbash Z², Pezeshkzad S³,
Momeni-Ghale Ghasemi T¹, Alidousti F¹ and
Rezazadeh M^{*}

¹Department of Adult Health Nursing, Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran

²Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran

³Department of Counseling Psychology, Faculty of Psychology and Education, Allameh Tabataba'i University, Tehran, Iran

***Corresponding author:** Meysam Rezazadeh, Department of Adult Health Nursing, Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran

Email: meysam_rezazadeh@hotmail.com

Received: May 07, 2025

Accepted: June 11, 2025

Published: June 13, 2025

Abstract

Background: Disturbances in emotion regulation and emotional adaptation are common problems in drug users. This issue affects the quality of life in different dimensions. Therefore, it seems that the training of cognitive emotion regulation strategies as a supplement to drug treatment in these people helps improve adaptation skills. In this study, we investigated the effect of a training program based on cognitive emotion regulation on the emotional adaptation of patients with substance use disorder.

Materials and Methods: This study was a clinical trial that was conducted in 2022-23. Forty-eight men with substance use disorder (SUD) under methadone maintenance treatment (MMT) participated in the study. The participants were randomly divided into two intervention and control groups. The intervention consisted of six training sessions based on the cognitive regulation of emotion, which were provided over three weeks. In this study, SPSS version 26 statistical software was used for data analysis.

Results: There was a significant difference in the mean score of the emotional adaptation scale between the intervention and the control group after conducting the intervention ($P = 0.012$).

Conclusion: Educational programs based on emotion regulation can play a significant role in improving emotional adaptation in patients with substance use disorder under methadone maintenance treatment. Therefore, this educational program is suggested as a complementary psychological approach to improving the level of psychological health of patients with substance use disorder.

Keywords: Emotional Regulation; Adaptation; Substance-Related Disorders; Methadone

Introduction

Recent estimations show that almost 35 million people worldwide suffer from substance use disorder (SUD) [1]. Using substances is a chronic turning disorder that, despite its negative outcomes, is diagnosed by losing behavioral resistance control and disturbance in interpersonal and social interactions [2]. Epidemiological studies are constantly reporting high rates of psychological problems in SUD, among which is a lack of access to effective strategies for regulating emotions [3]. In this regard, emotional adaptation, a significant variable, is known both as a prohibitive factor from reuse and a

preventive factor [4]. Emotional adaptation is a set of psychological states, such as desirable psychiatric health, individual life satisfaction, and concordance among emotions, activities, and thoughts. Therefore, emotional adaptation can be regarded as a mechanism by which a person reaches emotional stabilization [5]. Emotional adaptation calls for awareness of one's capabilities and accepting deficiencies. People who are categorized with a low level of emotional adaptation lack self-awareness; this condition may lead to decreased self-confidence, and they will not be able to reach a stable emotional state [6].

Applying psychological interventions such as cognitive regulation of emotions based on one's lifestyle and improving their adaptation and emotional regulation capabilities influences their devotion to treatments and comprehensively avoids repeated slippage [7]. In this regard, the results of a systematic study revealed that people with SUD struggle with more problems than people without SUD [8].

Cognitive emotional regulation refers to the observation capacity, evaluation, understanding, and modification of emotional reactions in a way that applies to an adaptive performance [9]. Cognitive-emotional regulation is a key social-emotional capability that enables flexibility in emotion-provocative situations [10]. Cognitive-emotional strategies are significant in emotional administration or regulation ability, as well as in preserving control over emotions during or after facing threatening or stressful incidents [11]. Farnam et al., in their study, revealed that people exposed to high-risk SUD show less emotionally regulated behaviors compared to those exposed to less risky SUD [12]. Additionally, Shabani et al. revealed that not controlling emotions can work as a predictive factor for orientation toward addiction [13]. In contrast, weak emotional regulation is a metacognitive feature for diagnosing many psychiatric disorders and severely interferes with SUD [14]. Basharpour et al. have also shown in their study that difficulty in cognitive-emotional regulation can predict resistance toward change or disorder in adaptation level in people with SUD [15]. Moreover, the study by Garke et al. showed that inefficient strategies of cognitive-emotional regulation, such as repressing and repressing thoughts, may badly affect the lives of people with SUD [16]. Therefore, weak emotional regulation may be common among people with SUD, and it can be a good target for clinical treatments and improvements [14]. Hence, it seems that developing a better comprehension of the methods by which one can influence emotional adaptation is highly important. Thus, in the present survey, the effect of an educational program based on cognitive emotional regulation on emotional adaptation in patients with SUD under MMT was investigated.

