



Research paper: The Effectiveness of a School-based Self-injury Prevention Program on Reducing Interpersonal Cognitive Distortion and Fear of Negative Evaluation in Adolescent Girls



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ABSTRACT

Background: Non-Suicidal Self-Injury (NSSI) is a prevalent, harmful, and transdiagnostic behavior that can comprehensively be assessed in daily life studies.

Objectives: This study aimed to determine the effectiveness of the student self-injury prevention program in mitigating the Interpersonal Cognitive Distortion (ICD) and the fear of Negative Evaluation (FNE).

Materials & Methods: This research is a quasi-experimental study with a pre-test-post-test design, a one-month follow-up, and a control group. The statistical population consisted of all female adolescents studying at the middle schools of Rasht City, Iran, in the 2019–2020 academic years. They must have experienced self-injury at least once. The purposive non-random sampling technique was employed to select 34 self-injuring adolescents, who were then randomly assigned to case and control groups. The interpersonal cognitive distortion scale and the brief fear of negative evaluation scale were adopted to collect data. The case group received 16 sessions of self-injury prevention training for students (twice a week), whereas the control group had no training programs. Analysis of variance and multivariate analysis of variance were then used for data analysis in SPSS v. 25.

Results: The results demonstrated the significant effectiveness of the training program in mitigating the ICD (interpersonal rejection: $P < 0.01$; $F = 21.780$, unrealistic relationship expectations: $P < 0.01$; $F = 51.096$, interpersonal misperception: $P < 0.01$; $F = 20.557$), reducing negative meta-emotion, and increasing positive meta-emotion ($P < 0.05$; $F = 43.591$).

Conclusion: The student self-injury prevention program effectively reduced the ICD and FNE of female adolescents. Additionally, these two variables have high levels in adolescents struggling with self-injury.

Keywords: Self-injurious behavior, Cognition disorders, Negative thinking, Adolescent

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Highlights

- Self-injury prevention training effectively mitigates interpersonal cognitive distortion and the fear of negative evaluation among students.
- Training female adolescents in problem-solving and improving their communication skills can be an effective intervention program for preventing self-injury at schools.

Introduction

In most studies, Non-Suicidal Self-Injury (NSSI) is defined as the deliberate self-inflicted destruction of the body without suicidal intent and for purposes not socially sanctioned [1].

NSSI is of particular interest to counselors in schools, as NSSI has emerged as a significant issue in school settings [2, 3]. With prevalence rates highest in adolescence and NSSI onset peaking during school-age years, counselors in schools are at a unique vantage point for identifying and managing youth struggling with self-injury [3]. Indeed, in a recent study, nearly 70% of school counselors reported having encountered at least one student who has engaged in NSSI [4]. However, despite increasing clinical awareness and close contact with youth who injure themselves, school counselors indicate a problematic lack of training regarding NSSI and consistently report feeling “in the dark” and ill-equipped to work effectively with students who commit self-injury [4].

To identify the risk and protective factors in students' self-injury, the researchers used the Delphi method and collected information from experts in this field, including psychologists and school counselors. In the results obtained by experts, two classes of risk factors affecting students' self-injury were reported: Interpersonal Cognitive Distortion (ICD) and Fear of Negative Evaluation (FNE) [5].

Cognitive distortions and negative cognition contribute to adolescent suicide ideation [6]. Several researchers aimed to study the inter-related mechanisms between cognitive distortion, self-injury, and suicidal ideation [6-9]. If these distortions occur repeatedly, they may end in psychological disorders and abnormal behavior [10]. Cognitive distortions are among the causes of different disorders, such as depression [11, 12] and anxiety [13] in adolescents. These disorders are highly prevalent among people who have experienced self-injury [6, 14-16].

FNE is the key factor in negative thoughts. It can lead to cognitive distortions and is involved in a person's attempt to interact with others, intensifying the loneliness experience [17-20]. Attachment to family, friends, or peers is among the most basic psychological needs of humans. If left unsatisfied, this need can drive adolescents to high-risk behaviors, such as the use of drugs, self-injury behaviors, and suicidal thoughts [21-23].

