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The Effectiveness of Self-Compassion Training on Emotion Regulation and Cognitive Flexibility in Adolescent Girls with Self-Harming Behavior

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A B S T R A C T

Objective: Adolescent girls with self-harming behavior experience difficulties in emotion regulation and cognitive flexibility. One of the approaches that can be effective in this regard is self-compassion training. Therefore, the present study aimed to determine the effectiveness of self-compassion training on emotion regulation and cognitive flexibility in adolescent girls with self-harming behavior.

Methods and Materials: The research method was quasi-experimental, using a pre-test, post-test, and one-month follow-up design. The statistical population consisted of adolescent girls with self-harming behavior who referred to counseling centers in District 16 of Tehran in 2022. Through purposive sampling, 30 eligible participants were selected and randomly assigned to experimental and control groups of 15 each. They completed the Garnefski and Kraaij (2016) Cognitive Emotion Regulation Questionnaire and the Dennis and Vander Wal (2010) Cognitive Flexibility Inventory at three stages. The Gilbert (2014) self-compassion training program was conducted in eight 60-minute individual sessions for the experimental group, and data were analyzed using repeated measures ANOVA.

Findings: The results indicated that self-compassion training significantly increased positive emotion regulation strategies and cognitive flexibility while reducing negative emotion regulation strategies in girls with self-harming behavior. This effect persisted at the follow-up stage ($P<0.001$).

Conclusion: It can be concluded that self-compassion training increases the likelihood of using positive emotion regulation strategies and cognitive flexibility in girls with self-harming behavior while reducing the likelihood of using negative emotion regulation strategies. Self-compassion training enhances individuals' mindfulness and prevents the process of over-identification. This profound experience leads individuals to cease self-judgment and self-criticism, experience self-acceptance, and gain greater awareness of their thoughts and emotions.

Keywords: *Self-compassion, Emotion, Flexibility, Self-harming.*

1. Introduction

High-risk behaviors include acts of violence and physical altercations with others, smoking, alcohol consumption, drug use, and high-risk sexual behaviors (Fuertes et al., 2017). High-risk behaviors are classified into three categories: situational, physical, and sexual. Situational high-risk behaviors are not inherently dangerous but can become hazardous in certain environmental contexts. For example, walking or hiking are not dangerous activities per se, but doing so at night in a neighborhood known for crime can be considered situational high-risk behavior (Walsh, 2012). According to Zadeh-Mohammadi et al. (2011), high-risk behaviors among Iranian adolescents include self-harm, dangerous driving, violence, alcohol use, sexual risk-taking, smoking, and drug use (Zadeh et al., 2011). Adolescents engaging in high-risk behaviors often exhibit emotional and cognitive dysfunctions (Khan et al., 2022). Self-harm, as a psychosocial issue, is one type of high-risk behavior that is particularly prevalent during adolescence (Blasczyk-Schiep et al., 2018). Self-harm is an inappropriate method of coping with emotional problems, stress, anger, and frustration. Although this behavior initially reduces tension and creates a sense of calm, it eventually leads to feelings of guilt, shame, and a resurgence of negative emotions. Self-harm behaviors are often impulsive and may stem from psychological issues such as depression, eating disorders, and borderline personality disorder (Blasczyk-Schiep et al., 2018).

Factors influencing self-harm include both external and internal factors. External factors encompass subcategories such as violence, major life changes, intoxication or numbness, interest in satanism, and conflicts with family members. Internal factors include conflict, loneliness, fear of violence, illness experiences, low self-esteem, negative emotions like anger and depression (Rissanen et al., 2008). Cognitive flexibility appears to play a role in the manifestation of dysfunctional behaviors (Dennis & Vander Wal, 2010). Cognitive flexibility is the ability to adapt successfully to stressful conditions, enabling individuals to confront negative and unpleasant experiences while maintaining psychological balance (González-Fernández et al., 2017). Cognitive flexibility refers to the extent of an individual's openness to internal and external experiences and involves the ability to stay present and distinguish oneself from thoughts and inner experiences (Eshagh Neymvari et al., 2024; Norouzi et al., 2023; Valizadeh et al., 2020). Those lacking cognitive flexibility tend to gravitate towards distressing thoughts and feelings during crises and high-pressure situations. These individuals struggle to find alternative coping strategies to relieve such feelings (Rostampour Brenjestanaki et al., 2020). Individuals with poor cognitive flexibility cannot control their emotions effectively (Degirmencioglu Gok et al., 2024; Hasheminejad et al., 2024). Cognitive flexibility plays a crucial role in alleviating psychological stress and anxiety, which often lead to self-harming behaviors. Individuals with self-harming behaviors have difficulty finding solutions to challenging situations due to their lack of cognitive flexibility and inability to consider various options (Sadri Damirchi et al., 2019).

