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Suicide Prevention in Adolescents: The Development and Evaluation of a Targeted Training Package

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ABSTRACT

Objective: This investigation was undertaken with the objective of formulating a training program aimed at the prevention of adolescent suicide and assessing its efficacy on suicidal ideation and impulsivity.

Methods: The research methodology employed was semi-experimental, incorporating both experimental and control groups. The targeted demographic for this study comprised adolescent female students in their second year of high school in Tehran during the year 2023. A total of 60 students were selected from the aforementioned cohort and subsequently allocated into two groups of 30 individuals each (experimental and control) utilizing a simple random sampling technique. The instruments utilized for data collection included Beck's scale for suicidal ideation and the Barratt Impulsiveness Scale. In this investigation, a suicide prevention training package was conceptualized and developed grounded in two theoretical frameworks: acceptance and commitment therapy (ACT) and an emotion-focused approach (EFT). The data were subjected to analysis through the statistical procedure of multivariate analysis of covariance.

Results: The findings indicated a statistically significant disparity in the levels of suicidal thoughts and impulsivity between the experimental and control groups in the post-intervention assessment. Accordingly, it can be inferred that the suicide prevention training package exerted a positive influence on the suicidal ideation and impulsivity among adolescents.

Conclusions: This training package may serve as a valuable resource for psychologists and counselors engaged in providing support services to adolescent populations.

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Introduction

Adolescence represents a critical phase in human development that transpires between childhood and adulthood, encompassing individuals aged 10 to 19 years. This developmental stage is pivotal for the establishment of a healthy lifestyle. Notwithstanding the significance of this period as a foundational element of well-being, the incidence of mortality, morbidity, and injuries among adolescents is alarmingly high. A considerable proportion of these adverse outcomes are preventable or amenable to treatment; during this developmental phase, adolescents establish behavioral patterns that can have long-lasting implications ([Organization, 2023](#)). Approximately 13% of children and adolescents globally experience mental health issues, and in 2021, 19% of adolescents across 21 countries reported experiencing low mood ([Hermann et al., 2022](#)). Numerous psychological disorders, including depression and anxiety, which exhibit a marked increase during adolescence, frequently persist into adulthood ([Aronson, 2022](#)). Recent empirical research has demonstrated that the prevalence of depression and anxiety among individuals aged 6 to 17 years in the United States escalated from 5.4% in 2003 to 8.4% in 2011 and 2012 ([Hossain et al., 2022](#)). As previously noted, the statistics pertaining to mortality, illness, and injury in adolescents are concerning, with one prominent risk factor being the propensity for suicide or suicide attempts. Suicidal ideation and self-harming behaviors, even in the absence of suicide attempts, are prevalent among adolescents and are intricately linked to subsequent suicide attempts ([Javdan et al., 2024](#)). Approximately one-third of adolescents who experience suicidal thoughts ultimately die by suicide. Theoretical frameworks addressing suicide provide a structured understanding of the continuum from suicidal ideation to the act of suicide itself ([Keefner & Stenvig, 2020](#)). In one investigation, it was revealed that outpatient hospital patients reported experiencing severe suicidal thoughts within the preceding month (Christens et al. 2021). In 1990, Beck articulated within the cognitive-behavioral model of suicide that impulsivity constitutes a voluntary characteristic that heightens susceptibility to suicide. Indeed, impulsivity is recognized as a significant contributor to mortality among adolescents; consequently, the identification of risk factors and the implementation of suicide prevention programs are crucial endeavors for professionals and clinicians. Impulsivity encompasses a spectrum of behaviors, including lack of inhibition, sensation-seeking, risk-taking, and urgency ([DeYoung & Rueter, 2010](#)). According to escape theory, the incidence of suicide is heightened by the recognition that

impulsivity is correlated with aggression, with each factor also being independently associated with suicidal behavior; the interrelationship among these variables is multifaceted ([Moore et al., 2023](#)). To date, research has predominantly concentrated on the phenomenon of suicide among adolescents.