According to a few studies on self-injury in Iranian schools, this behavior is highly prevalent among students, particularly females. Other studies conducted in Iran have focused more on identifying causes of self-injury [24] or clinical populations, especially regarding Borderline Personality Disorder (BPD) [25, 26]. There have been no studies on self-injury prevention methods at schools and their effectiveness in reducing the related risk factors. Hence, this study analyzes the effectiveness of a multifaceted psychological program for self-injury prevention in mitigating ICD and FNE and addresses two research questions: 1) Is the proposed self-injury prevention training program effective in reducing the ICD of female students? 2) Is the proposed self-injury prevention training program effective in reducing the FNE of female students?

Martiales and Methods

Statistical population, inclusion and exclusion criteria

This research is an applied quasi-experimental study with a pre-test-post-test design, a one-month follow-up, and a control group. The statistical population consisted of all female adolescents studying at the junior high schools of Rasht City (Guilan Province, Iran) in the 2019-2020 academic year. The purposive sampling technique was employed to answer the research samples. Accordingly, at first, 8 middle schools were randomly selected, and then school counselors and officials were asked to introduce the students who experienced self-injury over the past year. The eligible students were identified through residual signs of self-injury on their bodies, self-report, and other reports of self-injury given to

school counselors, as well as a review of students' counseling files. Finally, 45 students were identified. Due to the nature of our quasi-experimental study, and considering the 10% dropout, 34 students were randomly chosen and assigned into intervention and control groups. The inclusion criterion was to commit self-injury at least once in the past year, based on the approval of the school counselors. The exclusion criterion was their absence from educational sessions for two sessions. Finally, one person from each group was excluded from the study, and the results of 32 subjects were analyzed.

After the parents of adolescents filled out the consent forms, the pre-test was conducted on both groups. The intervention group then received 16 90-min sessions of self-injury prevention training twice a week. The control group received no intervention. After the intervention, the post-test was conducted on both groups, and one month later, follow-up was taken from both groups with the same scales used in the pre-test and post-test.

Research Tools

Interpersonal Cognitive Distortion Scale

Designed by Hamamci and Öztürk (2004), the interpersonal cognitive distortion scale has 19 items with three subscales of interpersonal rejection, unrealistic relationship expectations, and interpersonal misperception. Scoring high on this 5-point scale (1=completely disagree, 2=disagree, 3=agree, 4=neither agree nor disagree, 5=quite agree) indicates that individuals have cognitive distortions toward close relationships [27]. The highest score is 95, and the lowest score is 19. The closer a person's score is to 95, the higher the cognitive distortion rate is. Hamamci and Öztürk reported reliability values by calculating internal consistency with the Cronbach α and test-retest after two weeks for the entire scale (0.67 and 0.74, respectively), interpersonal rejection (0.73 and 0.70, respectively), unrealistic relationship expectations (0.66 and 0.76, respectively), and interpersonal misperception (0.43 and 0.74, respectively).

There were significant correlations between the scale validity and the three scales of illogical beliefs (0.45), automatic thoughts (0.53), and tendency toward interpersonal conflicts (0.53) [27]. Esmacelpour, Bakhshipour, and Mohammad Zadegan [28] analyzed this scale among Iranian students and revealed that unrealistic relationship expectations, interpersonal rejection, and interpersonal misperception explained 49% of the variance. The highest and lower factor loads were obtained from the first and third factors, respectively. Also, Cron-

bach's alpha coefficient for the whole scale was 0.85 and the correlation between subscales was between 0.71 and 0.81, which were desirable in terms of reliability and validity, respectively [28].

Brief Version of Fear of Negative Evaluation Scale

The brief version of the fear of negative evaluation scale (Leary, 1983) contains 12 items measuring the experienced anxiety or negative evaluation. Eight items of this scale measure the presence of fear and anxiety of negative evaluation on the part of other people, whereas the other four measure the absence of fear and anxiety of negative evaluation. The scale items are scored on a 5-point rating scale (1="not at all characteristic of me" to 5="extremely characteristic of me"), with higher scores representing a greater FNE. Scores between 12 and 24, 24 and 36, and a score above 36 indicates low fear of negative evaluation, moderate fear of negative evaluation, and high fear of negative evaluation, respectively. Every item is answered on a 5-point scale (1 for never true to 5 for always true). Leary analyzed the psychometric characteristics of this scale in an educated population and reported the correlation coefficient of its long-form (0.96) and its retest reliability (0.75) after two weeks [29].

In the study conducted by Geravand et al. in its Persian version, the estimated Cronbach α values of the total score and the subscales of positively and negatively scored items are 0.80, 0.82, and 0.81, respectively [30]; the 2-week retest coefficients of the total score and subscales were reported between 0.77 and 0.79. The scales were performed in the first and last training course sessions and one month later (follow-up) for both groups.