In the context of psychological interventions, self-compassion training has garnered attention from modern therapists in treating specific illnesses (Ros-Morente et al., 2018). In third-wave psychology, self-compassion aims to reduce pain, suffering, worry, depression, stress, and anxiety (Leaviss & Uttley, 2015). According to Neff (2011), self-compassion involves accepting pleasant aspects of oneself and comprises three main elements. First, it entails self-kindness and understanding during moments of personal failure. Second, it involves recognizing that suffering and failure are inevitable parts of the human experience. Lastly, self-compassion entails a balanced awareness of one's emotions, allowing individuals to face painful thoughts and feelings without exaggeration or despair. Self-compassion enables individuals to approach suffering and negative events without harsh self-criticism. Those with high self-compassion accept suffering and experiences as part of life, consciously observing their painful thoughts and feelings (Neff, 2011; Neff & Germer, 2013). People with high self-compassion judge themselves less harshly, accept painful events more readily, base self-evaluations and reactions on actual performance, and experience less anxiety, depression, and physiological problems (Sheivandi et al., 2016). High self-compassion individuals have more appropriate physiological responses to stress and higher emotional well-being (Bluth et al., 2016). High self-compassion also helps individuals respond more adaptively to stressful situations (Finlay-Jones et al., 2015). Self-compassion training can improve difficulties in emotion regulation (Abooei et al., 2021; Borjali et al., 2021) and reduce self-judgment, leading to more adaptive emotion regulation strategies (Jacobson et al., 2018). The mindfulness component of self-compassion can reduce negative emotions (Babakhanlou & Babakhanlou, 2024). Individuals with high self-compassion refrain from self-judgment and self-criticism and experience

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self-acceptance (Gewirtz-Meydan, 2023). Conversely, those with low self-compassion lack the ability to understand their emotions and cannot relate their feelings to memories and imaginations (Afsar et al., 2023). These individuals struggle cognitively to identify their emotions and experience damaging conditions (Dincer et al., 2021). Unlike individuals with high self-compassion, they lack a deep and compassionate understanding of their potential capabilities in managing conflicts and stress (Kord & Karimi, 2017).

Self-compassion training increases an individual's wisdom, helping them understand the futility of self-criticism and promoting self-kindness. High self-compassion enhances the likelihood of achieving desirable outcomes and motivates individuals to take better care of themselves, leading to more positive and pleasant emotional experiences (Zessin et al., 2015). Self-compassion training can increase hope and reduce irrational beliefs (Saleh Abadi & Naemi, 2020). Additionally, self-compassion training can enhance psychological empowerment and security, reducing self-criticism (Cowles et al., 2020). It increases coping and adaptability to changes (Hsieh et al., 2019). Enhancing self-compassion leads to self-respect and improved psychological functioning and mental health. Self-compassion reduces self-harming behaviors and directs individuals towards activities essential for well-being (Khalajzadeh & Hashemi, 2019). Individuals with a history of self-harm are less compassionate towards themselves compared to those without such a history. Conversely, self-compassion acts as a significant protective and flexible factor against self-harm (Gregory et al., 2017). Despite the critical role of self-compassion in preventing self-harming behaviors, most studies on self-harm have focused on the psychological and familial correlates influencing these behaviors, with a notable lack of research on the effectiveness of self-compassion-based interventions. Given the increasing prevalence of self-harming behaviors among adolescents, this study aims to determine the effectiveness of self-compassion training in increasing positive emotion regulation and cognitive flexibility while reducing negative emotion regulation in adolescent girls with self-harming behaviors.