Nevertheless, there exists a paucity of scholarly inquiry that has thoroughly explored this phenomenon through the examination and enhancement of pertinent variables such as suicidal ideation and impulsivity. Acceptance and Commitment Therapy (ACT) has been shown to be an effective intervention for reducing suicidal thoughts by helping individuals develop psychological flexibility and enhance their coping strategies ([Tighe et al., 2018](#)). ACT encourages individuals to accept their distressing thoughts and emotions rather than trying to avoid or suppress them, which can often exacerbate suicidal ideation. Through mindfulness techniques and value-based action, ACT helps individuals identify and commit to life goals that are meaningful to them, even in the presence of ongoing psychological pain ([Motamedi et al., 2019](#)). Research indicates that by fostering a greater sense of purpose and encouraging active engagement with life, ACT can significantly diminish the intensity and frequency of suicidal thoughts, offering a viable therapeutic option for those struggling with severe emotional distress. On the other hand, Emotion-Focused Therapy (EFT) has demonstrated effectiveness in reducing suicidal thoughts by helping individuals process and regulate intense emotions that often contribute to suicidal ideation. EFT emphasizes the importance of understanding and transforming maladaptive emotional patterns, which are frequently at the core of suicidal feelings ([Sadeghi et al., 2021](#)). By encouraging clients to explore and express their emotions in a safe therapeutic environment, EFT helps them develop healthier emotional responses and gain a deeper understanding of the underlying issues driving their distress. This emotional processing can lead to a reduction in feelings of hopelessness and despair, which are key factors in suicidal ideation. As individuals learn to manage their emotions more effectively, they often experience a decrease in the intensity and frequency of suicidal thoughts, making EFT a valuable approach in suicide prevention.

Given that adolescent suicide constitutes a critical concern within the realm of public health globally, and considering that suicide ranks as the fourth leading cause of mortality among youth ([Chen et al., 2020](#)), the principal inquiry guiding this research is whether the application of the training program formulated in accordance with Acceptance and Commitment Therapy (ACT) and

Emotion-Focused Therapy (EFT) interventions effectively address impulsive behavior. Alternatively, can the implementation of this educational intervention lead to a reduction in suicide attempts among adolescents?

Material and Methods

This research is semi-experimental research in which the effectiveness of the treatment approach was investigated by implementing an educational intervention. In this research, a pre-test-post-test design with a control group was used. The data collected was quantitative. In this study, this design consists of two groups of subjects, and both groups are measured twice. The first measurement was performed with a pre-test and the second measurement was performed with a post-test. In the following, the research plan is presented. The population studied in this research is teenage female students in the second year of high school in Tehran in the academic year 2023. 60 students who met the conditions to enter the research were selected from the mentioned society and placed in two groups of 30 people (experimental and control) by a simple random method. Considering that the researcher intended to apply independent variable in three levels and in the meantime to limit or eliminate the effects caused by the random variable of the pre-test, multivariate analysis of covariance statistical test was used in SPSS-22 software.

Instruments

In order to collect information, the questionnaires were used, which includes:

A) Beck Suicidal Thought Scale: The Beck Suicidal Thought Scale is a 19-question self-assessment tool. This questionnaire was prepared in order to reveal and measure the intensity of attitudes, behaviors and planning to commit suicide during the last week. The scale is based on 3 points from 0 to 2. Beck's suicidal ideation scale has reliability. Using the Cronbach's alpha method, the coefficient is 0.87 to 0.97, and using the test-retest method, the reliability of the test is 0.54. [Esfahani et al. \(2015\)](#) evaluated the reliability and validity of Beck's suicidal ideation scale in a study and showed that the Beck scale had a correlation of 0.76 with the depression scale of the Goldberg test, and the reliability of the scale was 0.95 using Cronbach's alpha method and 0.75 using the two-half method. Therefore, there is internal validity, test-retest validity and concurrent validity in this scale.

B) Barratt Impulsiveness Scale: Barrett Impulsiveness Scale included 30 items with a four-point Likert scale. Also, all items have a positive score ([Cosi et al., 2008](#)). After standardization in Iran: In the research of [Javid et al. \(2012\)](#), who have standardized this questionnaire, the number of items was reduced from 30 items to 25 items, and 5 items were removed from the questionnaire due to factor loading less than 0.30. In the research of [Javid et al. \(2012\)](#), the questionnaire has a good validity and the reliability of the questionnaire is as follows, Cronbach's alpha coefficient in attentional, motor, and non-planning impulsiveness is 0.70, 0.67, 0.80 respectively.

