

Effect of Acceptance and Commitment Therapy on Emotion Regulation in Adolescent Patients with Nonsuicidal Self-Injury

ABSTRACT

Objective: This study aimed to explore the effect of acceptance and commitment therapy (ACT) on emotion regulation in adolescent patients with nonsuicidal self-injury (NSSI).

Methods: A total of 72 adolescent patients with NSSI were selected as research subjects from June 2022 to May 2023 for retrospective analysis. They were divided into control group (CG) and experimental group (EG) in accordance with different management methods. CG received routine psychological support treatment, whereas EG was given ACT management on the basis of routine psychological support. The clinical management effects of the 2 groups were compared.

Results: At the end of week 6 (T1) and the end of week 12 (T2), the EG had significantly higher scores of positive emotion regulation and cognitive fusion questionnaire-fusion (CFQ-F) ($P < .05$). However, they had significantly lower scores on the negative emotion regulation, behavior questionnaire, function questionnaire, and adolescent self-rating life events checklist (ASLEC) than the CG ($P < .05$).

Conclusion: Acceptance and commitment therapy can effectively regulate the emotional state of adolescent patients with NSSI, improve psychological flexibility, reduce the effectiveness of self-injury behavior, and help such adolescents acquire the correct values in life.

Keywords: Acceptance and commitment therapy, emotion regulation, nonsuicidal self-injury in adolescents

Introduction

Nonsuicidal self-injury (NSSI) refers to behavior in which an individual directly, intentionally, and repeatedly injures his or her body tissue without a clear suicidal intention, which is not accepted and recognized by the society.¹ NSSI is common in adolescents, usually in mid-adolescence (about 14-16 years old),² and manifests as scratching the skin, cutting the wrist, pulling the hair, banging the head, and scalding.³ Adolescent NSSI behavior is a worldwide concern, and its incidence varies widely among different countries and regions. Indeed, it has become a social public-health problem affecting the mental health of adolescents.⁴ At present, the treatment of NSSI behavior in China and abroad is primarily psychotherapy. The most common is cognitive behavioral therapy, which aims to alleviate adverse emotions by improving cognition, but it often only has short-term efficacy. Data show that the overall detection rate of NSSI among middle-school students in mainland China is 27.4%,⁵ so a more effective way to regulate emotions and thus reduce NSSI behavior in adolescents needs to be identified. Foreign scholars have considered that NSSI behavior is aimed at releasing and managing adverse emotions, followed by controlling and influencing others.⁶ Therefore, paying more attention to adolescent NSSI behavior and seeking effective treatment measures are important to promote the physical and mental health development of adolescents.

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Acceptance and commitment therapy (ACT) is developed on the basis of traditional cognitive behavioral therapy, which is the third wave of cognitive behavioral therapy.⁷ Acceptance and commitment therapy, which combines acceptance and mindfulness with traditional cognitive therapy, inherits and innovates cognitive behavioral therapy. Acceptance and commitment therapy has recently been used to treat anxiety disorders⁸ and has been shown to be an appropriate psychological management tool that may alleviate the symptoms of adolescents with social anxiety disorder, thereby improving their psychological flexibility. The goal of ACT is to cultivate the ability to accept thoughts and feelings, reduce experiential avoidance, enhance psychological flexibility, and increase effective value-based actions. Psychological flexibility is a protective factor for mental health and has great importance in promoting the mental health of adolescents. Through ACT, patients learn to commit themselves to confronting problems rather than avoiding stress, to take actions that enhance their experiences, and to face current challenges calmly. Therefore, ACT management can guide patients with NSSI to live rightly, but whether it can reduce NSSI behavior remains subject for discussion. The present study analyzed the effect of ACT on the emotion regulation of adolescent patients with NSSI, explored its clinical significance and mechanism, and provided new ideas for the clinical treatment of NSSI.

Material and Methods

Research Subjects

This study was a retrospective control one. According to different management methods, 36 patients in a control group (CG) were treated with routine psychological support, and 36 patients in an experimental group (EG) were treated with ACT management on the basis of CG. The technical route is presented in Figure 1.

