



## The effectiveness of cognitive-behavioral therapy (CBT) on rumination in self-harming adolescents without suicidal intent

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### ARTICLE INFORMATION

### ABSTRACT

#### Article type

Original research

Pages: 119-125

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#### Article history:

Received: 2022/02/04

Revised: 2023/04/05

Accepted: 2023/04/25

Published online: 2023/06/10

#### Keywords:

*cognitive-behavioral therapy, rumination, self-harm.*

**Background and Aim:** Self-harm with non-suicidal intent is a conscious behavior in which a person damages her own body tissues and can have many consequences. The purpose of this study was to investigate the effectiveness of cognitive-behavioral therapy (CBT) on the rumination of self-harming adolescents without suicidal intent. **Methods:** The research method was quasi-experimental with a pre-test and post-test design with a control group. The statistical population of the present study included 16-18-year-old students (boys and girls) of high schools in Sari city. From this population, 100 people were selected by available sampling method, and among them 28 people who had obtained the highest scores in the non-suicidal self-injury questionnaire (NNSI), following the entry criteria, were selected in a simple random manner in a group. An experimental and a control group (each group includes 14 people) were appointed. The experimental group received cognitive-behavioral therapy in a group method during 12 90-minute sessions, and the control group did not receive any intervention until the post-test. The tools used in this research included the non-suicidal self-injury questionnaire (Klonsky and Glenn, 2011) and Nolen Hoeksma's rumination questionnaire (1991). The data obtained in the two stages of pre-test and post-test were analyzed using SPSS-22 software by analysis of covariance. **Results:** The results showed that cognitive-behavioral therapy has led to a reduction in rumination. **Conclusion:** The results of the research provide evidence that cognitive-behavioral therapy is a suitable method for reducing rumination in self-harming adolescents without suicidal intent and can lead to the improvement of their mental health.



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#### How to Cite This Article:

Mirzaian, N., Vafaeinejad, Z., Zamanpour, Z., Shabannejad, A., & Abbasian, A. (2023). The effectiveness of cognitive-behavioral therapy (CBT) on rumination in self-harming adolescents without suicidal intent. *jayps*, 4(3): 119-125.

## Introduction

According to the latest Diagnostic and Statistical Manual of Mental Disorders, non-suicidal self-injury (NSSI) is defined as "deliberate self-injury applied to the surface of a person's body." It causes bleeding, bruising, or pain (such as cutting, burning, tapping, hitting, excessive rubbing). Such harm is expected to result in only minor or moderate physical harm (ie, no suicidal attempt)" (American Psychiatric Association, 2013). According to the International Society for the Study of Self-Injury (2007), self-injury with non-suicidal intent is a conscious behavior in which a person damages his own body tissues, such as cutting and burning the body, but this behavior is not done with the intention of suicide. It is not socially and culturally acceptable and it is not done with the aim of implementing social rules and customs.

This behavior has become a major public health concern. In a meta-analysis of the prevalence of self-harm among non-clinical samples, it was shown that 17.2% of adolescents, 13.4% of adolescents and 5.5% of adults commit self-harm. This rate is higher among clinical samples of adolescents (45%-30%) and adults (21%) (Swannell, Martin, Page, Hosking, & John, 2015). In Iran, in the study of self-injury behaviors using Gratz's intentional self-injury questionnaire (2001), the prevalence of this behavior in 350 adolescent girls in the second and third grades of high school in Tehran was reported to be 12% (Peyvastegar, 2013). According to the results of this study, 38 people (12%) used the method of cutting body parts at least once and 16 people (4%) more than once to harm themselves. 58 people (17%) had used needles to self-harm at least once and 36 people (11%) more than once. In this study, inserting a needle into the skin for the purpose of tattooing, ear or nose piercing was also considered as intentional self-harm. For other self-injurious behaviors in this study, according to Faroni, it was: Carving pictures and writing on the skin, preventing the healing of wounds, beating, washing hands with cleanser until the skin is damaged, pulling hair, burning the body, bruising a part of the body (pinching), biting nails and dripping acid on the skin.

One of the underlying psychopathological mechanisms of depression is rumination. Rumination is generally defined as negative repetitive thoughts about personal concerns or

the meanings and causes of negative moods (Nolen-Hoeksma, Wisko, & Lyubomirski, 2008). Rumination causes harm such as strong negative emotions, depressive symptoms, negative thinking, poor problem solving, disturbed concentration and cognition, and more psychological stress. By maintaining attention on negative content and postponing active and effective coping, it causes deeper depression (Papajogirou & Wells, 2004). In various studies, the role of rumination in the onset and continuation of depression has been confirmed. According to Watkins, researches and clinical experiences show that rumination is a key factor in the conceptualization of depression, which is often neglected (Nolen-Hoeksma, 1991).