Developing the student self-injury prevention training program

In this section, the research literature was reviewed. Also, we used the Ketone research questionnaire (roles of risk factors and protective factors in decreasing and increasing self-injury) [31], along with the qualitative Delphi technique to collect data regarding the risk factors and protective factors involved in adolescents' self-injury behavior. Finally, we sought the help of experts and school consultants who had close relationships with adolescents [5]. In this study, the training program included group sessions and workshops, in which the participants were involved in training and learning processes during every session (Table 1).

Table 1. General instructions for the self-injury prevention training program

Sessions	Domains	Descriptions
1		The thinking-feeling-behavior cycle and its formation, as well as defective cycles and their removal method, were explained and practiced in the session. Homework for the next week was provided to recognize this defective cycle in real life, making attempts to modify it.
2	Cognitive reconstruction	The assignment was provided to identify beliefs and influence behavior and feeling until the next meeting.
3		Harmful thoughts were identified and replaced with more helpful ideas, and their effects on the members' feelings and behavior were reviewed. The "stop thinking" technique was taught to prevent harmful thoughts.
4	Training life skills	The conflict resolution method was explained in conflict situations and practiced in the session.
5		Anger control techniques and effective evacuation methods were trained.
6	Conflict mitigation	Members were taught the skills of getting help from friends, family, and school officers in unpleasant and critical situations.
7	Self-encouragement	Members talked about each other's strengths. The individuals explained the impact of their strengths in their daily relationships and tried to bridge the gap between the talents and the constraints they imposed on themselves.
8		Appropriate targeting was taught using Adler's approach.
9	Induction of positive mood	Relaxation was fully trained and practiced in the session.
10		Positive mental imagery technique was taught. Its effect on relaxation and how to use it in stressful situations were explained.
11	Problem-solving skill	Problem definition, problem-solving steps, and adopting a problem-solving approach were taught in practice.
12		Following the previous session, a list of different solutions was prepared; the best solution was selected, and the implementation of the selected solution was trained and practiced.
13	Emotion regulation	In this session, members were introduced to the role of emotion and feeling in life. Types of emotion (fear, sadness, joy, etc.) were introduced, and how emotion becomes a disease was explained.
14		Members became acquainted with different types of personality. The role of genetics in emotion, environmental factors affecting emotion, and barriers to emotion expression were explained.
15		Emotional avoidance and its consequences on behavior and feelings were explained. The correct ways of expressing emotion and the need for emotional awareness were explained.
16		In this session, a general review of training sessions and answering members' questions was conducted, and a pre-test was performed.



Data analyses were done by univariate analysis of variance (ANCOVA) and multivariate analysis of variance (MANCOVA) in SPSS v. 25.

Results

Table 2 presents the demographic characteristics of the experimental and control groups. There is no significant age difference between the two groups. In the case of paternal education, most fathers have undergraduate and postgraduate education, and there is no difference

between the two groups in this regard. In addition, the results of the Chi-square test show that the two groups are homogeneous in terms of demographic characteristics (age: $\chi^2=0.222$, $P=0.895$; father's education: $\chi^2=0.158$, $P=0.924$; mother's education: $\chi^2=0.535$, $P=0.765$).

MANCOVA was employed to analyze the effectiveness of interventions based on the self-injury prevention program in ICD components of female adolescents by considering pre-training differences and observing parametric statistics. In contrast, the ANCOVA was utilized

Table 2. Demographic characteristics of the subjects

Variables	No. (%)		Statistics	P	
	Experiment	Control			
Age (y)	12	4(31.25)	5(31.25)	0.222	0.895
	13	5(43.75)	4(25)		
	14	7(43.75)	7(43.75)		
Father's education	Diploma and under diploma	7(43.75)	8(50)	0.158	0.924
	Associate Degree	3(18.75)	3(18.75)		
	Bachelor and higher	6(37.50)	5(31.25)		
Mother's education	Diploma and under diploma	6(37.50)	5(31.25)	0.535	0.765
	Associate Degree	5(31.25)	4(25)		
	Bachelor and higher	5(31.25)	7(43.75)		



to analyze FNE. Afterward, the indices were first described. The hypotheses and then findings were reported. Finally, the durability of intervention effectiveness (based on the self-injury prevention training program) was analyzed in female adolescents' ICD and FNE. [Table 3](#) and [Figure 1](#) present the descriptive findings of ICD and its subcomponents and those of FNE in the intervention and control groups.

