

Original Article

The Effectiveness of Emotion Regulation Therapy on Cognitive Disturbance, Function, and Difficulty in Emotion Regulation among Adolescents

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Received: 02 October 2022; Revised: 18 November 2022; Accepted: 01 November 2022

Abstract

Background and Aim: Due to the high prevalence of emotional and cognitive problems among adolescents, paying attention to the emotional and cognitive problems of this population seems to be a necessity of society. Lack of paying attention to these problems leads to the persistence of these disorders in adulthood, therefore, the present study was conducted to evaluate the effectiveness of ERT based on the Gross model on adolescents.

Materials and Methods: This study was a quasi-experimental research design involving 30 adolescents suffering from emotional problems. The used instruments included questionnaires of difficulty in emotion regulation, cognitive disturbance, and the Tower of London test. The assessment was performed in two stages including pre-test and post-test. SPSS-24 and one-way analysis of covariance were used to analyze the data.

Results: The results of one-way analysis of covariance showed that ERT was able to significantly improve the target variables of difficulty in emotion regulation, cognitive disturbance, and the Tower of London test.

Conclusion: It seems that using ERT based on the Gross model can improve the emotional problems of adolescents and prevent the occurrence of these problems among these people in adulthood.

Keywords: Emotional and cognitive problems, Adolescents, Emotion regulation

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Please cite this article as: Alimehdi M, Mohammadinia Z. The Effectiveness of Emotion Regulation Therapy on Cognitive Disturbance, Function, and Difficulty in Emotion Regulation among Adolescents. Int. J. Appl. Behav. Sci. 2022;9(4):9-16.

Introduction

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), anxiety and depressive disorders include a large range of emotional disorders and are among the

most prevalent types of psychiatric illnesses during adolescence. These disorders are the most common in adolescents (1). This population is strongly exposed to mental problems (2). The prevalence of emotional and behavioral problems among these people has been reported 13.7% to 50% (3) which is highly prevalent

among adolescents in school (4). Behavioral and emotional problems among children and adolescents are one of the parents' and mental health agents' concerns (5). Experiencing emotional problems, can significantly affect the quality of adolescents' functional performance in educational and social communication domains (6, 7). In fact, researchers believe that behavioral and emotional problems among children and adolescents anticipate and influence many aspects of their adulthood including family function, mental health, education, and careers (8). If emotional problems are left untreated, they might lead to emotional disorders during adulthood and could even become lifelong (9). Moreover, the findings of the recent studies reveal that there is a correlation between emotion and cognition (10) meaning that there has been a significant negative correlation between cognitive function and inability to describe emotions (11). In fact, the results show that the presence of emotional problems leads to decrease in cognitive abilities in different dimensions (12).

Some interventions such as cognitive behavioral therapy, meta-diagnostics of mindfulness, and acceptance and commitment therapy have designed to treat psychological problems in adolescents (9, 13, 14). On the other hand, the results of many types of research have shown that the difficulty in regulating emotions is a main problem in the adolescent population (6). Difficulty in regulating emotion is related to some problems including psychological injuries, social problems, and even physical diseases. Emotion regulation pertains to those methods in which people experience and express their emotions (15). Reviews claim that 50% of psychological disorders and about 100% of personality disorders have a flaw in emotion regulation (1). The findings of these studies have been confirmed through both the clinical and non-clinical populations especially through the latter one (1). For this reason, various treatments such as meta-diagnostic therapy, mindfulness therapy, and acceptance & commitment therapy have been formed based on the emotion regulation theory (16, 17,18). Their results are expressive of the effectiveness of these approaches in the time of psychological problems therapy (19, 20). There are some theories in terms of regulating emotions. One of these significant theories is the model of the Gross examination.

According to Gross, regulating emotion happens in five stages which are described as follows: Start, situation, attention, assessment, and response. Furthermore, according to this claim, there are two strategies for regulating emotions which compose appeasement and reassessment. The findings of researches have pointed out that the people who use less appeasement experience more negative and less positive emotions and they meet more and deeper symptoms of psychological injuries (21, 22). Nevertheless, reassessment strategy has a relationship with mental health, meaning that the people who utilize this strategy more than using appeasement possess more mental health (23). Despite the high prevalence of emotional problems in the adolescent population in Iran, the main focus is still on the treatment of the adult population. Also, despite the efficiency of this model in therapies that use this component, no study has been conducted so far to investigate the effectiveness of the Gross model among adolescents. Thus, the current research aims to investigate the effectiveness of ERT based on the Gross model among adolescents as a non-clinical population.