In recent years, rumination has been increasingly recognized as an important component in depression (Watkins & Berccia, 2001). Rumination is defined as persistent and recurring thoughts about a topic. These thoughts involuntarily enter the consciousness and divert attention from the desired topics and current goals (Jorman, 2006). In mild or severe depressive states, a person ruminates on negative topics (Watkins & Molds, 2005). Rumination causes abnormalities in the underlying cognitive structure of depressed patients and is related to psychological maladjustment and increased negative emotions such as anger and stress (Wenzelf & Wenner, 2000).

Rumination is a transdiagnostic factor that has a causal and perpetuating role not only in depression but also in other disorders such as anxiety and overeating and substance abuse (Nolen Hoeksma, 1991). Therefore, choosing rumination as the main goal of treatment can not only reduce depression, but also improve the symptoms of the accompanying disorder if there is a co-occurring disorder. Clinical experience and a lot of research literature indicate that many patients referred for depression treatment suffer from several disorders, which are diagnosed as one or two coexisting disorders. For the therapist, one of the most important and difficult treatment decisions is which disorder to treat first.

Research indicates that there are few psychological treatments specifically for self-harm (Washburn et al., 2012). A recent review found that there are no well-proven treatments for self-injury (Glenn, Franklin, & Nock, 2015). A review of the research literature on effective treatments for non-suicidal self-harm shows that

the following treatments have been used the most: dialectical behavior therapy (Mehlom et al., 2014; McCulley et al., 2018); cognitive behavioral therapy (Slee et al., 2008); acceptance-based behavioral therapy (Borberg et al., 2018); Mindfulness-based therapy (Razo & Fonagy, 2012). The current research seeks to answer the question of whether cognitive behavioral therapy is effective on the rumination of self-harming teenagers without suicidal intent.

### Method

According to its purpose, this research was applied research, and in terms of data collection method, it was a cross-sectional and semi-experimental method with a pre-test and post-test design with a group of witnesses. The statistical population of the present study included 16-18-year-old students (boys and girls) of high schools in Sari city. From this community, 100 people were selected by available sampling method. Among them, 28 people who had obtained the highest scores in the non-suicidal self-injury questionnaire (NNSI) were randomly assigned to an experimental group and a control group. The experimental group underwent cognitive-behavioral therapy in 12 sessions (90 minutes each session). The conditions for entering the sample are: People with self-harming behaviors, age range between 16 and 18 years; completion of the informed consent agreement regarding participation in the research project; not taking neuropsychiatric drugs during the last three months and during the intervention; Not suffering from an incurable physical disease such as cancer, such as; Not suffering from a serious psychiatric disorder such as severe conduct disorder, major depressive disorder with the risk of suicide, psychotic disorder and the like; That they are not subjected to treatment or other psychological interventions during the implementation of the research. The conditions for leaving the sample group were: Absence of more than two sessions in treatment; It is clear that he has taken psychoactive drugs or drugs during the last three months; suffering from mania or a psychotic disorder; The lack of inclusion criteria led to the exclusion of the research.

### Materials

**1. Non-Suicidal Self-Injury Questionnaire (NSSI):** The Non-Suicidal Self-Injury Questionnaire is a self-report tool developed by Klonsky and Glenn (2011) and evaluates the frequency and performance of non-suicidal self-injurious behaviors (NSSI). This list has two parts: The first part of the questionnaire is the frequency of 12 different types of self-harming behaviors that are done intentionally (knowingly) but not with suicidal intent. It screens for hitting, biting, burning, tattooing, cutting, wound manipulation, self-pinching, picking, rubbing the skin against rough surfaces, severe itching, sticking needles in the body, and ingesting hazardous chemicals. The questionnaire