Inclusion and Exclusion Criteria

The inclusion criteria were as follows: (1) Patients met the NSSI diagnostic criteria in Diagnostic and Statistical Manual of Mental Disorders (DSM-5).⁹ (2) Patients were 13-18 years old. (3) Patients were treated with selective serotonin reuptake inhibitors.

The exclusion criteria were as follows: (1) Patients participated in other psychotherapies. (2) Patients were treated with physical therapy. (3) Patients had a severe somatic illness. (4) Patients had mental disorders and mental retardation caused by brain organic diseases. The CG received routine psychological support. The medical staff introduced NSSI behavior's definition, etiology, and harm to individuals, families, and society. They also discussed common manifestations and adjustment methods, the necessity and importance of medication to guide patients and carry out objective self-knowledge and self-evaluation, ask for help, express inner thoughts, and release adverse emotions through various forms of catharsis, such as exercise.

MAIN POINTS

- Acceptance and commitment therapy (ACT) alleviates the self-injury awareness of nonsuicidal self-injury (NSSI) patients and reduces the occurrence of self-injury behavior.
- Acceptance and commitment therapy effectively regulates the inner emotions of adolescent patients with NSSI.
- Acceptance and commitment therapy improves the psychological flexibility of NSSI patients.

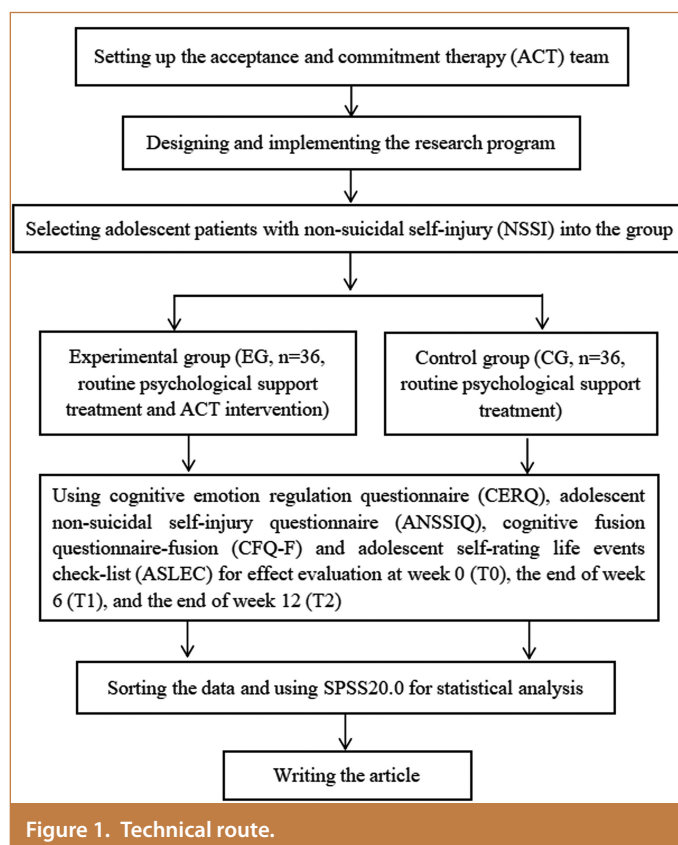


Figure 1. Technical route.

The EG received ACT management on the basis of CG, with a total of 9 courses for 60 minutes and 6-8 patients as a group. The management time was 6 weeks. The management contents are shown in Table 1.

Evaluation Indicators

General Data: The general data of age, gender, and learning stage, whether the only child or not, and family status was compared between the 2 groups.

Cognitive Emotion Regulation

The cognitive emotion regulation questionnaire (CERQ)¹⁰ comprises 36 items. It adopts Likert 5-level scoring criteria, with a score of 1-5 points. The questionnaire was divided into 9 subscales and 2 general dimensions of positive emotion regulation (acceptance, positive attention, etc., with a score of 20-100 points) and negative emotion regulation (self-blame, contemplation, etc., with a score of 16-80 points). A higher score in each subdimension corresponded with more emotional strategies used in this subdimension.