Methods

This study was a randomized double-blind trial in which one group received emotion regulation therapy (ERT) and the other group had wait control list (Ethics code: IR.IAU.TMU.REC.1400.021). The assessment occurred within two stages of pre-test and post-test. Before the intervention, the participants' parents filled out an informed consent form consciously. The control group didn't receive any intervention, but the experimental group received emotion regulation therapy based on the Gross model. The assessment was accomplished one day before intervention and one day after its finish. Before starting the intervention, the experimental group was investigated using children and adolescence diagnostic interviews. Afterward, the adolescents who had psychological disorders were chosen to be studied. Table 1 offers the frequency of clinical disorders.

The diagnostic interview was done by a student with master's degree of psychology under the supervision of a psychiatrist, the assessment was done by an M.A student who was not aware of the research objective,

and the therapy was accomplished by an M.A student who had gained enough training in terms of emotion regulation therapy in a relevant workshop under the supervision of one of the faculty members who were competent in this approach. During the intervention, the supervisor observed the M.A student via a one-sided mirror. The patients' disorders were in the ranges of emotional disorders. The inclusion criteria in this research included age ranging from 12 to 18, having the literacy of reading and writing, lack of suffering from a severe psychological illness, parents' lack of suffering from severe psychological illness, absence of receiving other psychotherapy interventions or medication at the same time, not having addiction, and no more than two absences in psychotherapy sessions.

The participants of the current study include all the middle and high school students of region 5 in Tehran province in 1399-1400 who visited therapy centers for psychological disorders. After informing the students via social media, 35 of the middle school students agreed on participating in the research. Some of the participants were dropped out from the study because of having acute psychiatric problems (two participants), receiving other psychological interventions at the same time (another two

participants), and drug abuse (one participant). Therefore, 30 students were investigated of whom 15 were entered the experimental group randomly and the rest 15 were entered the control group.

Intervention was accomplished using emotion regulation therapy based on the Gross model. The content of each session is reported in the Table 2.

The participants were aware of the research condition and written consent was received from them and their parents. Moreover, the participants possessed the freedom to quit participation whenever they want. Collected data was confidential in all stages and the findings were shared with those participants who wished to know about the result. Finally, after clarifying the findings and the efficiency of intervention for the experimental group, the intervention was run.

Table 1:Prevalence of psychological disorders among the patients.

Diagnosis	Principle diagnosis (%)
Generalized Anxiety Disorder (DAD)	5 (16.67)
Social phobia	4 (13.33)
Major Depressive disorder	2 (6.66)
Obsessive-compulsive disorder	2 (6.66)
Post-traumatic stress disorder	3 (10.00)
Anxiety disorder, NOS	3 (10.00)
Panic disorder	3 (10.00)
Separation anxiety disorder	2 (6.66)
Specific phobia	3 (10.00)
Dysthymic disorder	1 (3.33)
Attention-deficit/Hyperactivity disorder	2 (6.66)

Materials

Emotion Regulation Questionnaire

This scale is a comprehensive instrument for investigating difficulty in regulating emotion according to the conceptualization of emotion regulation based on mindfulness and acceptance which has been designed in 2004. DERS is a 36 self-report Likert-scale item ranging from *Never (1)* to *Almost always (5)* that investigates usual levels of

difficulty in emotion regulation and its special dimensions. The total score of the questionnaire is up to 180 without cutting score and the highest scores show the problem in regulating emotion. This scale is sensitive towards change in therapy duration (even the short-term therapy) and the findings report that the current scale is a helpful instrument for change of difficulty in emotion regulation because of the therapies that are based on mindfulness and recognizing mechanisms of therapy change. Aspects of scales

Table 2: The content of training sessions for strategies of emotion regulation based on the Gross model.