The skewness and kurtosis indices and the Shapiro-Wilk test were employed to analyze the normal distribution of ICD components and FNE. The indices and findings indicate the normal distribution of these components in the pre-test, post-test, and follow-up. In other words, the insignificance values of the Shapiro-Wilk test indicate the normal distribution of ICD and FNE components. Furthermore, the skewness and kurtosis of significance should range between -3 and +3. The resultant indices showed the normality of distribution. Hence, the hypothesis of the normal distribution of variables is confirmed [32]. Accordingly, the use of parametric analysis is allowed.

The F-test was conducted to analyze the regression slope homogeneity hypothesis in the pre-test and post-test of ICD components and FNE in the research groups. The F-test results showed the insignificance of the F statistics (ICD: $P > 0.05$, $F = 0.297$; FNE: $P > 0.05$, $F = 0.070$). Therefore, the research groups had an equal regression slope in the pre-test and post-test for both variables. Accordingly, the regression slope homogeneity hypothesis is held, and the rest of the analysis is allowed.

Levene's test was conducted to analyze the homogeneity of variances in the research groups for the post-test of ICD components and the FNE variable. The results demonstrated that the variances of the dependent variable were equal in the research groups for ICD components and the FNE variable. Thus, the homogeneity hypothesis of the research groups was confirmed, and the analysis was allowed to continue.

The Box's M test was employed to analyze the homogeneity hypothesis of variance-covariance matrices. The results showed that for ICD components (Box's $M = 6.977$, $F = 1.036$, $P = 0.4$), the Box's M statistic was significant in the analysis, and therefore, the presumption of variance indifference was confirmed. As a result, the analysis was allowed to continue. The results of MANCOVA indices, including Pillai's trace, Wilks' lambda, Hotelling's effect, and largest root tests, were significant for ICD components ($P < 0.001$; $F = 32.192$; Wilks' lambda = 0.206).

[Table 4](#) presents the results of MANCOVA to compare the differences of research groups in terms of each ICD component. Accordingly, the two research groups were significantly different in terms of all three ICD components. In other words, the self-injury prevention training program effectively improved these components. Given the Eta squared, the "unrealistic relationship expectations" had the largest difference. In other words, 65% of the variance pertaining to the difference between the two research groups was due to the interventional conditions in the post-test with the statistical control of pre-

Table 3. Mean±SD of pre-test, post-test and follow-up interpersonal cognitive distortion and fear of negative evaluation in the intervention and control groups

Groups	Condition	Mean±SD		
		Pre-test	Post-test	Follow-up
Intervention	Interpersonal rejection	26.37±1.746	21.75±4.732	22.94±2.407
	Unrealistic relationship expectations	27.56±1.504	22.19±1.759	22.88±2.604
	Interpersonal misperception	7.56±1.365	5.38±1.088	5.38±2.473
	Interpersonal cognitive distortion	61.50±3.055	49.31±2.651	48.56±3.119
	Fear of Negative Evaluation	41.69±3.945	32.56±3.162	32.44±3.577
Control	Interpersonal rejection	25.62±1.544	25.56±1.788	24.87±3.519
	Unrealistic relationship expectations	26.81±1.328	26.69±1.302	27.75±2.933
	Interpersonal misperception	8.56±1.365	7.88±1.628	7.44±2.476
	Interpersonal cognitive distortion	61±2.608	60.13±2.500	60.19±2.257
	Fear of negative evaluation	39.94±3.336	40.06±3.473	22.94±2.407



test scores. The values of the power indicated that differences could be found between the two means in the population with a probability of 99% to 100%.

Table 5 reports the results of ANCOVA to determine the difference between intervention and control groups in the FNE post-test with the statistical pre-test control of this variable. Accordingly, the results indicate that the two groups were significantly different in terms of FNE

($P < 0.05$; $F = 43.591$). As the Eta squared shows, the difference between the two groups in the post-test is significant regarding the statistical pre-test control. The difference was reported at 0.601, which means that 60% of the variance for the difference between the two groups in the FNE post-test was owing to the experimental conditions with the statistical pre-test control. The power of the test shows that these two means might be found different in the population with a probability of 100%.