Adolescent Nonsuicidal Self-Injury Behavior

The adolescent NSSI questionnaire (ANSSIQ)¹¹ comprises 2 parts, namely, the behavior questionnaire (12 items) and the function questionnaire (19 items). Both use Likert 5 scoring criteria, with a score of 0-4 points. A higher score corresponds with more serious NSSI behavior.

Cognitive Fusion

The Chinese version of the cognitive fusion questionnaire (CFQ)¹² contains 13 items and is divided into 2 subquestionnaires: CFQ-fusion (CFQ-F) and CFQ-defusion (CFQ-D). This study selected the Chinese

Table 1. Acceptance and Commitment Therapy Management Courses

Time	Courses	Contents
Week 1 (Hello, friend)	Course 1	At first, the adolescent patients introduced themselves. Through the group activity “snowball”, the members became familiar with one another, formed a team spirit, and established an equal treatment alliance and a relationship of mutual trust. The medical staff clarified the specific steps and application effects of ACT treatment.
Week 2 (Acceptance)	Course 1 (Share emotions)	1. Adolescent patients shared their own problems and emotional feelings and then pointed out the ineffective results caused by adverse coping styles. 2. Medical staff reduced patients’ dependence on control strategies, introduced the benefits of acceptance and the harm of escape, and guided patients to produce positive responsiveness toward accepting the present self.
	Course 2 (Accept adverse emotions)	1. The medical staff instructed the adolescent patients to watch the film “To Live” and talked about the connotation of acceptance. In this way, the adolescent patients understood that pain was a necessary process in life, life remained full of hope, and people should accept the existence of pain and live a positive life. 2. Medical staff led the participants to practice mindfulness breathing for 15 minutes and perceive the current situation.
Week 3 (Attention to the present)	Course 1	Patients carried out the raisin-meditation exercise to share the size, color, and taste of the raisins. They enjoyed the care of family and guidance of medical staff and expressed their inner feelings and thoughts to improve effective awareness of the present moment, as well as actively focus on life.
Week 4 (Cognitive defusion)	Course 1 (Make friends with oneself)	1. Patients shared their feelings about last week’s informal mindfulness exercise in 5 minutes. 2. Medical staff used the defusion technique to help the participants understand the ideas in the brain and keep away from unreasonable cognition. Through group games, medical staff explained the difference between individual cognition and objective facts. They helped patients face their own psychological problems intuitively and control their behaviour positively.
	Course 2 (Recognize the self)	Medical staff guided participants to objectively observe, evaluate, and feel their own psychological and behavioral changes. They helped the participants recall and share successful experiences in overcoming difficulties and perceive the current real situation. Finally, medical staff used meditation training to help patients perceive themselves and recognize their new self in 15 minutes.
Week 5 (Clear value proposition, and commitment)	Course 1 (Establish values)	1. Through the game of “compass”, the concept of value was introduced to explain the importance of establishing clear values in life. 2. Adolescent patients discussed the expectation of future life, starting from small things to finding the direction of their lives, and enhanced positive emotions with positive values. The task assigned by medical staff to patients was to do something positive and valuable.
	Course 2 (Make commitments)	The medical staff told the story of “stepping on a nail”, such that the participants accepted the existence of the “nails” (bad emotional life events). They shifted their attention from the nail to the distance they wanted to go. Finally, each participant was encouraged to make a commitment that was conducive to the condition, as well as to formulate short-, medium-, and long-term goals.
Week 6 (Embrace)	Course 1	Experience-exchange meetings were organized to share the process and experience of inner-thought transformation and to evaluate the therapeutic effect. The patients promised to adhere to the promised action plan after discharge. Finally, team members blessed and hugged one another.

version of CFQ, retaining only 9 items in CFQ-F. We deleted 4 items in CFQ-D because they failed to meet the measurement indices. Each item was scored 1-7 points, and a higher score corresponded with a higher degree of cognitive fusion.

Adolescent Life Events

The adolescent self-rating life events checklist (ASLEC)¹³ comprises 27 items, including 5 dimensions (punishment, loss, interpersonal stress, etc.). This scale uses Likert 5 scoring criteria, with a score of 1-5 points, and a higher score corresponds with a greater frequency and intensity of stressful life events.

Ethics Committee Approval

This study conformed to the principles of the Declaration of Helsinki (2013).¹⁴ This study has been approved by the Ethical Committee of Hangzhou Seventh People’s Hospital (Approval No: 2023004). As a retrospective study, it is not necessary to obtain informed consent of patients.

Statistical Analysis

Data in both groups was statistically processed using Statistical Package for the Social Sciences Statistics, version 22.0 (IBM SPSS

Table 2. Comparison of General Data in Both Groups

Items	CG (n = 36)	EG (n = 36)	P
Average age [mean (SD), years]	15.31 (SD = 1.75)	15.17 (SD = 1.48)	.886
Gender			.808
Male	22 (61.11)	23 (63.89)	
Female	14 (38.89)	13 (36.11)	
Learning stage			.867
Middle school	19 (52.78)	18 (50.00)	
High school/special secondary school	11 (30.56)	13 (36.11)	
University	6 (16.67)	5 (13.89)	
Whether the only child or not			.812
Yes	16 (44.44)	15 (41.67)	
No	20 (55.56)	21 (58.33)	
Family status			.808
Single-patient family	23 (63.89)	22 (61.11)	
Two-patient family	13 (36.11)	14 (38.89)	

CG, control group; EG, experimental group.

Corp.; Armonk, NY, USA), and GraphPad Prism 7 (San Diego, CA, USA) was used for picture drawing.

To compare basic data between the 2 groups, the enumeration and measurement data were tested by the χ^2 test and *t*-test, expressed as [n(%)] and ($\bar{x} \pm SD$), respectively. *P* < .05 indicated that the difference was statistically significant.

Results

General Data

No significant difference in general data existed between the 2 groups (*P* > .05), as shown in Table 2.

Cognitive Emotion Regulation

At the end of week 6 (T1) and the end of week 12 (T2), the scores of positive emotion in the 2 groups were significantly higher than those at week 0 (T0). The scores of negative emotion were significantly lower than those at T0 (*P* < .001), as shown in Table 3. At T0, both groups had no significant difference in the scores of positive emotion and negative emotion (*P* > .05). At T1 and T2, the EG had overtly higher scores of positive emotion (*P* < .05) and remarkably lower scores of negative emotion (*P* < .001). In terms of comparison of the difference scores between the 2 groups, the EG had a higher difference in positive emotion at T0–T2 (*P* < .001), and a higher difference in negative emotions at T0–T1 and T0–T2 than the CG (*P* < .001), as shown in Table 4.

Adolescent Nonsuicidal Self-Injury Behavior

The ANSSIQ scores of the 2 groups at T1 and T2 were significantly lower than those at T0 (*P* < .05), as shown in Table 5. At T0, no significant difference in ANSSIQ scores existed between the 2 groups (*P* > .05). At T1 and T2, the EG had significantly lower scores of the behavior questionnaire and function questionnaire than the CG (*P* < .001). In terms of comparison of the difference scores between the 2 groups, the EG had a higher difference of behavior questionnaire in T0–T2 (*P* > .05) and higher difference of function questionnaire at T0–T1 and T0–T2 than the CG (*P* < .001), as shown in Table 6.

Table 3. Comparison of Cognitive Emotion Regulation Questionnaire Scores within Groups ($\bar{x} \pm SD$)

Groups		CG (n = 36)	EG (n = 36)
Positive emotion	T0	37.78 (SD = 5.92)	37.33 (SD = 6.50)
	T1	48.39 (SD = 5.78)	51.61 (SD = 5.28)
	<i>t</i>	−7.330	−10.321
	<i>P</i>	<.001	<.001
	T0	37.78 (SD = 5.92)	37.33 (SD = 6.50)
	T2	54.89 (SD = 8.82)	70.47 (SD = 8.71)
Negative emotion	<i>t</i>	−8.544	−17.169
	<i>P</i>	<.001	<.001
	T0	67.72 (SD = 6.07)	68.08 (SD = 4.84)
	T1	55.21 (SD = 7.11)	46.39 (SD = 6.60)
	<i>t</i>	9.038	15.636
	<i>P</i>	<.001	<.001
	T0	67.72 ± 6.07	68.08 ± 4.84
	T2	43.81 ± 6.54	33.72 ± 7.14
	<i>t</i>	17.959	21.527
	<i>P</i>	<.001	<.001

CG, control group; EG, experimental group.

Table 4. Comparison of Cognitive Emotion Regulation Questionnaire Scores Between Groups [mean (SD)]

Groups		CG (n = 36)	EG (n = 36)	<i>t</i>	<i>P</i>
Positive emotion	T0	37.78 (SD = 5.92)	37.33 (SD = 6.50)	0.303	.763
	T1	48.39 (SD = 5.78)	51.61 (SD = 5.28)	2.470	.016
	T2	54.89 (SD = 8.82)	70.47 (SD = 8.71)	7.541	<.001
	Difference score 1	10.61 (SD = 8.69)	14.28 (SD = 8.30)	1.831	.071
Negative emotion	Difference score 2	17.11 (SD = 12.02)	33.14 (SD = 11.58)	5.762	<.001
	T0	67.72 (SD = 6.07)	68.08 (SD = 4.84)	0.279	.781
	T1	55.21 (SD = 7.11)	46.39 (SD = 6.60)	5.501	<.001
	T2	43.81 (SD = 6.54)	33.72 (SD = 7.14)	6.247	<.001
	Difference score 1	−12.44 (SD = 8.26)	−21.69 (SD = 8.32)	4.732	<.001
	Difference score 2	−23.92 (SD = 7.99)	−34.36 (SD = 9.58)	5.024	<.001

Difference score 1 = T1 – T0, difference score 2 = T2 – T0.

CG, control group; EG, experimental group.

Cognitive Fusion

The CFQ-F scores of the 2 groups at T1 and T2 were significantly higher than those at T0 (*P* < .05), as shown in Table 7. At T0, no overt difference in CFQ-F scores existed between the 2 groups (*P* > .05). At T1 and T2, the EG had distinctly higher CFQ-F scores than the CG (*P* < .001). In terms of comparison of the difference scores between the 2 groups, the EG had a higher difference of CFQ-F scores at T0–T1 and T0–T2 than the CG (*P* < .001), as shown in Table 8.

Adolescent Life Events

The ASLEC scores of the 2 groups at T1 and T2 were significantly lower than those at T0 (*P* < .05), as shown in Table 9. At T0, no significant difference in ASLEC scores existed between the 2 groups (*P* > .05). At T1 and T2, the EG had obviously lower ASLEC scores than the CG (*P* < .001). Moreover, the EG had higher ASLEC scores at T0–T1 and T0–T2 than the CG (*P* < .001), as shown in Table 10.

Table 5. Comparison of Adolescent Nonsuicidal Self Injury Questionnaire Scores within Groups [mean (SD)]

Groups		CG (n = 36)	EG (n = 36)
Behavior questionnaire	T0	33.14 (SD = 6.74)	32.47 (SD = 6.65)
	T1	27.42 (SD = 6.02)	23.89 (SD = 6.09)
	<i>t</i>	3.290	5.645
	<i>P</i>	.002	<.001
	T0	33.14 (SD = 6.74)	32.47 (SD = 6.65)
	T2	25.92 (SD = 6.97)	20.75 (SD = 5.91)
Function questionnaire	<i>t</i>	4.402	7.884
	<i>P</i>	<.001	<.001
	T0	60.22 (SD = 6.56)	59.97 (SD = 6.78)
	T1	50.72 (SD = 7.29)	44.83 (SD = 5.05)
	<i>t</i>	5.831	11.033
	<i>P</i>	<.001	<.001
	T0	60.22 (SD = 6.56)	59.97 (SD = 6.78)
	T2	42.72 (SD = 6.10)	31.11 (SD = 5.66)
	<i>t</i>	10.582	17.621
	<i>P</i>	<.001	<.001

CG, control group; EG, experimental group.

Table 6. Comparison of Adolescent Nonsuicidal Self Injury Questionnaire Scores Between Groups [mean (SD)]

Groups		CG (n = 36)	EG (n = 36)	t	P
Behavior questionnaire	T0	33.14 (SD=6.74)	32.47 (SD=6.65)	0.423	.674
	T1	27.42 (SD=6.02)	23.89 (SD=6.09)	2.473	.016
	T2	25.92 (SD=6.97)	20.75 (SD=5.91)	3.392	.001
	Difference score 1	-5.72 (SD=10.44)	-8.58 (SD=9.12)	1.239	.220
	Difference score 2	-7.22 (SD=9.84)	-11.72 (SD=8.92)	2.032	.046
Function questionnaire	T0	60.22 (SD=6.56)	59.97 (SD=6.78)	0.159	.874
	T1	50.72 (SD=7.29)	44.83 (SD=5.05)	3.986	<.001
	T2	42.72 (SD=6.10)	31.11 (SD=5.66)	8.377	<.001
	Difference score 1	-9.50 (SD=7.78)	-15.14 (SD=8.23)	2.647	.010
	Difference score 2	-17.50 (SD=9.92)	-28.86 (SD=9.83)	4.881	<.001

Difference score 1 = T1–T0, difference score 2 = T2–T0.
CG, control group; EG, experimental group.

Table 7. Comparison of CFQ-F scores within groups [mean (SD)]

Groups	CG (n = 36)	EG (n = 36)
T0	15.83 (SD=4.07)	16.47 (SD=4.28)
T1	26.33 (SD=4.17)	32.31 (SD=5.05)
t	10.710	15.916
P	<.001	<.001
T0	15.83 (SD=4.07)	16.47 (SD=4.28)
T2	37.44 (SD=5.47)	44.97 (SD=6.24)
t	17.432	25.804
P	<.001	<.001

CG, control group; EG, experimental group; CFQ-F: cognitive fusion questionnaire-fusion.

Table 8. Comparison of Cognitive Fusion Questionnaire-Fusion scores Between Groups [mean (SD)]

Groups	CG (n = 36)	EG (n = 36)	t	P
T0	15.83 (SD=4.07)	16.47 (SD=4.28)	0.629	.518
T1	26.33 (SD=4.17)	32.31 (SD=5.05)	5.474	<.001
T2	37.44 (SD=5.47)	44.97 (SD=6.24)	5.443	<.001
Difference score 1	10.50 (SD=5.88)	15.83 (SD=5.97)	3.819	<.001
Difference score 2	21.61 (SD=7.44)	28.50 (SD=6.63)	4.149	<.001

Difference score 1 = T1–T0, difference score 2 = T2–T0.
CG, control group; EG, experimental group.

Discussion

Nonsuicidal self-injury patients damage their own bodies through cutting, collision, scratching, biting, or scalding to alleviate their inner uneasiness. Without management, NSSI greatly harms physical and mental health, seriously affecting the quality of life. Cognitive behavioral therapy can regulate the psychological emotion of patients by changing their cognition. In the short term (within 6 months), it can reduce suicidal ideation, reduce the risk of suicide and self-injury behavior, and improve negative emotions such as anxiety and depression.^{15,16} However, the long-term effect is not significant. Therefore, identifying a more effective emotional regulation program to reduce the treatment of adolescent NSSI behavior is highly critical. ACT improves the psychological flexibility of NSSI patients through acceptance, cognitive dissociation, and attention to

Table 9. Comparison of ASLEC scores within groups [mean (SD)]

Groups	CG (n = 36)	EG (n = 36)
T0	108.00 (SD=9.49)	107.67 (SD=10.27)
T1	88.61 (SD=7.07)	76.06 (SD=8.54)
t	9.068	-12.113
P	<.001	<.001
T0	108.00 (SD=9.49)	107.67 (SD=10.27)
T2	67.72 (SD=7.70)	54.08 (SD=8.76)
t	19.336	20.757
P	<.001	<.001

ASLEC, