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Effectiveness of Cognitive Restructuring on Rumination in Girls with Self-Harm

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ABSTRACT

Objective: The purpose of this study was to investigate the effectiveness of cognitive restructuring training on the rumination of adolescent girls suffering from self-harm.

Methods: The semi-experimental research method was pre-test-post-test and follow-up with a control group. The statistical population of this research was all female students suffering from self-injury, age range 15-18 years old in Baharestan schools in 2023. The number of 54 people who had self-harm in the last 6 months and had visited the counseling clinics were selected, and they were randomly assigned to the experimental and control groups by accessible sampling method. The research tools included the rumination scale (Nolen-Hoeksma and Maro, 1991) and ISAS self-injury test. The subjects of the experimental group underwent eight 90-minute sessions of cognitive restructuring training, and the control group did not receive any intervention, and a follow-up was done after one month. Multivariate covariance analysis was used to analyze the data.

Results: After examining the assumptions of multivariate covariance analysis, the test results showed that there is a significant difference between rumination of two groups ($p<0.01$), also the effect size shows that group membership accounts for 36.4% of the changes in ego-centered rumination explains 39.5% of symptom-oriented rumination changes and 29.9% of antecedent/consequence-oriented rumination changes.

Conclusions: According to these findings, it can be concluded that cognitive rehabilitation is effective and has reduced the rumination of girls suffering from self-injury.

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Introduction

Adolescence, a developmental phase characterized by significant transformations encompassing physical, social, and emotional dimensions, introduces a plethora of potential challenges and hurdles within the psychological and biological framework of the adolescent. The susceptibility of adolescents to psychological adversities such as self-harm and suicide can be attributed to their cognitive immaturity compared to other age cohorts, necessitating thorough exploration of the factors intertwined with this phenomenon in contemporary research studies ((Akbari-Motlaq et al., 2023). The incidence of various forms of self-injurious behavior during adolescence surpasses that observed in other life stages, as evidenced by a study indicating a surge in non-suicidal self-harm rates from 4% in 2002 to approximately 16% in 2017 (Tørmoen et al., 2020). Statistical data suggests a peak in self-harm cases among females aged between 16 and 24, with the prevalence escalating from 6% in 2002 within this specific demographic to 19% in 2014 (Tørmoen et al., 2020). Adolescents exhibit a higher vulnerability to engaging in self-harm compared to individuals in other age brackets, with recent trends highlighting a surge in non-suicidal self-injury cases over the past decade (Dolle et al., 2012; Vafaei et al., 2023). The prevalence of self-harm behaviors among Iranian teenagers is estimated to range between 13% and 22%, signifying the profound psychological and societal repercussions associated with such actions. Often concealed and challenging to discern, self-harm persists over extended durations, serving as a coping mechanism in response to life stressors due to its intricate psychological functions (Schneider et al., 2018). Prolonged engagement in self-harm activities may escalate to suicidal ideation or completed suicide, underscoring the criticality of exploring risk factors within this domain (Khaleghpour et al., 2023). Despite its contradictory nature to the inherent drive for self-preservation, self-harm behavior is underpinned by diverse motives, yet a comprehensive understanding of the underlying processes fueling its inception, perpetuation, and recurrence remains elusive.

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This particular form of behavior is carried out consciously and devoid of any suicidal intent, aiming to cause harm to bodily tissues through various methods such as cutting, burning, hitting, scratching, biting, grabbing, injuring, or hindering the healing process of wounds on the body. It is widely recognized that self-injurious behaviors often co-occur with suicidal tendencies and have the potential to serve as precursors to suicide over an extended period of time.

One of the cognitive patterns that has garnered significant attention from researchers in recent years for its role in perpetuating self-harm is rumination. Rumination is characterized by persistent and repetitive thoughts centered around a specific theme that intrude upon consciousness involuntarily, diverting attention away from the individual's tasks and objectives (Jacobson & Truax, 1992). Distinguishing rumination from other cognitive processes and outcomes such as negative automatic thoughts, self-focused attention, self-awareness, and worry is crucial, as it is a defining feature of various disorders including anxiety disorders (Brozovich et al., 2015).

According to psychologist Martin et al. (2003), individuals who engage in rumination often experience heightened levels of stress and busyness in their lives, potentially leading to cognitive impairments. Moreover, there is a belief that women tend to ruminate more frequently than men due to inherent differences in emotional states (Soleimani et al., 2015). Research by Mee et al. (2022) has identified rumination as a risk factor in self-injury, while Nicolai et al. (2016) have underscored the significance of rumination in adolescent self-harm. These studies collectively highlight the pivotal role of rumination in the context of self-injurious behaviors.

Cognitive-behavioral therapy stands as a psychotherapeutic approach that aims to address dysfunctional emotions, maladaptive behaviors, processes, and cognitive patterns through a systematic, explicit, and goal-oriented framework. This therapeutic modality encompasses elements of behavioral therapy, cognitive therapy, and an integrative approach drawing from foundational principles and empirical research in both behavioral and cognitive domains (Ghielen

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et al., 2019). Among the effective cognitive strategies utilized within this framework is cognitive restructuring, premised on the notion that an individual's emotional and behavioral responses are not solely a product of external events but are heavily influenced by the interpretation of those events. By emphasizing the impact of cognitive processes on emotion and behavior, cognitive restructuring elucidates how individuals may experience anxiety and distress when their core values are perceived to be under threat, leading to a biased and distorted interpretation of events (Wine, 1980).

The cognitive restructuring approach aims to identify and examine irrational expectations, as well as beliefs that contribute to the development of emotional and communication disorders. Subsequently, these detrimental beliefs and expectations are scrutinized empirically or realistically) Clark, 2013(. In a study conducted by Dawkins et al. (2019), titled "Cognitive Emotional Regulation and its Relationship with Self-Injury," it was discovered that the application of cognitive restructuring, a cognitive-behavioral technique, yielded positive outcomes in reducing self-injury incidents. Another research on the impact of cognitive re-evaluation on self-injury revealed that cognitive restructuring strategies effectively mitigated self-injurious behaviors among adolescents (Slee et al., 2007).

The significance of addressing this research stems from the observation that the existing studies on self-injury in Iran are limited, particularly in terms of exploring the efficacy of cognitive restructuring on rumination in teenage girls. This prompts the question of whether the training and implementation of cognitive reconstruction for rumination in adolescents with self-injury is indeed efficacious. Specifically, the inquiry revolves around the potential of cognitive restructuring training to diminish instances of self-injurious behaviors. The pursuit of answers to these inquiries has motivated researchers to delve into the training methodologies of cognitive reconstruction techniques for the purpose of reducing self-injurious behaviors.

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Material and Methods

This investigation represents a quasi-experimental design featuring pre-test and post-test assessments, encompassing a control group. The study focused on all female students exhibiting self-harm tendencies in Baharestan city during the academic year 2023. Participants had a background of self-harm and had sought help from counseling centers. A total of 36 individuals were purposefully and clinically assigned to either the experimental or control group. Upon the completion of the written bereavement task, participants were requested to respond to rumination questionnaire (Nolen-Hoeksema & Morrow, 1993) and Inventory of Statements About Self-Injury (Klonsky et al., 2015). Subsequently, the experimental group underwent 8 sessions lasting 90 minutes each, where they received cognitive restructuring collectively, whereas the control group did not undergo any form of intervention. Following the intervention sessions, both groups completed the aforementioned questionnaires once more.

Rumination questionnaire: This scale that developed by Nolen-Hoeksema and Morrow (1993) comprises 22 items assessing an individual's responses to depressed mood, specifically rumination responses. Subscales include self-centered rumination, symptom-centered rumination, and antecedent/consequence-oriented rumination, rated on a four-point Likert scale. The overall rumination response score is derived from the sum of the subscale scores. The reliability of the scale was assessed using Cronbach's alpha coefficient. For depressed patients, the coefficients for the total score and subscales ranged from 0.85 to 0.91, while for the general population and students, they varied between 0.85 to 0.92, indicating good internal consistency. Content validity was confirmed through expert judgment and Kendall's agreement coefficients, yielding values of 0.74 to 0.88 (Besharat & Mehr, 2009).

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The implementation process involves conducting cognitive restructuring therapy sessions as outlined in the manual by Ryan McMullin (2002), translated by Firouzbakht (2019). These sessions will be held twice a week, spanning 8 sessions of 90 minutes each. Previous studies by Mahshid Sasanpour (2014) on marital satisfaction and Hossein Salimi (2015) on students' mental health have successfully applied this therapy protocol.

Table 1. Cognitive restructuring therapy sessions

Session	Content
1	Establishing communication, the method: explaining the objectives of the meetings, explaining the rules for attending the meetings, pretest performing
2	Illogical thoughts and inconsistent knowledge, method: illogical thoughts, explanation of cognitive errors, explanation of goals and realistic expectations, mutual expectations and attention to positive features.
3	He paid close attention to all the things that are going on in the person, that is, everything that the people of the sample group thought, felt, did, remembered or with their sense organs. receives and considers all these as behavioral data so that the consultant and the people of the sample group can put the experimental events into practical terms and propose principles to change them.
4	Explanation of illogical beliefs, techniques of questioning illogical beliefs, technique of challenging thoughts, examining the problems of dogmatic thinking.
5	Communication styles, its feedback, method: knowing the different types of communication styles, the difference between aggressiveness and self-expression (aggressive, aggressive and conscientious styles) and self-awareness
6	The concept of a perfect human being, method: recognition of unsatisfied emotional needs and the release of blocked emotions
7	Cognitive tracking, method: tracking cognitive distortions, testing cognitive distortions
8	Teaching problem solving, answering questions and doing post-examination.

Results

The statistical analysis of the mean and standard deviation pertaining to the pre-test and post-test scores of rumination within both the experimental and control groups is illustrated in Table 2. Examination of the control group reveals a minimal variance in the mean scores between the pre-test and post-test phases; conversely, the experimental group displays a notable decline in the post-test scores compared to the pre-test scores.

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Table 2. Statistical description of pre-test-post-test of rumination by group

Group	Variable	Pretest		Posttest	
		Mean	SD	Mean	SD
Control	Self-centered rumination	19.87	4.033	19.33	3.266
	Symptom-oriented rumination	18.03	2.532	18.70	2.846
	Antecedent/consequence oriented rumination	13.47	5.115	13.03	5.273
	Total rumination score	51.37	4.700	51.07	6.513
Experimental	Self-centered rumination	20.20	3.570	17.27	3.283
	Symptom-oriented rumination	18.30	3.150	15.23	3.494
	Antecedent/consequence oriented rumination	13.87	4.545	10.83	3.098
	Total rumination score	52.37	5.808	43.33	5.341

In order to investigate the effectiveness of cognitive restructuring on rumination in girls suffering from self-injury, multivariate covariance analysis was used. The Shapiro-Wilk test was used to check the normality of the distribution of scores, which confirmed the assumption of normality of the distribution of scores due to the non-significance of the obtained values. The results of the homogeneity test of the regression slope of the pre-test and post-test scores in the experimental and control groups showed that the regression slope was the same in both groups (P<0.05, F_6.42=2.018). The results of Levene's test to check the homogeneity of the variance of the dependent variables in the groups showed that the variance of the component of self-centered rumination (p<0.05, F-1.28=1.89), cue-centered rumination (p<0.05, 2.621= F_1.28) and antecedent/consequence oriented rumination (p<0.05, F_1.28=0.698) are equal in the groups. The results of the M-box test to check the equality of the covariance matrix of the dependent variables between the experimental and control groups also showed that the covariance matrix of the dependent variables is equal in the two groups (p<0.05, F=0.693, Box M=4.713).

The results of Bartlett's chi-square test to check the sphericity or significance of the relationship between the variables showed that the relationship between these components is significant ($p < 0.01$, df = 5, $x^2 = 20.431$). After examining the assumptions of multivariate covariance analysis,

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the test results showed that there is a significant difference between rumination of two groups (p<0.01, F_3.23=12.856, Wilks Lambda=0.374). In order to determine the distinct rumination components between the experimental and control groups, the outcomes of univariate covariance analysis are presented in Table 3.

Table 3. The results of univariate covariance analysis of the difference between the experimental and control groups in rumination components

Variable	Source	SS	DF	MS	F	P	Effect size
Self-centered rumination	Between group	39.626	1	39.626	14.338	0.001	0.364
	Error	69.095	25	2.764			
Symptom-oriented rumination	Between group	104.472	1	104.472	16.316	0.001	0.395
	Error	160.078	25	6.403			
Antecedent/consequence oriented rumination	Between group	42.702	1	42.702	10.679	0.003	0.299
	Error	99.971	25	3.999			

According to Table 3, the F statistic for the self-centered rumination component (P < 0.01, F_1.25 = 14.338), symptom-oriented rumination (P < 0.01, F_1.25 = 16.316) and antecedent/consequence rumination axis (P>0.01, F_1.25=10.679) is significant. The results suggest a notable distinction in the rumination levels between the control and experimental cohorts. Based on these results, it can be inferred that cognitive restructuring has proven effective in decreasing rumination among adolescent females engaging in self-harm behavior. Furthermore, the statistical analysis presented in Table 2 demonstrates that group allocation accounts for 36.4% of variations in self-focused rumination, 39.5% of variations in symptom-focused rumination, and 29.9% of variations in antecedent/consequence-focused rumination.

Discussion

The outcomes derived from the statistical examination, arising from the impact of cognitive restructuring intervention on the rumination tendencies of female students grappling with self-injury, suggest that cognitive restructuring has effectively mitigated the rumination tendencies among adolescent girls with self-injury. This finding aligns with the studies conducted by Yu et al. (2023), In et al. (2021) and Ghielen et al. (2019). One of the potential rationales behind the

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substantial efficacy of cognitive restructuring pertains to the cultivation of diverse competencies, encompassing the discernment of maladaptive thoughts, distorted convictions, cognitive fallacies, exposure, and intellectual challenges facilitated through group sessions, thereby assisting in alleviating the perseveration of ruminative thoughts.

In elucidating this phenomenon, it can be posited that an individual's psychological well-being hinges on their capacity to accurately process information. In instances where an individual exhibits deficiencies in information processing capabilities, they are susceptible to cognitive fallacies, leading to distress and psychological maladies. For instance, individuals ensnared by negative ideations may perceive themselves as entrapped in insurmountable predicaments, fostering a belief in the intractability of their issues. The provision of cognitive restructuring training to such individuals serves to unveil cognitive distortions fueling rumination and negative affect, prompting individuals to recognize their illogical ruminations and misconstrued interpretations of events, and redirect their cognitive endeavors. Evidently discernible from the findings of this study, cognitive restructuring training has effectively rectified individuals' cognitive frameworks, exposing and rectifying erroneous thought patterns at their cognitive bedrock.

Limitations of the Research: Due to the restricted access to both male and female students, the study was exclusively conducted on one gender, warranting future investigations to encompass the male student populace as well. It is recommended that in addition to this bilateral approach, alternative therapeutic modalities aimed at regulating the emotional states of adolescents contending with self-harming behaviors should be explored.

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Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by the ethics committee of the Islamic Azad University. The patients/participants provided their written informed consent to participate in this study.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection, and analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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