2. Methods and Materials

2.1. Study Design and Participants

The research method was quasi-experimental, using a pre-test, post-test design with a control group and a one-month follow-up period. The statistical population consisted of adolescent girls with self-harming behaviors who referred to the counseling center in District 16 of the Tehran Department of Education in the first six months of 2022. Using purposive sampling and based on the participants' scores on the Klonsky and Glenn (2009) Self-Harm Inventory, 30 individuals with high self-harm scores meeting the inclusion criteria were selected and randomly assigned to a 15-member experimental group receiving self-compassion training and a 15-member control group. Inclusion criteria included adolescent girls aged 12-20 years, with at least one instance of self-harm, no participation in counseling or psychotherapy sessions or psychology workshops in the past six months, no use of psychiatric medications, and completion of the consent form. Exclusion criteria included drug addiction, lack of cooperation in educational sessions, and absence from two consecutive sessions. Ethical considerations included explaining the research objectives and perspectives to participants, obtaining their informed consent to participate, maintaining confidentiality and anonymity of the information and results, and allowing participants to withdraw from the study without negative consequences if they chose not to continue.

Following sample selection, an introductory session was held with all participants at the counseling center of District 16, Tehran Department of Education. The nature of the research, ethical considerations such as confidentiality and anonymity, session hours, and the number of sessions were explained. The self-compassion program was taught to the experimental group in eight weekly sessions in the first six months of 2022. All participants completed the questionnaires before and after the interventions and at the follow-up stage. No participants dropped out, as session attendance rules were clearly explained. To maintain ethical standards, after the research phases, the self-compassion program was conducted in three intensive sessions for the control group.

2.2. Measures

2.2.1. Cognitive Flexibility

Cognitive Flexibility Inventory (CFI): This inventory, developed by Dennis and Vander Wal (2010), consists of 20 items and three subscales: Perception of Alternatives, Perception of Control, and Perception of Justification. It is scored on a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7). A high score indicates high cognitive flexibility. Its correlation with the Beck Depression Inventory is 0.39, and with the Martin Cognitive

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Flexibility Scale is 0.75, demonstrating acceptable concurrent validity. Its reliability, measured by Cronbach's alpha, is 0.91 for the total questionnaire and 0.91, 0.84, and 0.86 for the subscales, respectively. Test-retest reliability scores are 0.81, 0.75, and 0.77, respectively (Dennis & Vander Wal, 2010). In Iran, Cronbach's alpha for the total questionnaire and subscales was 0.89, 0.79, 0.83, and 0.81, respectively (Karbalaie et al., 2021). In the present study, Cronbach's alpha reliability was 0.86.

2.2.2. Cognitive Emotion Regulation

Cognitive Emotion Regulation Questionnaire: Developed by Garnefski and Kraaij (2006), this questionnaire includes 36 items and nine subscales, scored on a 5-point Likert scale from never (1) to always (5). The alpha coefficient for the subscales ranges from 0.71 to 0.81, and the test-retest reliability over a 14-month period ranges from 0.48 to 0.61 (Garnefski & Kraaij, 2006). In Iran, the alpha coefficient for the subscales ranges from 0.62 to 0.91, and test-retest reliability over a one-week interval ranges from 0.75 to 0.88. Content validity was reviewed by psychologists, with Kendall's concordance coefficients for the subscales ranging from 0.81 to 0.92 (Samani & Sadeghi, 2010). In the present study, Cronbach's alpha for positive emotion regulation strategies was 0.85 and for negative emotion regulation strategies was 0.84.

2.3. Intervention

2.3.1. Self-Compassion Training

Gilbert's Self-Compassion Training Program (2014): This program was derived from Gilbert's (2014) book "Self-Compassion," and was conducted in eight 90-minute group sessions, twice a week for the experimental group (Abooei et al., 2021; Diedrich et al., 2016).

Session 1: Introduction and Overview of the Educational Program

In this initial session, participants are introduced to each other to establish a rapport. The group rules are reviewed, and an overview of the session structure and objectives is provided. Pre-tests are administered, and the concept and principles of self-compassion are explained. Participants are assigned the task of listing their sufferings, concerns, and their coping strategies.