Table 4. MANCOVA results of interpersonal cognitive distortion component

Sources	Component	Sum of Squares	df	Mean	F	P	Partial Eta	Observed
Interpersonal rejection	Group	64.339	1	64.339	21.780	0.001	0.446	0.994
	Error	79.759	27	2.954	-	-	-	-
	Total	18117.000	32					
Unrealistic relationship expectations	Group	117.883	1	117.883	51.096	0.001	0.654	1
	Error	62.292	27	2.207	-	-	-	-
	Total	19344.000	32					
Relationship misperception	Group	42.358	1	42.358	20.557	0.001	0.432	0.992
	Error	55.635	27	2.061	-	-	-	-
	Total	1512.000000	32					



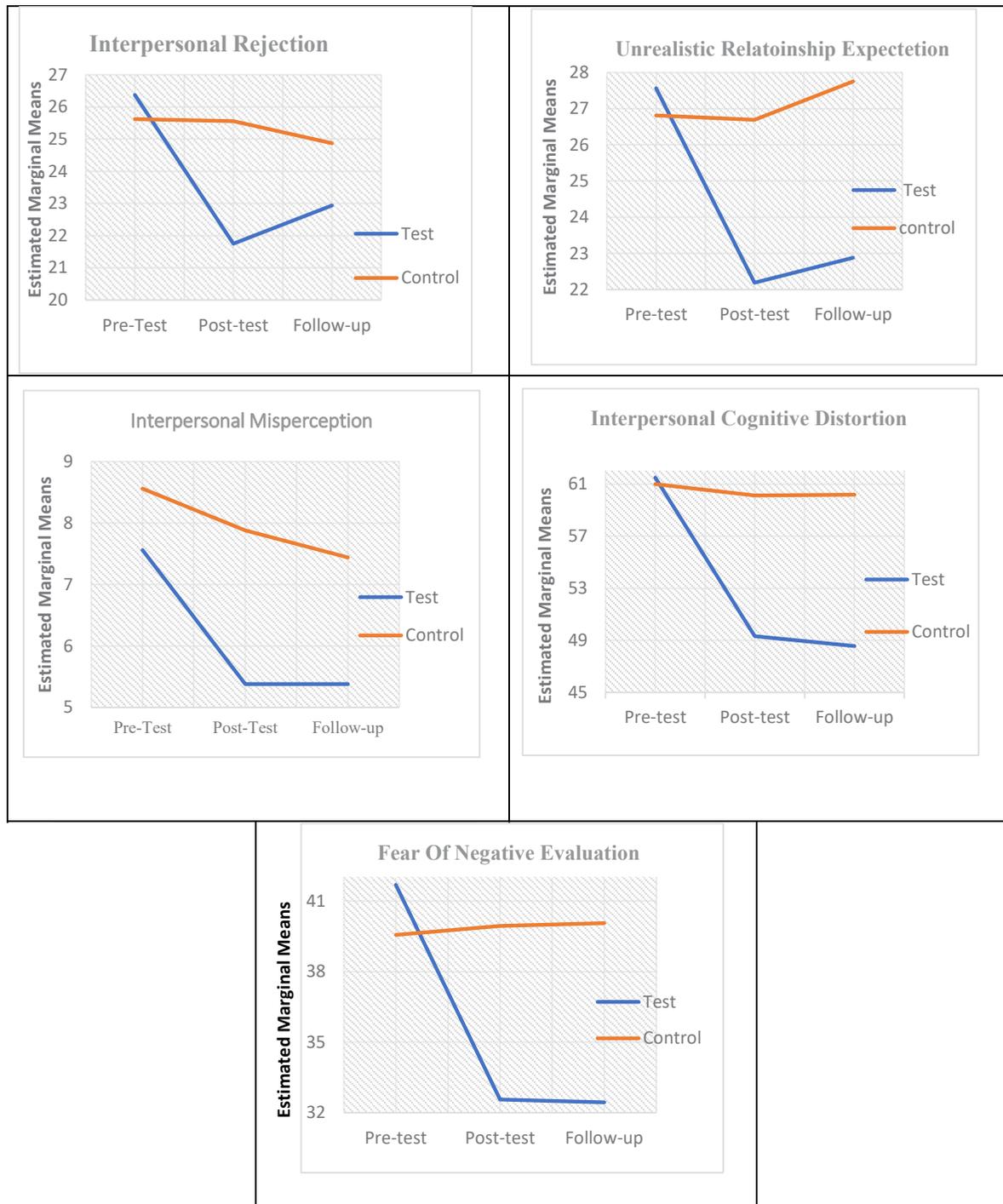


Figure 1. The means of the intervention and control groups for ICD and FNE in pre-test, post-test, and follow-up phases (taken from Table 3)

Analyzing the durability of effectiveness of self-injury prevention training program on ICD and FNE

The differential post-test and follow-up scores were calculated to analyze the durability of the effectiveness

of the self-injury prevention program. These differential scores were then compared between the two groups. According to the findings of MANOVA, the multivariate F was statistically significant (at $P < 0.0001$) in all tests for ICD and FNE components. Hence, there was a significant difference between the two groups, at least in one

Table 5. ANCOVA results of fear of negative evaluation

Sources	Sum of Squares	df	Mean of Squares	F	P	Eta	Power
Group	450.24	1	450.24	43.591	0.001	0.601	1
Error	299.53	29	10.33				-

 CJNS

of the components. The ANCOVA was employed to determine this difference. According to [Table 6](#), the significance level is below $P < 0.01$ for interpersonal rejection, unrealistic relationship expectations, and FNE. Therefore, the intervention durability was confirmed for both components. Regarding the interpersonal misperception, the durability of the proposed intervention program was not confirmed.

Discussion

This study aimed to analyze the effectiveness of the self-injury prevention training program in mitigating ICD and FNE among female adolescents who had experienced self-injury. According to the results, the participant's scores in the case group reduced significantly as opposed to those of the control participants in the post-test for all three ICD components (interpersonal rejection, unrealistic relationship expectations, and interpersonal misperception). In other words, the self-injury prevention intervention effectively reduced the ICD of the adolescents. The follow-up results of the proposed training program demonstrated the durability of its effects on interpersonal rejection and unrealistic relationship expectations. However, it had no durable impact on interpersonal misperception. Owing to the critical effects of interpersonal relationships on self-injury among adolescents, it is recommended that future studies pay more attention to the development of training programs in this regard.

Many studies analyzed the cognitive distortion mechanisms and suicidal ideas. For instance, Wen et al. (2021) investigated cognitive impairment among depressed

self-injuring adolescents. For this purpose, they draw a comparison among a group of depressed adolescents with a history of self-injury (18 individuals), a group of depressed adolescents with no history of self-injury (21 individuals), and 24 healthy adolescents. According to their results, the depressed adolescents with a history of self-injury had significant cognitive impairment as opposed to the other two groups. The self-injuring adolescents also had significant differences from the other two groups regarding the childhood abuse questionnaire. In terms of the "shame scale," the depressed adolescents (with or without a history of self-injury) obtained significantly higher scores than the healthy adolescents. Wen et al. (2021) also indicated that the cognitive functions of depressed adolescents with a history of self-injury were disrupted dramatically in terms of memory loss, attention deficiency, and execution dysfunction [6].

Although Yung et al. (2021) showed that all types of cognitive distortions were significantly correlated with suicidal thoughts, the coefficients of the relationship were generally low (>0.04). Overgeneralization was the only cognitive distortion that was significantly predicted and explained suicidal thoughts. According to Gross (2014), overgeneralization is a cognitive error in which people draw a general conclusion with respect to a single experience. In this case, people can conclude that committing suicide is the only way of ending psychological pain based on their life experiences. Thus, reconstruction of these dysfunctional thinking patterns is the most important aspect in the intervention aiming at helping such individuals to think positively and constructively [7].

Table 6. Results of univariate analysis of variance interpersonal cognitive distortion and Fear of Negative Evaluation (FNE)

Sources	Dependent Variable	Sum of Squares	df	Mean of Squares	F	P
Interpersonal cognitive distortion	Interpersonal rejection	87.781	1	87.781	51.145	0.031
	Unrealistic relationship expectations	57.781	1	57.781	19.756	0.001
	Interpersonal misperception	253.125	1	253.125	1.177	0.287
Fear of negative evaluation	Total score of FNE	760.50	1	760.50	31.732	0.001

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Daneshvar, Shafiei, and Basharpour (2020) analyzed the effects of “self-compassion” on “self-injury” and cognitive distortion among women experiencing domestic violence. According to their research, therapies based on self-compassion could significantly modify cognitive distortions and prevent from experiencing self-injury [33].

According to the model proposed by Matthews (2013), several cognitive distortions; such as negative views of self, others, and future; dichotomous thinking; cognitive rigidity; attention bias; attention fixation; and overgeneralized memory are among the essential factors that can affect individuals’ problem-solving skills, cause to feel lonely, and finally result in self-injury or suicide [7].

Based on Piaget’s theory of cognitive development, a schema is distinctively specific to every individual since it is formed through the personal information and experiences gained in the universe [7]. These schemas are closely related to individuals’ feelings and behaviors. In this case, cognitive distortions result from the inefficient schemas caused by unfavorable life events (e. g., a traumatic experience, violence, bullying, and divorce of parents) that people have experienced since birth. Thus, these thinking patterns cause individuals to experience emotional and behavioral disorders in stressful and unpleasant situations. Eventually, they come up with suicidal thoughts and ideas because they cannot cope with psychological pains [7]. The results also indicated that the FNE scores of case participants reduced significantly in post-test and follow-up phases compared to those of the control participants.

Xavier et al. (2016) studied the role of specific internal traits characterized by shame, self-criticism, and fear of self-compassion on NSSI, through their effect on daily peer hassles and depression. Their results indicated that external shame, self-hatred, and fear of self-compassion indirectly predict NSSI through their impact on daily peer hassles and depression. The most pathological form of self-criticism (self-hatred) is closely associated with NSSI [23].

NFE is involved in individuals’ attempts at interacting with others; however, it may adversely affect the appropriate social interaction and intensify the loneliness experience [18-20]. Concentrated self-attention refers to shifting attention from extrinsic drivers to accurate self-evaluation in communication situations. These individuals show interpretive attention processing biases in response to the information they receive (e. g., an angry face or even a smile) in social communication situations. Therefore, they distort the received information and process them hostilely (e. g., a sign of humiliation or smirk).

When individuals are afraid of being evaluated negatively, they focus on intrinsically threatening drivers like anxiety reactions. In conflict with social functions, high anxiety levels can eliminate the chance of reevaluating the situation [21]. In other words, individuals avoid situations where social evaluation is possible; therefore, they gradually go into isolation. Social isolation and loneliness deprive adolescents of the need for attachment [18]. Attachment to the family, friends, or peers is among humans’ most basic psychological needs. If left unsatisfied, this need can drive adolescents to high-risk behaviors, such as the use of drugs, self-injury behaviors, and suicidal thoughts [22].

The proposed self-injury prevention intervention is a multifaceted program. In early sessions, this program includes cognitive reconstruction, modification of thought cycles (feeling–body–behavior), acquaintance with the A-B-C cognitive model, familiarity with cognitive distortions and methods of modifying those distortions. Some sessions included training the effective methods of resolving conflicts with others, positive visualization, and self-encouragement. Considering the recently proposed self-injury models emphasizing the roles of many extrinsic, intrinsic, and cognitive-emotional factors, the proposed training program was designed by considering risk factors and protective factors in self-injury to modify and reconstruct different dimensions affecting adolescents’ self-injury.

This study had some limitations. For example, the Delphi findings revealed that family and school were among the critical factors classified as risk factors and protective factors affecting the emergence of self-injury reported by experts. However, this study did not consider these factors. Hence, it is recommended that future studies design training programs for both students and the members of schools and families to acquire more durable and effective results. Besides, the follow-up phase was conducted one month after training due to lack of time. One month is a relatively short interval for analyzing the long-term effects of interventions.

Conclusion

The proposed self-injury prevention training program effectively mitigated the ICD and FNE among female adolescents struggling with self-injury. Cognitive distortions and FNE are among the factors affecting self-injury among adolescents. The modification and mitigation of these two factors can prevent self-injury among adolescents. According to the results, the proposed training program effectively reduced the ICD and FNE of female

adolescents' self-injury, both of which had high levels in adolescents struggling with self-injury.

Ethical Considerations

Compliance with ethical guidelines

All study procedures were conducted in compliance with the ethical guidelines of the 2013 Declaration of Helsinki.

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Authors contributions

Conceptualization and methodology: Fariborz Dortaj, Esmail Sadipour, and Kamran Sheivandi; Drafting the original paper: Neda Nezhadhamdy; Writing, reviewing, and editing: Neda Nezhadhamdy and Sajjad Rezaei; Collecting resources and data: Neda Nezhadhamdy; Supervising: Fariborz Dortaj; Statistical analyses: Esmail Sadipour and Kamran Sheivandi; Final approval of the study: All authors.

Conflict of interest

The authors declared no conflict of interest.

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