Sessions	Stages	Session content
1		Expressing rationale and intervention stages, why these skills should be learned, appropriate perspectives about emotions, reviewing primary and secondary emotions, all emotions help us.
2	situation selection	Presenting emotional training: recognizing emotions and arousing situations via training of different emotion functions, information about various aspects of emotions and their short-term and long-term effects.
3	situation selection	Evaluating the level of vulnerability and emotional skills among the members: the function of emotions in the process of human accommodation and their advantages, the role of emotions in communicating with others and influencing others.
4	situation modification	Causing change in situations of arousing emotions: preventing social distances and avoidance, training problem-solving strategy, training interpersonal skills.
5	attention deployment	Change in attention: stop rumination, training attention, and methods of concentrating on the situation along with positive and negative responses of the situation.
6	cognitive assessment	Change of cognitive assessment: recognizing incorrect assessments and their influences on emotional moods, training reassessment strategies and renewed attention to the situation from different aspects.
7	response modification	Changing behavioral consequences and emotion physiology: recognizing the level and ways of avoidance strategy and investigating emotional consequences, encountering, training expressing excitement, modifying behavior via environmental amplifiers, emotional relief training, relaxation, and reverse action.
8	function evaluation	Reassessment and eliminating functional obstacles: evaluating meeting individual and group objectives, application of trained skills in normal places out of the session, investigation and removing obstacles of doing assignments
9 & 10		Reviewing the sessions and practicing trained skills

include not acceptance of emotional responses, difficulty in doing purposeful actions, difficulty in impulse control disorders, absence of emotional awareness, limited access to emotion regulation strategies, and not having emotional transparency. The responses of the questionnaire are scored based on the five-point Likert-scales but for the items of 1, 2, 3, 6, 7, 8, 10, 17, 20, 22, 24, 34 scores are reversed. The total reliability coefficient of the main scale was 93% and 88% for the retest. Moreover, structural validity and appropriate prediction have been reported (24). This scale has been normalized and translated into Persian by Khanzadeh et al. Their report of the subscales of the questionnaire credibility via Cronbach's alpha ranging from 66% to 88%, with retest method of 91% to 97%, and structural validity and appropriate criteria show the acceptable reliability and validity of the Persian version of the questionnaire (25).

Tower of London Test

This test is one of the most important instruments that measure executive function, scheduling, organizing, and problem-solving. This test is sensitive to the frontal lobe. The investigated variables in this test include the time of examination, delay in the examination, the whole time, result, error, time of reaction, and response intervention. This examination possesses good structural validity in assessing planning and solving the problem of the patient. Further, the validity of this test is acceptable and reported .73 (26).

Cognitive Disturbance Questionnaire

This questionnaire has been designed by Mason et al. and includes 14 yes/no questions. *Yes* and *no* are scored 1 and 0 respectively. The total score ranges from 0 to 14. Scores 0 to 5 show low disturbance, scores 5 to 7 report medium disturbance, and scores higher than 7 reveal high cognitive disturbance (27). In normalization of the current questionnaire in Iran the validity was .89 and the reliability of this test was checked via retesting with the result of 0.75 (28).

For analyzing the data, SPSS 24 was used. Descriptive indicators of mean and standard deviation (SD), inferential tests, Leon exams, independent T-test, Chi-Square test, Kolmogorov-Smirnov test, MBOX test, and one-way analysis of covariance (ANCOVA) were applied.

Results

The subjects were both males and females. Their age ranging from 11 to 15 years. Two of the subjects in control group and one of subject in intervention group were dropped out during therapy. Descriptive data are shown in table 3.

Before performing the analysis of Covariance, the assumptions of homogeneity of variance and normality of the data were checked to make sure of the test for analyzing the data. Leon test findings reported the homogeneity of variance for the variables of cognitive disturbance ($f = .433$, $\text{sig} = .511$), cognitive function ($f = 1.075$, $\text{sig} = .309$), and emotion regulation ($f = 3.647$,

Table 3:Demographic information of the participants.

Variable		Experimental group	Control group (s)
Age		12.73	13.26
Gender	Female	8 (53.33)	7 (46.66)
	Male	7 (46.66)	8 (53.33)
education	First grade of secondary school	7 (46.66)	6 (40.00)
	Second grade of secondary school	4 (26.66)	5 (33.33)
	Third grade of secondary school	4 (26.66)	4 (26.66)

sig = .066). Furthermore, results of regression slope test reported that data slopes of cognitive disturbance ($F(1, 26) = .590$, sig= .450), cognitive function ($F(1, 26) = .1436$, sig= .242), and emotion regulation ($F(1, 26) = 22.751$, sig= .486) are the same.

Table 4 reveals a univariate analysis of covariance that reports that there is a significant difference between the two groups in terms of triple indicators of emotion regulation, cognitive function, and cognitive disturbance.

Therefore, the score of emotion regulation of the experimental group in the pre-test was much better than the score of wait list control group. Thus, it can be concluded that the self-help program results in significantly improving emotion regulation, cognitive function, and cognitive disturbance for the experimental group. The observed effect size for high cognitive disturbance, emotion regulation, and cognitive function were medium.

Discussion

The current study aimed at investigating the effectiveness of the therapy based on emotion regulation of the Gross model on the psychological problems of adolescents who suffered from emotional disorders. The findings claimed that this therapy helped improvement in emotion regulation, cognitive function, and cognitive disturbance among the patients. These findings of improvement of the patients with emotional problems are in the same line

regulation influenced improvement among adolescents who suffered from emotional problems (9). In explaining this finding, it can be said that one of the problems of patients with emotional disorders is not facing negative emotions and avoiding these emotions. But in emotion regulation therapy, patients are encouraged to face these negative emotions and accept them. This acceptance makes them better at managing their emotions and using them (23). Also, it can be concluded that in this approach presenting appropriate information about emotions, effective role, and correct use of them rather than repressing them arouse the person to manage his/her emotions properly. Different studies indicate that although the people who use repression can suppress their emotions efficiently, they experience more negative emotions in comparison with those who do not repress their feelings (29). Even though both reassessment and repression decrease the expressive component and external appearance of emotion, only the reassessment decreases the experimental component of emotion that results in not experiencing the emotions negatively and annoyingly (16). The other finding of the current research was that the therapy based on emotion regulation can improve cognitive function significantly among adolescents which again is similar to other research that reported improvement of cognitive function as the result of therapy based on emotion regulation (24). Suffering from emotional problems leads to the destruction of cognitive function. Therefore, one of the best ways to improve cognitive performance is to reduce the level of emotional problems (12). In emotion regulation therapy

Table 4: Mean, standard deviation (SD), effect size, and covariance test result to compare the two groups before and after intervention.

	Experimental group		Wait list control group		P-value	(Effect size) <i>d</i>
	Mean of pre-test (SD)	Mean of post-test (SD)	Mean of pre-test (SD)	Mean of post-test (SD)		
Cognitive disturbance	8.13(1.59)	4.6(1.50)	6.87(1.81)	7.53 (1.7)	0/001	0.79
Cognitive function	15.80(2.96)	19.27 (2.40)	17.47(2.67)	(2/48) 17.8	0.001	0.61
Emotion regulation	101.13(17.71)	71.80(16.23)	96.93(16.98)	93.07 (16.94)	0.001	0.66

with those studies in which therapy based on emotion

by training on how to manage emotions such as anxiety,

depression, and stress prevents the destruction of cognitive skills. By strengthening cognitive reassessment of emotion regulation, this treatment prevents destructive emotional reactions and improves the subject's cognitive performance skills. In fact, the people who used suppression to control their negative emotions performed poorly in the cognitive function test. On the other hand, the people who used reassessment to control their negative feeling, their cognitive function did not get weakened as a consequence of emotional dysregulation. Also, one of the problems that cause the deterioration of cognitive function in patients with emotional problems is lack of attention. Because the focus of these people is usually on past events or related to future events. But in the emotion regulation approach, one of the important techniques for improving attention is the technique of strengthening attention. In this technique, by presenting exercises to the patient, she shifts her focus to the present (23).

Conclusion

It can be concluded that emotion regulation therapy can be used as an approach to improve emotional and cognitive problems in adolescents with emotional disorders.

Acknowledgment

None.

Conflict of Interest

The authors declare that they have no conflict of interest.

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