Session 2: Mindfulness Training

This session begins with a summary of the previous session and a review of the homework. Participants are introduced to mindfulness exercises such as breathing exercises, object-focused exercises, body scan exercises, and exercises involving eating and touching a raisin. The assignment for this session is to practice these mindfulness exercises at home with precision.

Session 3: Practicing Kindness and Compassion

Feedback from the previous session is discussed, followed by a summary of the previous session. The importance of cultivating a kind mind and feeling warmth and kindness towards oneself is emphasized. Participants engage in role-playing exercises to practice self-kindness and learn styles and methods of expressing compassion using phrases like "I feel safe," "I am kind to myself," and "I let go of stressful thoughts and feelings." Visualization exercises of a safe place are also conducted. Homework includes practicing these exercises and incorporating them into daily life.

Session 4: Finding the Place of Compassion within Oneself

The session begins with a review of the previous session's homework and feedback on the sessions' progress. The focus is on reinforcing self-compassionate behaviors through phrases like "I love you and do not want you to suffer," and practicing receiving kindness from others. The compassionate mind is nurtured further, and the two-chair exercise is introduced. Participants are assigned to repeat these phrases in daily life and practice self-kindness and kindness towards others.

Session 5: Living Deeply

This session starts with a summary of the previous session and a review of the previous homework. Participants provide feedback on the sessions' progress and explore important aspects that give their life meaning. Visualization exercises of a fulfilling and valuable life are conducted, followed by writing a compassionate critique of their life and practicing the metaphor of an ideal day. The homework is to deepen these exercises at home.

Session 6: Managing Difficult Emotions

A summary of the previous session and a review of the homework are provided. Participants discuss the interconnection between the physical, psychological, and mental components of difficult emotions and their impact on each other. Exercises for physical relaxation and mental and emotional calming are introduced, along with logical and compassionate reasoning and sensory compassionate experiences. The homework involves practicing physical and mental relaxation exercises and freeing the mind from negative thoughts.

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Session 7: Changing Relationships

This session includes a summary of the previous session and identifies all painful broken relationships with oneself and others. The groundwork is laid for reconnecting these relationships. Participants practice reconciliation with themselves and discuss the qualities of a compassionate person. The homework is to identify situations where they have been at odds with themselves and practice reconciliation and establishing connections in these three types of relationships.

Session 8: Acceptance and Embracing Life

In the final session, a summary of the previous session is provided. Participants examine negative biases in life and learn to reduce them by focusing on positive aspects and characteristics of life to enjoy it more. The session concludes with final remarks and post-tests. Participants are given strategies to apply this therapeutic approach in their lives.

2.4. Data analysis

Data were analyzed using mixed-design ANOVA with repeated measures and SPSS software version 23.

3. Findings and Results

The mean age and standard deviation of the participants in the experimental group were 16.08 and 2.01 years, respectively, while in the control group, they were 17.02 and 2.09 years. The education levels of the participants in the self-compassion training group were as follows: 20% (3 participants) in eighth grade, 33.33% (5 participants) in ninth grade, 33.33% (5 participants) in eleventh grade, and 13.33% (2 participants) with a high school diploma. In the control group, 26.66% (4 participants) were in eighth grade, 26.66% (4 participants) in tenth grade, 33.33% (5 participants) in twelfth grade, and 20% (3 participants) with a high school diploma.

Table 1

Mean and Standard Deviation of Positive and Negative Emotion Regulation and Cognitive Flexibility Scores (15 participants per group)

Group	Stage	Positive Emotion Regulation	SD	Negative Emotion Regulation	SD	Cognitive Flexibility	SD
Experimental (Self-Compassion Training)	Pre-test	40.20	1.56	68.80	2.24	34.53	3.50
	Post-test	73.66	4.08	26.40	1.68	101.53	4.17
	Follow-up	74.06	4.18	27.06	2.12	101.86	4.29
Control	Pre-test	39.73	1.86	67.65	5.11	33.26	5.63
	Post-test	39.20	2.00	66.66	5.00	33.26	14.23
	Follow-up	38.66	2.22	67.00	4.73	33.33	5.78

According to Table 1, the participants' scores in the pre-test stage were nearly similar, but they changed in the post-test and follow-up stages.