evaluates some descriptive characteristics of non-suicidal harmful behaviors such as: the date of the first act and the date of the most recent act of self-harm. The retest reliability of this part has been obtained in the period of 1 to 4 weeks,  $r=0.85$ . Internal consistency between test questions was obtained using Cronbach's alpha method of 0.84 (Klonsky & Glenn, 2009). The second part of the questionnaire evaluates the performance of non-suicidal self-injurious behaviors. This section assesses the performance of 13 self-injurious behaviors that have been validated in both empirical and theoretical studies (Chapman, Grantz, & Brown, 2006; Klonsky, 2007). These 13 functions are classified under two general factors: Intrapersonal functions (emotional regulation, anti-dissociation, anti-suicide, distress and self-punishment); Interpersonal functions (independence, interpersonal privacy, interpersonal influence, dependence on peers, revenge, self-care, thrill-seeking and stubbornness). The options are compiled in the form of a three-point Likert, which is graded from 0 (completely unrelated), 1 (somewhat related) and 2 (completely related). Therefore, each subscale is scored from 0 to 6. Also, the average score of the overall scales is obtained from the sum of the scores of the subscales and their number. High scores indicate the existence of a problem in that area and low scores indicate the absence of a problem in that area. The functional part of the list has high construct validity (Klonsky and Glenn, 2009). This part of the list shows high internal consistency in follow-up studies (Cronbach's alpha of intrapersonal functioning 0.89 and interpersonal functioning 0.75). This list has not been used in internal studies so far. In the present study, Cronbach's alpha of intrapersonal function was 0.83 and interpersonal function was 0.77.

**2. Rumination Questionnaire:** Nolen Hoeksma and Maur (1991) developed a self-test questionnaire that evaluated four different types of reaction to negative mood. The Response Styles Questionnaire (RSQ) consists of two ruminative responses scales (RRS) and distracting responses scales (DRS). Rumination answers have 22 words. This questionnaire was investigated in Iran by Mansouri in 2012 (Lament, 2004). Based on empirical evidence, rumination scales have high internal reliability. Cronbach's alpha coefficient is in the range of 0.88 to 0.92. Various studies show that the test-retest correlation for the scale of rumination responses is 0.67. Cronbach's alpha was 0.90 in Mansoori's research. The predictive validity of rumination responses scale has been tested in a large number of studies. The results of many studies show that the scale of rumination responses can predict the severity of depression in follow-up periods in clinical and non-clinical samples by controlling variables such as the initial level of depression or stressful factors (Mansoori, 2010). This questionnaire has 22 statements, each of which is graded on a scale from never (1) to most of the time

(4). To get the total score of the questionnaire, we add the total scores of all the questions together. The total score will range from 22 to 88. The higher the score, the higher the intensity of rumination and vice versa.

**3. Cognitive-behavioral therapy:** Cognitive-behavioral therapy Cognitive-behavioral therapy is an active, directional, limited, and time-organized approach, according to which a person's emotions and behavior are mainly determined by his construction of his world, and it has been particularly effective in the treatment of depression; This treatment improves depression by focusing on dysfunctional thoughts and beliefs that have caused and maintained depression. The use of cognitive-behavioral therapies includes the following different methods: Relaxation (muscular and respiratory), cognitive restructuring, biofeedback, regular desensitization, behavioral training, thought-

stopping, and risk-learning, have been suggested by many researchers as one of the methods of dealing with psychological problems during medical treatments (Houghton Keith et al., 1997). The basis of interventions in group cognitive behavioral therapy is emphasizing the principles of the cognitive behavioral therapy school and simultaneously considering the factors of the group process (Billing, McCobb, and Anthony, 2013). Cognitive behavioral therapy is one of the types of psychotherapies that is very valid from the point of view of experience. The results of 350 studies conducted in this field show the effectiveness of this treatment method in the treatment of psychiatric disorders such as depression, anxiety disorders, personality disorders and psychosis (Billing & Quicken, 2003).

**Table 1. Brief description of cognitive-behavioral therapy sessions**

Session	Content
1	Establishing communication with group members, explaining group rules, teaching about depression and mental rumination, self-harm behavior, familiarizing participants with the cognitive components of emotional reactions, identifying primary superficial thoughts placed between the event and emotional reaction.
2	Getting to know the cognitive behavioral model
3	Activity independence, mastery - pleasure and activation of the patient: Familiarity with the relationship between depressed mood and lack of activity, behavioral activation training
4 & 5	Targeting and getting to know the types of creation
6	Recognizing negative thoughts in the emergence and aggravation of depression, getting to know spontaneous thoughts
7 & 8	Getting to know cognitive distortions and identifying them in your thinking and challenging them
9 & 10	Cognitive restructuring: identification of negative beliefs, vertical downward arrow technique, challenge training with negative beliefs
11 & 12	Relapse prevention: Examining participants' plans to maintain treatment goals and posttest performance

### Implementation

In order to implement the educational package, firstly, through interviews with academic experts and professors, in order to get their views and ideas in each of the stages of the research work. After receiving feedback and approval, finally, in the operational field, according to the non-random (targeted) sampling method, 28 self-harming teenagers without suicidal intent were selected and clinical interviews were conducted. At first, preliminary explanations about the purpose of the project, the number of sessions and the content of the training, the way of cooperation and completing the questionnaire were given to the participating teenagers. After obtaining written informed consent from them regarding the implementation of the project, Nolen Hoeksma rumination pre-test was received from both groups in the first session. Then, twelve sessions of cognitive-

behavioral therapy were performed on the experimental group, in a group manner, twice a week, and during this period, the control group was not subjected to any intervention. Finally, after completing the treatment sessions on the experimental group, rumination questionnaire was administered again on both groups. Also, in order to comply with the principles of professional ethics, the control group is considered as the waiting list group, and the therapists were required to provide them with the desired treatment (CBT) after the end of the research, and it was done.

### Results

The participants of the experimental group (cognitive-behavioral therapy) were studying in high school (10th, 11th and 12th grades). 55 participants were girls and 45 were boys.

Table 2. Descriptive indices of research variables after and before cognitive-behavioral therapy

Variable	Group	Pre-test		Post-test	
		Mean	SD	Mean	SD
Rumination	Exp.	63/60	6/85	48/11	9/27
	Control	66/39	8/12	56/30	7/40

As Table 2 shows, the mean and deviation of rumination and stress tolerance in self-harming teenagers after cognitive-behavioral therapy is better than before cognitive-behavioral therapy. In order to test the hypotheses of the research, the average scores of the pre-test and post-test of the two experimental and control groups were analyzed through covariance analysis. Before performing analysis of covariance (ANCOVA), the assumptions of normality of distribution of variables were checked. The assumption of the relationship between auxiliary random variables and the dependent variable, the assumption of equality of variance, the existence of the assumption of homogeneity of slopes (regression) were investigated. The results of the Kolmogorov-Smirnov test showed that the probability levels (P value) in all research

variables are greater than the error level of 0.05. Considering the value of P and not rejecting the null hypothesis, the data distribution is considered to be normal distribution. As a result, parametric tests have been used to test research hypotheses. The results of Lone variance homogeneity test for rumination in self-harming teenagers are not significant. These findings allow the researcher to assume that the variance of the two groups in the dependent variables are equal. The non-significance of the interaction effect shows that the data supports the hypothesis of homogeneity of the regression slopes. Therefore, covariance is performed only to test the effects of the main post-test and group variables. That is, whether the community averages are the same in the experimental and control groups.

Table 3. Covariance analysis test results

	SS	Df	MS	F	Sig.	Eta square
Group	329/193	1	329/193	5/782	0/023	0/176
Error	2723/989	27	100/888			
Total	75323/000	30				

According to Table 3, the difference of rumination in two groups is significant ( $F=5.782$ ;  $df=1,27$ ;  $P=0.023$ ). In other words, cognitive-behavioral therapy has an effect on reducing rumination in self-harming teenagers.

**Conclusion**

The present study was conducted with the aim of investigating the effectiveness of cognitive-behavioral therapy on the rumination of self-harming teenagers. It was found that the group of 16-18-year-old children who received cognitive behavioral therapy showed a significant change in the amount of rumination compared to children who did not receive this treatment. This finding is consistent with the mentioned researches. Kells and Eadows (2018) found that cognitive behavioral therapy is effective in reducing depression symptoms

during a research on depressed people. In the research of Lee et al. (2018), which was conducted with the meta-analysis method, the results showed that cognitive behavioral therapy is a very efficient method in the treatment of depression. Spinfon et al. (2018) in a study that they conducted with the meta-analysis method, after reviewing 36 studies regarding the effectiveness of various therapeutic interventions on rumination, stated that cognitive behavioral therapy is an effective treatment in reducing rumination. The results of Hawley et al.'s research (2017) showed that training various cognitive behavioral therapy skills, such as behavioral activation and cognitive restructuring, has an effect in reducing depression symptoms. In

explaining this finding, it can be said that cognitive behavioral therapy using activity planning strategies makes people do enjoyable activities, and the implementation of activities changes their positive attitude and mood. On the other hand, this method helps people to change their negative thoughts about the causes and meanings of feelings and symptoms and feel better by recognizing inefficient thoughts and challenging cognitive errors and correcting negative beliefs about themselves and others and the future. Cognitive behavioral therapy helps adolescents modify negative and unhelpful thoughts, feelings, and behaviors resulting from traumatic experiences. It seems that the set of cognitive and behavioral factors can open a new window of cognitive and emotional possibilities and capacities to regulate emotion in front of self-harming teenagers.

#### Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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