Materials and Methods

Design

This is a randomized clinical trial carried out on two groups with a one-to-one relation.

Sample Size and Participants

The participants of the present study were 48 males with SUD under MMT who reside in a rehabilitation center in Isfahan.

The sample size of this study was determined by NCSS software with and 20 percent fall based on a study by Esmaili et al. as well as the mean of changes before and after the intervention of 48 people in a way that there were 24 members in each group [17].

Randomization

The researcher divided the qualified participants into two control and intervention groups using a stochastic block model before starting the intervention. The size of all the blocks was the same, and in this two-group randomized trial, the quadruple blocks consisted of two participants in the intervention group and two participants in the control group. In this way, there were 12 quadruple blocks,

which divided the participants into two 24-person groups. The randomization tool was Random allocation software; this software not only does simple randomization but is also capable of creating random sequences by block making. Each generated random sequence was recorded on a card, and the cards were enveloped in order. To preserve random sequencing, the external surfaces of the envelopes were numbered in the same order. Finally, the envelopes were sealed and placed in the box in order. When registration started, based on the order of qualified participants' entrance to the study, one of the envelopes was opened, and in this way, the group to which the participant belonged was determined.

Intervention

The researcher announced the arbitrary participation, anonymity of personal information, and the right to withdraw from the study and that participation in this study would not cost anything in a group session.

She also presented the purpose and method of the investigation. The participants were first rated based on the criteria for entrance to the study, which were as follows: age above 18; reading and writing ability; more than six months SUD record; having at least one rehabilitation experience; and using MMT. The qualified individuals who were willing to participate in the study signed a consent letter. Then, a demographic information questionnaire along with a Rubio emotional adaptation questionnaire were completed at the beginning of the study on 2022/9/23 by participants.

Thereafter, the participants were randomly divided into two control and intervention groups. Moreover, the participants were evaluated in the course of the investigation in terms of withdrawal criteria, including more than one session of absence from group sessions, discharge from residential centers during the intervention, and occurrence of severe psychological problems from which the intended ones were not reported.

The intervention group participated in six emotional regulation training sessions based on the Gross model as a group in two sessions per week, with ninety minutes each session. In the first session, the therapist and the group members were introduced, the goals were elaborated on, and the importance of active participation as well as the rules for taking part in group sessions were explained. In the second session, the focus was on choosing situations, emotion-provoking situations, and explaining different kinds of emotions. The participants were asked to explain their emotional experiences based on situations, conditions, reactions, and behavior.

The contents of the third session taught how to evaluate the members' vulnerability level as well as their emotional skills; the fourth session was dedicated to introducing problem-solving strategies and teaching interpersonal skills. During the session, the participants practiced the intended skills by presenting scenarios and paired role-playing. The fifth session was about attention orientation, stopping obsessive rumination and anxiety, and in the last session, identifying wrong evaluations and their effects on emotional modes, teaching abreaction, relaxation, and reverse action were addressed. In this final session, after teaching skills, the participants practiced the presented techniques, and their trainers provided them with the necessary feedback. Generally, methods of role-playing and

presenting practice worksheets were used to encourage and enhance the participants' interaction. Additionally, at the beginning of each session, the participants were asked to voluntarily state the activities they accomplished in the interval of the two sessions. Moreover, a part of each session was dedicated to elaborating on ambiguities and answering the participants' questions.

The control group received only the MMT and teaching of technical skills presented by the rehabilitation center in the same period. In addition, in this study, to prevent transferring information between the two control and intervention groups, in the first phase, the importance of the study and devotion to keeping the individual's information confidential were explained to the participants in detail. Rubio's emotional adjustment measure was refilled one month after finishing the intervention by the participants of the two groups.

Data Collection Tools

Demographics Questionnaire: This questionnaire included the age, marital status, education level, smoking and alcohol consumption.

The Emotional Adjustment Measure: The emotional adjustment measure was designed by Rubio et al. (2007). This scale was developed to test people's emotional adaptation and includes 28 questions and two subscales: lack of manipulation of emotional arousal and physiology. The second subscale is disappointment and longing, although the participants answer each question from a six-degree spectrum of one (agree) to six (disagree). In this tool, questions 21, 25, and 28 are reverse scored. In general, the total score obtained from this questionnaire ranges from 28-167 [18]. Measuring the validity of this questionnaire was performed by Shokri et al. in Iran, where the internal consistency coefficients of the total factor and subscales were 0.84 to 0.91 [19].

Statistical Analysis

SPSS software, version 26, descriptive statistics (mean, standard deviation, number, and percentage), and inferential statistics (paired t test, independent t test, and chi-square) were used in this survey. The P value was determined to be <0.05 in all tests.

Ethical Considerations

Ethical considerations will be performed in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki). All the participants were informed about the study objectives and signed written informed consents for taking part in the study. Therefore, the present proposal has been approved with the code of IR.MUI.NUREMA.REC.1401.035 at ethics committee of the Isfahan University of medical sciences.

Results

Forty-eight male patients with SUD under MMT participated in the present study. Twenty-four participants were in the control group, and the other 24 were in the intervention group. According to the results of the study, the mean age of the participants was 39.62 ± 7.698 and the average time of abuse spent was estimated to be 19.11 ± 8.05 .

Most of the participants' characteristics included high school education (37.5%), single (47.95%), alcohol consumption (66.7%), smoking (100%), and crime record (64.6%). In general, according to the results obtained by the chi-square test and independent t test between the control and intervention groups from the perspective of demographic features, there was no significant difference ($p < 0.05$, Table 1 and 2)

The total emotional adaptation mean score was not significantly different between the two groups before the intervention ($p = 0.493$). After conducting the intervention, the total emotional adaptation mean score was significantly higher in the intervention group compared with the control group ($p = 0.012$, Table 3).

Additionally, there was a significant difference in the subscale of emotional arousal and physiology ($p < 0.01$) between the two control and intervention groups after the intervention.

While there was no significant difference between the two intervention and control groups in the subscale of disappointment and longing thought ($p = 0.549$, Table 4).

Table 1: Demographic information of individuals.

Demographic factors		group			p value
		Intervention	Control	Total	
		Number (%)			
Education	Primary education	6(25.0)	7(29.2)	13(27.1)	0.842
	High school	8(33.3)	10(41.7)	18(37.5)	
	Diploma	7(29.20)	5(20.80)	12(25.0)	
	University degree	3(12.5)	2(8.3)	5(10.4)	
Marital status	Single	10(41.7)	13(54.2)	23(47.9)	0.67
	Married	7(29.2)	6(25.0)	13(27.1)	
	Spouse deceased	7(29.2)	5(20.8)	12(25.0)	
smoking	Yes	24(100)	24(100)	48(100.0)	Cigarette is a constant.
	No	-	-	-	
alcohol consumption	Yes	15(62.5)	17(70.8)	32(66.7)	0.54
	No	9(37.5)	7(29.2)	16(33.3)	
History of substance abuse or alcohol in family members	Yes	13(54.2)	19(79.2)	32(66.7)	0.066
	No	11(45.8)	5(20.8)	16(33.3)	
History of psychiatric Disorder	No	14(58.3)	14(58.3)	28(58.3)	1
	Yes	10(41.7)	10(41.7)	20(41.7)	
History of committing a crime	No	11(45.8)	6(25.0)	17(35.4)	0.131
	Yes	13(54.2)	18(75.0)	31(64.6)	

Table 2: Quantitative characteristics of the participants.

Group	Intervention	Control	Total	t	p value
Statistic Variable	mean±SD	mean±SD	mean±SD		
Age	40.08± 8.34	39.16±7.148	39.62±7.69	0.409	0.685
Duration of use (years)	22.20±5.93	15.25±9.500	19.11±8.053	1.351	0.219

Table 3: Comparison of the mean difference in emotional adjustment scores in the two groups before and after the intervention.

Times		Before the intervention		After the intervention		paired sample test	
Groups		Mean	SD	Mean	SD	t	P value
Intervention		65.08	12.57	72.16	6.12	2.57	0.017
Control		68.58	21.4	64.2	13.33	-0.845	0.407
Independent Sample Test	t	-0.691		2.65			
	P value	0.493		0.012			

Table 4: Comparison of the mean emotional adjustment scores in the two groups before and after the intervention (independent samples test).

Subscale	Time	Group		t	P value
		Intervention	Control		
		Mean±SD	Mean±SD		
Lack of manipulating emotional arousal and physiology	before	29.29±6.77	31.16±11.46	-0.69	0.495
	after	35.20±3.96	28.08±8.23	3.819	0.001
disappointment and longing thought	before	35.79±6.41	37.41±10.49	-0.68	0.501
	after	36.95±3.59	36.12±5.72	0.604	0.549

Discussion

Based on the results of the study, no meaningful significant difference was reported between the two control and intervention groups before starting the intervention. Thus, we can say that the potential factors that can influence the treatment effectively are rather controlled and minimize the effect of the intervention. According to another set of results of the study, a meaningful difference was reported between the two control and intervention groups after applying the cognitive emotional regulation intervention to the emotional adaptation variable. As such, in the group receiving the emotional regulation intervention, the emotional adaptation score was markedly higher than that of the control group. In this regard, the results of the study by Zargar et al. revealed that emotional regulation treatment can highly affect the reduction of craving for drug use. It can also improve conjugal adaptation and emotional regulation in patients with SUD. Therefore, it can be used as a fruitful psychological treatment method in rehabilitation centers [20]. In addition, the results of another study conducted by Behrouian revealed that teaching emotional regulation using cognitive methods can considerably decrease anxiety, stress, and depression in caretakers of patients with schizophrenia [21]; these results are in line with those of the present study.

It also seems that the approach toward teaching emotional regulation has a positive effect on interactive styles and interpersonal relationships [22]. Thus, the results align with this study so well that they identify the effectiveness of emotional regulation skills in boosting adaptation levels and interpersonal agreement. Kobylińska, in his study, argues that reaching emotional self-regulation and emotional flexibility in specific situations facilitates conversations by reducing the authority of negative emotions and keeping peaceful;

it also supports mental health and long-term well-being [23]. The results of another survey showed that in subscales of lack of ordering emotional arousal and physiology, there was a meaningful difference between the two control and intervention groups after applying the intervention. In this respect, the outcomes of a longitudinal observational study on a large scale conducted to investigate the effect of emotional regulation ability on expressed emotions indicated that expressing emotions during the day for people who suppress their feelings has increased. For those who had stronger cognitive re-evaluating abilities, there was a more positive emotion expression, and as a result, the negative emotions increased less severely [24]. On the other hand, inefficiencies in using ordinary emotional regulation strategies may result in a lower level of positive feelings and an increase in negative feelings such as disappointment [25].

In the course of the sessions of this investigation, the therapist used techniques that increased the individuals' rate of using positive cognitive-emotional regulation strategies. Among these techniques were identifying positive and negative emotions, as well as the way to express them in different situations. These techniques lead to an increase in awareness in participants of their emotions and familiarize them with these feelings. On the other hand, they were trained on how to identify the sources of their stress and on how to administer them wisely, since environmental stresses can cause negative emotional states and therefore may enhance the tendency toward SUD in addicted individuals. Accordingly, the participants under MMT were able to manipulate their negative emotions by learning the principles of emotional recognition and applying more efficient methods, consequently improving their emotional adaptation level.

Moreover, following the results of the present study, the outcomes of a study by Miller showed that lack of emotional clarity predicted the greatest number of impulsive behaviors, whether in single cases or after controlling other forms of emotional regulation disorder. Not accepting emotions and problems in achieving goals when one is irritated is also related to several impulsive behaviors. Some difficulties of emotional regulation, particularly weak emotional clarity, may reveal certain mechanisms that cause adverse impulsive behaviors [26]. Cognitive emotional regulation refers to the person's ability to identify and manipulate emotions to control their thoughts and behaviors despite arousal for a specific action. In such situations, one may resist the temptation to struggle with unacceptable destructive behaviors by trying to manage this arousal [27]. Additionally, the study by Stellern et al. revealed that people with SUD have struggled the most in controlling impulsive behaviors and manipulating strategies to regulate their emotions effectively [8]. According to Alexander et al., regulating emotions refers to comprehending peoples' thoughts and judgments about their abilities to reach the intended aim. The higher the level of emotional regulation, the less the temptation for SUD [28]. Similarly, Davis et al. indicated that difficulty in emotional regulation leads to the inability to adjust the conditions of rehabilitation and facilitates returning to SUD among addicted people, which is a threat to mental and physical balance in people's lives [29].

On the other hand, one of the most remarkable deficiencies of emotional regulation in people is impulsivity and physiological reactions to emotion; this can also be considered an important issue compared to temptations for SUD [30]. A low level of emotional

arousal regulation can affect the level of turning back to SUD because people with SUD are not able to postpone pleasure and joy. In other words, people with SUD prefer the instant effects of abusing drugs that relieve their physical suffering to the advantages of rehabilitation [29]. Therefore, drug abuse, as an impulsive behavior, can be regarded as the result of disorder in emotional regulation and trouble in controlling impulses [31]. In people with SUD, there is a constant attempt to escape the unpleasant emotional states deep inside the mind [32]. All the mentioned results are in line with the outcomes of the present study; in other words, strengthening cognitive emotional regulation can remarkably influence the components of emotional arousal regulation and physiology [33].

The study results indicate that there was no significant difference in the subscale of disappointment and longing thought between the intervention and control groups after the intervention was carried out. Numerous psychological and biological factors can lead to feelings of hopelessness. A study conducted by Fanaj et al. has indicated that low self-esteem is directly related to reported feelings of hopelessness [34]. Furthermore, hopelessness, anhedonia, and dissociation are among the most prevalent psychopathological symptoms that can often lead to suicidal thoughts, attempts, and actions [35]. These challenges can significantly undermine the effectiveness of related treatments. Therefore, it is imperative to provide extensive treatment measures, including drug treatments under the supervision of a psychiatrist, for an extended period to overcome these issues. These findings indicate that the intervention program could be an effective way of improving emotional and physiological well-being, but further research may be needed to assess its impact on other aspects of mental health.

Conclusion

The results of this study indicate significant outcomes regarding the effect of educational interventions based on emotional regulation on emotional adaptation in people under MMT. The merits of training based on emotional regulation over traditional clinical treatments signal the need to expand such complementary treatments. Thus, using educational interventions based on emotional regulation is recommended as a complementary treatment program at rehabilitation centers. The research about the ways of presenting these services, particularly the way of applying educational interventions based on emotional regulation, should focus more on increasing adaptation as well as preserving and devotion to MMT and the relation between these factors; hence, for this purpose, the requisite interventions may be developed and introduced.

Limitations of the Study

One of the limitations of the present study was that it was conducted only on male participants due to the acceptance procedure at the intended rehabilitation center. Therefore, generalizing the results to similar communities containing both genders must be done with caution.

Acknowledgments

The authors highly appreciate all participants in the study for their cooperation in the research.

Data Availability

The datasets during the current study are not publicly available

due to confidentiality of the participant's data, but they will be available upon reasonable request.

The author from whom data can be accessed: Meysam Rezazadeh, Department of Adult Health Nursing, Faculty of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran.

Funding Statement

This study was financially supported by the Isfahan University of Medical Sciences. The funding agency played no role in the design of the study and in writing the manuscript.

Authors' Contributions

All authors contributed to the Conceptualization, Methodology, Writing Original draft, Visualization, Supervision, Writing-Reviewing and Editing.

References

1. Citaristi I. United Nations Office on Drugs and Crime—UNODC. In The Europa Directory of International Organizations. Routledge. 2022; 248-252.
2. Maldonado R, Calvé P, García-Blanco A, Domingo-Rodríguez L, Senabre E & Martín-García E. Vulnerability to addiction. *Neuropharmacology*. 2021; 186: 108466.
3. Rezaei Z, Vahed N, Rasuli-Azad M, Mousavi GA & Ghaderi A. Effect of dialectical behavior therapy on emotion regulation and distress tolerance in people under methadone therapy. *KAUMS Journal (FEYZ)*. 2019; 23: 52-60.
4. Gilson K-M, Bryant C & Judd F. Understanding older problem drinkers: the role of drinking to cope. *Addictive behaviors*. 2017; 64: 101-106.
5. Afrasiabifar A, Hasani P, Khoshkenab MF & Yaghamaei F. Models of adjustment to illness. *Advances in Nursing & Midwifery*. 2010; 19: 42-48.
6. Moradpoor J. Effectiveness of training self-awareness and assertiveness skills on self-esteem and compatibility of mothers of mentally retarded children. 2013.
7. Ahmadi Roghabadi A, Bagherzadeh Golmakani Z, Akbarzade M, Mansouri A & Khodabakhsh M. Comparison of the Effectiveness of Acceptance and Commitment Therapy and Metacognitive Therapy on Adaptive and Maladaptive Strategies of Cognitive Emotion Regulation in Patients with Substance Use Disorder undergoing Methadone Maintenance Treatment. *Research in Clinical Psychology and Counseling*. 2022; 12: 60-78.
8. Stellern J, Xiao KB, Grennell E, Sanches M, Gowin JL & Sloan ME. Emotion regulation in substance use disorders: A systematic review and meta-analysis. *Addiction*. 2023; 118: 30-47.
9. Etkin A, Büchel C & Gross JJ. The neural bases of emotion regulation. *Nature reviews neuroscience*. 2015; 16: 693-700.
10. Young KS, Sandman CF & Craske MG. Positive and negative emotion regulation in adolescence: links to anxiety and depression. *Brain sciences*. 2019; 9: 76.
11. Kraaij V & Garnefski N. The behavioral emotion regulation questionnaire: development, psychometric properties and relationships with emotional problems and the cognitive emotion regulation questionnaire. *Personality and Individual Differences*. 2019; 137: 56-61.
12. Farnam A & Mahmoodzahi S. The Relationship of Negative Emotions with Craving and Relapse Rate in Substance Dependent Subjects with Relapse: Mediating Role of Social Support. *Quarterly Social Psychology Research*. 2019; 9: 1-18.
13. Shabani H, Mirzaian B & Sangani A. Structural Equation Modeling of Schemas and Attachment Styles with Addiction Potential through the Mediation of Stress Coping Strategies, Cognitive Emotion Regulation, and Loneliness among the Addicts under Treatment. *Research on Addiction*. 2017; 11: 177-194.
14. Carr MM, Ellis JD, Saules KK & Ledgerwood DM. Childhood Adversity, Addiction Severity, and Comorbidity Among Patients Receiving Opioid Use Disorder Treatment: The Role of Emotion Regulation. *The Journal of Nervous and Mental Disease*. 2023; 211: 150-156.

15. Basharpour S & Ahmadi S. The Role of Self-Concealment and Alexithymia in Predicting Resistance to Change of Drug Users. *Military Caring Sciences*. 2019; 5: 312-320.
16. Garke MÅ, Isacson NH, Sörman K, Bjureberg J, Hellner C, Gratz KL, et al. Emotion dysregulation across levels of substance use. *Psychiatry Research*. 2021; 296: 113662.
17. Esmaeili A, Khodadadi M, Norozi E & Miri MR. Effectiveness of mindfulness-based cognitive group therapy on cognitive emotion regulation of patients under treatment with methadone. *Journal of Substance Use*. 2018; 23: 58-62.
18. Rubio VJ, Aguado D, Hontangas PM & Hernández JM. Psychometric properties of an emotional adjustment measure: An application of the graded response model. *European Journal of Psychological Assessment*. 2007; 23: 39-46.
19. Shokri O, Sanaeepur MH, Royaei Z & Gharetappey Z. Psychometric Properties of the Emotional Adjustment Measure among Iranian Students. *Quarterly of Educational Measurement*. 2016; 6: 77-97.
20. Zargar F, Bagheri N, Tarrahi MJ & Salehi M. Effectiveness of Emotion Regulation Group Therapy on Craving, Emotion Problems, and Marital Satisfaction in Patients with Substance Use Disorders: A Randomized Clinical Trial. *Iran J Psychiatry*. 2019; 14: 283-290.
21. Behrouian M, Ramezani T, Dehghan M, Sabahi A & Ebrahimnejad Zandi B. The Effect of Emotion Regulation Training on Stress, Anxiety, and Depression in Family Caregivers of Patients with Schizophrenia: A Randomized Controlled Trial. *Community Mental Health Journal*. 2020; 56: 1095-1102.
22. Arabi Z, Moghaddam LF & Sahebalzamani M. The effect of emotion regulation training on family relationships of hyperactive children. *J Educ Health Promot*. 2020; 9: 101.
23. Kobylńska D & Kusev P. Flexible emotion regulation: How situational demands and individual differences influence the effectiveness of regulatory strategies. *Frontiers in psychology*. 2019; 10: 72.
24. McDuff D, Jun E, Rowan K & Czerwinski M. Longitudinal observational evidence of the impact of emotion regulation strategies on affective expression. *IEEE Transactions on Affective Computing*. 2019; 12: 636-647.
25. Vanderlind WM, Millgram Y, Baskin-Sommers AR, Clark MS & Joormann J. Understanding positive emotion deficits in depression: From emotion preferences to emotion regulation. *Clinical Psychology Review*. 2020; 76: 101826.
26. Miller AE & Racine SE. Emotion regulation difficulties as common and unique predictors of impulsive behaviors in university students. *Journal of American College Health*. 2022; 70: 1387- 1395.
27. Walters KJ, Simons JS & Simons RM. Self-control demands and alcohol-related problems: Within-and between-person associations. *Psychology of Addictive Behaviors*. 2018; 32: 573.
28. Alexander AC, Hébert ET, Businelle MS & Kendzor DE. Everyday discrimination indirectly influences smoking cessation through post-quit self-efficacy. *Drug and alcohol dependence*. 2019; 198: 63-69.
29. Davis JP, Berry D, Dumas TM, Ritter E, Smith DC, Menard C, et al. Substance use outcomes for mindfulness-based relapse prevention are partially mediated by reductions in stress: Results from a randomized trial. *Journal of substance abuse treatment*. 2018; 91: 37-48.
30. Madanifard M, Namaei M & Jafarnia V. Comparison of cognitive emotional regulation and problem-solving strategies in substance abusers and normal subjects. 2016.
31. Azizi S, Maghsoudloo A & Baheshmat S. Comparison of coping strategies and emotion regulation tendencies among opium users, methadone maintenance treatment clients and normal individuals. *Journal of Research and Health*. 2019; 9: 533-543.
32. Gold AK, Stathopoulou G & Otto MW. Emotion regulation and motives for illicit drug use in opioid-dependent patients. *Cognitive behaviour therapy*. 2020; 49: 74-80.
33. Wu L, Winkler MH, Wieser MJ, Andreatta M, Li Y & Pauli P. Emotion regulation in heavy smokers: experiential, expressive and physiological consequences of cognitive reappraisal. *Frontiers in psychology*. 2015; 6: 1555.
34. Fanaj N, Melonashi E & Shkëmbi F. Self-esteem and hopelessness as predictors of emotional difficulties: A cross-sectional study among adolescents in Kosovo. *Procedia-Social and Behavioral Sciences*. 2015; 165: 222-233.
35. Pettorruso M, d'Andrea G, Martinotti G, Cocciolillo F, Miuli A, Di Muzio I, et al. Hopelessness, dissociative symptoms, and suicide risk in major depressive disorder: clinical and biological correlates. *Brain sciences*. 2020; 10: 519.