Table 2

Results of Mauchly's Test of Sphericity, Shapiro-Wilk Normality Test, and Levene's Test of Homogeneity of Variances

Variable	Mauchly's W	Chi-square	Shapiro-Wilk W	Z	Levene's F	p
Positive Emotion Regulation	0.41	52.67	0.99	3.32	0.28	0.28
Negative Emotion Regulation	0.51	55.43	0.95	3.48	0.31	0.31
Cognitive Flexibility	0.66	57.23	0.98	3.32	0.47	0.47

In Table 2, the results of the Shapiro-Wilk test indicate that the assumption of normal distribution of data is met. The results of Levene's test indicate that the assumption of homogeneity of variances is met, and the non-significant results of M. Box and Mauchly's tests indicate that the assumptions of homogeneity of covariance matrices and equality of within-subject variances are met.

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Table 3

Summary of Mixed ANOVA Results with Repeated Measures

Variable	Source of Variation	Sum of Squares	df	Mean Square	F	Eta Squared
Positive Emotion Regulation	Within-Subjects (Stages)	5401.15	2, 27	2700.57	68.77**	0.66
	Between-Subjects (Intervention)	12366.94	1, 28	12366.94	74.85**	0.58
	Interaction (Stages * Intervention)	5943.02	1, 27	5943.02	75.17**	0.55
Negative Emotion Regulation	Within-Subjects (Stages)	9130.68	2, 27	4288.23	85.45**	0.57
	Between-Subjects (Intervention)	12744.90	1, 28	12744.90	26.76**	0.62
	Interaction (Stages * Intervention)	8576.46	1, 27	8576.46	32.21**	0.53
Cognitive Flexibility	Within-Subjects (Stages)	22467.35	2, 27	11233.67	61.03**	0.58
	Between-Subjects (Intervention)	47886.40	1, 28	47886.40	57.41**	0.56
	Interaction (Stages * Intervention)	22647.80	1, 27	20614.89	54.37**	0.61

The results in Table 3 show that the between-group, within-group, and interaction effects across the three stages are significant (P<0.01). In other words, self-compassion training has been able to increase positive emotion regulation and cognitive flexibility and decrease negative emotion regulation (P<0.01).

Table 4

Results of Bonferroni Post Hoc Test

Stages	Variable	S.E	Mean Diff.
Pre-test - Post-test	Positive Emotion Regulation	0.61	-16.46**
Pre-test - Follow-up		0.63	-16.40**
Post-test - Follow-up		0.10	0.067
Pre-test - Post-test	Negative Emotion Regulation	0.41	21.36**
Pre-test - Follow-up		0.44	21.36**
Post-test - Follow-up		0.17	7.10
Pre-test - Post-test	Cognitive Flexibility	0.70	-33.50**
Pre-test - Follow-up		0.72	-33.53**
Post-test - Follow-up		0.18	-0.03

**p<0.01

According to the results in Table 4, the mean differences between the pre-test and post-test, and between the pre-test and follow-up stages are significant, indicating the interventions' impact on increasing positive emotion regulation and cognitive flexibility and decreasing negative emotion regulation, with these effects persisting at the follow-up stage.

4. Discussion and Conclusion

The results of the study indicate the effectiveness of self-compassion training in increasing positive emotion regulation and decreasing negative emotion regulation in girls with self-harming behavior. This change persisted for one month. This finding is consistent with the results of prior studies by (Abooei et al., 2021; Borjali et al., 2021; Hsieh et al., 2019; Jacobson et al., 2018; Kord & Karimi, 2017).

Since self-compassion functions as a positive psychological trait to improve conditions, accept abilities, and enhance psychological well-being, individuals who receive self-compassion training typically benefit from higher self-kindness, a sense of common humanity, and mindfulness. These individuals are more efficient in regulating and balancing emotions and usually employ positive and adaptive strategies when dealing with life's challenges and stressful conditions. Additionally, self-compassion training prevents the emergence of negative emotions such as anxiety and stress (Neff & Germer, 2017). Moreover, self-compassion training improves difficulties in emotion regulation (Borjali et al., 2021).

Self-compassion training is not merely a psycho-educational method; it also encompasses interventions that can reduce pain and suffering and foster positive traits such as mindfulness, insight, wisdom, and empathy. Therefore, self-compassion training for girls with a history of self-harming behavior can enhance emotional coherence and new adaptive behaviors, generally increasing positive emotion

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regulation strategies (DashtBozorgi, 2018). Self-compassion training also enhances individuals' ability to cope effectively with stress and adapt to challenging life situations. Since self-compassion training increases hope and effective response to change, individuals eventually tend to use more positive emotion regulation strategies in their lives (Hsieh et al., 2019). When individuals' self-compassion levels increase, non-judgmental awareness of their thoughts and feelings expands, leading them to use more adaptive emotion regulation strategies (Jacobson et al., 2018). Thus, self-compassion training can facilitate the use of positive and change-focused emotion regulation strategies such as cognitive reappraisal, helping individuals focus on planning and increasing emotional acceptance. On the other hand, self-compassion training encourages individuals to accept their negative emotions compassionately rather than avoiding them (Neff, 2011; Neff & Germer, 2013). This approach helps individuals experience both negative and positive emotions, promoting the conscious experience of a wide range of emotions and using more adaptive emotion regulation strategies in crisis situations (Krieger et al., 2015). For adolescents with self-harming behavior, self-compassion training helps them take better care of themselves when facing life's difficulties and stresses, thereby enhancing their psychological well-being. Additionally, self-compassion training increases positive self-feelings, self-awareness, a non-judgmental attitude towards failures, and acceptance of suffering and failure as part of life, fostering the belief that all humans deserve kindness and compassion. Self-compassion training leads to non-reactive acceptance of both pleasant and unpleasant experiences. It helps adolescents with self-harming behavior control themselves without self-blame when observing unpleasant experiences, reducing the intensity and duration of their stress through emotion regulation and diverting their attention from negative emotions, which ultimately reduces high-risk behaviors. Therefore, self-compassion training helps girls with self-harming behavior use adaptive and positive strategies when facing stress, worries, and life's challenges. It also reduces negative emotion regulation, consistent with the prior findings (Dincer et al., 2021; Neff, 2011; Wenn et al., 2019).

Self-compassion training strengthens a compassionate attitude towards oneself, helping individuals overcome negative emotions through this feeling. Individuals with higher self-compassion experience fewer negative emotions when faced with unpleasant events, especially those involving evaluation and social comparison, by normalizing the experience. The mindfulness component in the self-compassion training program helps prevent the formation of pessimistic thoughts and obsessive ruminations (Neff, 2011; Neff & Germer, 2013). Since a significant portion of negative emotions experienced by individuals stems from ruminations following negative experiences, the mindfulness component in the self-compassion training program reduces negative emotions by decreasing rumination (Saleh Abadi & Naemi, 2020). Additionally, self-compassion training promotes kindness, self-understanding, avoidance of harsh self-criticism, and non-judgmental attitudes towards others. Self-compassion training for girls with self-harming behavior alleviated psychological distress from negative experiences and self-threatening emotions while enhancing understanding of the nature of their distress, worry, and loneliness, encouraging positive responses, smiles, empathy, and intimacy. Therefore, the self-compassion training program helps individuals combat destructive self-criticism and approach their emotions with greater calm and composure (Neff & Germer, 2013). In the self-compassion training program, individuals experience fewer negative emotions when facing real negative events, recalling past negative events, and imagining fictional negative events, facilitating their ability to cope with negative emotions. Individuals with high self-compassion are more likely to accept their role and responsibility in negative events, ruminate less, and thus experience fewer negative emotions, depression, anxiety, and stress when confronting their mistakes (Wenn et al., 2019). Self-compassion training likely increases individuals' ability to delay unpleasant emotions, engage in or manage negative emotions, and rationally control emotions, reducing self-critical thoughts and unpleasant feelings. Self-compassion training can improve emotional coherence, adopt new adaptive behaviors, and enhance emotion regulation. Individuals with high self-compassion are more willing to accept their role and responsibility in negative events, ruminate less, and consequently experience fewer negative emotions when confronting mistakes. Self-compassion training facilitates emotional change to provide more self-care and support, increases the ability to accept discomforts, and reduces emotional distress (Finlay-Jones et al., 2015). According to Gregory et al. (2017), self-compassion can increase resilience and cognitive emotion regulation by reducing rumination. Since self-compassion requires mindful awareness of emotions, individuals with high self-compassion do not avoid painful and distressing feelings but approach them with greater kindness and

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understanding. Negative emotions transform into more positive feelings, giving individuals the opportunity to understand conditions more accurately and choose effective actions to change themselves or their circumstances, thereby increasing their tolerance and emotional management capabilities. Therefore, self-compassion training for girls with self-harming behavior can reduce their negative emotions (Gregory et al., 2017).

Furthermore, the study concluded that self-compassion training can increase cognitive flexibility in girls with self-harming behavior, consistent with the prior findings (Dincer et al., 2021; Khalajzadeh & Hashemi, 2019; Rostampour Brenjestanaki et al., 2020; Saleh Abadi & Naemi, 2020; Waring & Kelly, 2019). Since self-compassion-based interventions can enhance coping, problem-solving, and hypothesis-forming abilities, they help adolescent girls with self-harming behavior better face and adapt to their new situations, improving their tolerance. Enhancing self-compassion leads to overlooking failures and weaknesses and respecting oneself as a human being, which researchers deem essential for optimal psychological functioning and mental health improvement. In fact, having self-compassion requires abandoning self-destructive behaviors and encouraging individuals to engage in activities essential for their well-being (Khalajzadeh & Hashemi, 2019). The self-compassion training program increases participants' cognitive flexibility, enabling them to use alternative options, positively reconstruct their mental framework, and accept challenging situations or stressful events. It also enhances individuals' ability to adapt to negative emotional experiences in the present and cope with disruptive and restrictive events (Waring & Kelly, 2019). Therefore, adolescent girls with self-harming behavior who participate in the self-compassion training program will see an increase in cognitive flexibility, allowing them to manage challenging and stressful life situations more effectively. Low cognitive flexibility often leads to self-blaming and self-critical behaviors. The self-compassion training program positively increases cognitive flexibility and the process of non-judgmental acceptance of experiences, thoughts, and feelings. Since the self-compassion training program enhances mindfulness, it involves stepping outside oneself, observing experiences from a higher perspective, making the experience appear more objective and profound, preventing excessive focus on the distressing issue and continuous pursuit of it (over-identification process). This helps individuals stop self-judgment and self-criticism, experience self-acceptance, and gain balanced awareness of their thoughts and emotions (Waring & Kelly, 2019). Considering the educational discussions and exercises for cultivating a compassionate mind, mindfulness practice, intentional thinking exercises, training in wisdom and empathy, ways to forgive and control breathing, individuals can better control their emotions and develop greater flexibility. A positive outlook on the future is the most significant benefit of self-compassion, and self-compassion intervention influences increasing optimism and life hope in individuals regarding their abilities when facing challenging situations, possibly because this approach reduces self-judgment and fosters a sense of competence. In general, individuals with self-compassion are more optimistic and better able to cope with their negative emotions, exhibiting greater flexibility (Dincer et al., 2021). Furthermore, self-compassion-based training facilitates emotional change to provide more self-care and support, enhances the ability to accept concerns, reduces emotional distress, and increases cognitive flexibility (Bluth et al., 2016).

5. Limitations & Suggestions

Overall, this study concluded that self-compassion training for girls with self-harming behavior could increase the use of positive emotion regulation strategies and cognitive flexibility while decreasing the use of negative emotion regulation strategies. Since the adolescent girls participating in the present study have different etiologies for self-harming behavior and typically possess diverse cognitive, emotional, behavioral characteristics, and family conditions, these features may have influenced the study's results. Thus, there are limitations in generalizing the findings, interpretations, and causal attributions of variables, suggesting that future research on girls with self-harming behavior should consider the role of the etiological factors of self-harming behavior and cognitive, emotional, behavioral characteristics, and family conditions. Additionally, given the effectiveness of the self-compassion training program on girls with self-harming behavior, it is recommended to use the self-compassion program to increase the use of positive emotion regulation strategies and cognitive flexibility by girls with self-harming behavior and reduce the use of negative emotion regulation strategies in this group of girls.

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Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors contributed equally.

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