C) Suicide prevention training package

Table 1. Summary of suicide prevention training package sessions

Session	Title	Content
1	Introducing and establishing a good relationship between the group members, getting to know the members	Introducing the members through familiarization techniques (getting to know each other in the group within five minutes and then introducing them to the group), stating the rules of the group, expressing the expectations of the group members from the treatment and expressing their initial feelings to the group and to the here and now, teaching primary and secondary emotions. And explaining about being yourself and finding all emotions and expressiveness and considering them valid
2	Training awareness, recognition, acceptance, expression, tolerance and emotion regulation	Helping the person to access the unprocessed feelings and examining them in people with their own participation in order to identify and understand and discover their meanings in the context of their problem.
3	cognitive impairment; Examination of fusion and faulting	In this meeting, exercises were done to break it down using metaphors.
4	reaching acceptance (acceptance of issues)	In this meeting, the identification of individual values, definition of values, actions and obstacles were discussed.
5	Paying attention to your concept; Explain yourself as context	In this session, the concepts, role and context of self-observation as a platform were explained. People were asked about different perceptions of self and self-awareness.
6	Teaching interactive cycles and feedback loops to review communication issues and help the process of reflection on them	At this stage, the teaching of interactive cycles and their examination in people's problems, description, clarification and investigation of negative interactive cycles at the same time as they appear in meetings, reframing of the problem by paying attention to the negative cycle and infrastructure emotions were taught.
7	Increasing awareness about emotions and aspects of oneself that have not yet been owned by a person.	In this meeting, people's emotions towards themselves and the discovery of conflicts between personality poles within people and work on them through the technique of two chairs were discussed.
8	Bringing emotion closer to organismic experience and a call to action	Representing the remaining feelings and recalling them through experiential exercises and expressive arts techniques (using experiential verbal or visual exercises to represent and discover the hidden dimensions of your experience).
9	- Helping to create meaning and discover agency in new emotional experiences with an emphasis on the present	Training on the new way of dealing with one's emotions, evaluating the connection of new meanings with the creation of a new self.
10	Summary, overview of content and training	In this meeting, the experience of people participating in the group, the investigation of the incomplete feelings of the members about the end of the group, the setting of follow-up meetings if necessary or individual meetings for members who need individual counseling, and finally, the questions of the clients are answered.

Results

Multivariate Analysis of Covariance (MANCOVA) was used to investigate the effectiveness of the suicide prevention training package on reducing suicidal thoughts among adolescents. The results related to the implementation of this test and the examination of its assumptions are presented in table 2.

Table 2. The results of multivariate covariance analysis to compare suicidal thoughts in the experimental and control groups

Effect	Test	Value	F	DF1	DF2	P	Effect size
Group	Pillai's trace	0.598	26.241	3	53	0.001	0.598
	Wilks' lambda	0.402	26.241	3	53	0.001	0.598
	Hotelling's trace	1.485	26.241	3	53	0.001	0.598
	Roy's largest root	1.485	26.241	3	53	0.001	0.598

As can be seen, the significance level of all four relevant multivariate statistics, namely Pillai's trace, Wilks' Lambda, Hotelling's trace, and Roy's Largest Root is less than 0.01 ($p < 0.01$). In this way, the statistical null hypothesis is rejected and it is determined that there is a significant difference between the suicidal thoughts of the two experimental and control groups in the post-test. Based on this, it can be said that the suicide prevention training package has been effective on the suicidal thoughts of teenagers. In order to investigate the difference between the two experimental and control groups in each of the components of suicidal thoughts, the between-subjects effects test was used, the results of which are presented in table 3.

Table 3. The test of between-subject effects to compare the components of suicidal thoughts in the experimental and control groups in the post-test

Variable	Source	SS	DF	MS	F	P	Effect size
Willingness to die	Between group	60.121	1	60.121	16.899	0.001	0.235
	Error	195.673	55	3.558			
Preparation for suicide	Between group	60.201	1	60.201	12.824	0.001	0.189
	Error	258.193	55	4.694			
True suicidal tendencies	Between group	113.118	1	113.118	30.714	0.001	0.358
	Error	202.562	55	3.683			

Table 3 shows the results of the between-subjects test to compare the components of suicidal thoughts in the subjects of the experimental and control groups in the post-test phase. According to the results presented in Table 3, the F value obtained for all components is significant at the alpha level of 0.01 ($p < 0.01$). Therefore, the null hypothesis is rejected and the research hypothesis is confirmed. Considering the lower average scores of the experimental group in the post-test phase

compared to the control group, it is concluded that the suicide prevention training package was effective and reduced the suicidal thoughts of teenagers.

Correspondingly, multivariate Analysis of Covariance (MANCOVA) test was used to investigate the effectiveness of the suicide prevention training package on reducing the impulsivity of adolescents. The results related to the implementation of this test and the examination of its assumptions are presented in table 4.

Table 4. The results of multivariate covariance analysis to compare impulsivity in the experimental and control groups

Effect	Test	Value	F	DF1	DF2	P	Effect size
Group	Pillai's trace	0.554	21.953	3	53	0.001	0.554
	Wilks' lambda	0.446	21.953	3	53	0.001	0.554
	Hotelling's trace	1.243	21.953	3	53	0.001	0.554
	Roy's largest root	1.243	21.953	3	53	0.001	0.554

As can be seen, the significance level of all four relevant multivariate statistics, namely Pillai's trace, Wilks' Lambda, Hotelling's trace, and Roy's Largest Root, is less than 0.01 ($p < 0.01$). In this way, the statistical null hypothesis is rejected and it is determined that there is a significant difference between the impulsivity of the two experimental and control groups in the post-test. Based on this, it can be said that the suicide prevention training package has been effective on the impulsivity of teenagers. In order to investigate the difference between the two experimental and control groups in each of the impulsivity components, the between-subjects effects test was used, the results of which are presented in table 5.

Table 5. The test of between-subject effects to compare the impulsivity components of the experimental and control groups in the post-test

Variable	Source	SS	DF	MS	F	P	Effect size
Non-planning impulsiveness	Between group	122.132	1	122.132	21.030	0.001	0.277
	Error	319.412	55	5.807			
Motor impulsiveness	Between group	80.417	1	80.417	14.879	0.001	0.213
	Error	297.259	55	5.405			
Attentional, impulsiveness	Between group	145.201	1	145.201	22.780	0.001	0.293
	Error	350.568	55	6.374			

Table 5 shows the results of the between-subjects test to compare the impulsivity components in the subjects of the experimental and control groups in the post-test phase. According to the results presented in Table 5, the F value obtained for all components is significant at the alpha level of 0.01 ($p < 0.01$). Therefore, the null hypothesis is rejected and the research hypothesis is confirmed. Considering the lower average scores of the experimental group in the post-test phase compared

to the control group, it is concluded that the suicide prevention training package was effective and reduced the suicidal impulsivity of teenagers.

Discussion

Adolescent suicide represents one of the most lamentable occurrences within contemporary society. This phenomenon constitutes a critical public health challenge on a global scale. A fundamental approach to mitigating suicide rates involves the identification of individuals harboring suicidal ideations. The negative cognitions experienced by a teenager contemplating suicide are intrinsically linked to their interpretation of life events. Such individuals often perceive negative obstacles as insurmountable barriers, despite the existence of alternative, more constructive interpretations of their circumstances. They exhibit a proclivity toward the most pessimistic interpretations regarding their experiences. Ultimately, the negative outlook held by adolescents with suicidal ideation concerning their future embodies a sense of helplessness. When contemplating the future, these individuals are inclined to believe that the adverse circumstances currently confronting them will perpetuate due to perceived personal inadequacies, leading to a profound sense of despair ([Rahimi & Maredpour, 2021](#)). The suicide prevention package developed aims to articulate the factors that drive individuals to the brink of despair while underscoring preventive elements such as personal responsibility and autonomy, thereby aspiring to enhance overall health and diminish suicide rates. This initiative fosters hope and motivation, subsequently facilitating improved adaptation to prevailing conditions and, thereby, enhancing their mental well-being ([Walsh et al., 2023](#)). Consequently, it can be posited that the formulation of the suicide prevention package serves as a robust strategy for enhancing psychological frameworks, including the augmentation of life satisfaction, the attenuation of negative thoughts, the reduction of suicidal ideation, and the promotion of personal growth, excellence, and fulfillment. It assists in the quest for meaning and purpose, as well as personal development in life. Moreover, one of the significant challenges faced by adolescents pertains to the prevalence of suicidal thoughts, disruptions in adaptive or coping behaviors, and the manifestation of impulsive actions. These individuals encounter concrete and specific challenges and constraints in their coping behaviors. Adaptive behavior pertains to the efficacy with which individuals navigate the general expectations of life and their ability to fulfill the standards of personal autonomy that are

fitting for their respective age cohort, socio-cultural context, and particular social environment ([Malekshahi et al., 2020](#)). Adolescents experiencing suicidal thoughts frequently struggle to adapt to societal expectations and the quality of their daily functioning in response to environmental demands. The emphasis of suicide prevention training is centered around the acquisition, application, and generalization of specific adaptive skills imparted through this methodology, with the ultimate aim of assisting individuals in breaking free from and transcending this detrimental cycle, thereby reducing their levels of impulsivity.

One limitation of this study is the relatively small and homogenous sample size, consisting of only 60 female students from a single high school in Tehran. This restricts the generalizability of the findings to a broader adolescent population, particularly across different genders, cultural backgrounds, and educational settings. Additionally, the semi-experimental design, while useful in assessing the efficacy of the intervention, may not account for external variables that could influence the outcomes, such as the students' prior mental health history or concurrent psychological support outside the study. The reliance on self-reported measures for suicidal ideation and impulsivity may also introduce response biases, potentially affecting the accuracy of the data.

Future research should aim to address these limitations by expanding the sample size to include a more diverse group of adolescents, encompassing different genders, age groups, and cultural contexts, to enhance the external validity of the findings. Employing a longitudinal design could also provide insights into the long-term effectiveness of the suicide prevention training program, offering a better understanding of its sustained impact on suicidal ideation and impulsivity over time. Furthermore, incorporating additional data collection methods, such as interviews or behavioral assessments, could complement self-reported measures and provide a more comprehensive evaluation of the intervention's effectiveness. Finally, exploring the integration of other therapeutic approaches or tailoring the training program to specific subgroups within the adolescent population may help refine the intervention for broader applicability.

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 ethics committee of Islamic Azad University.

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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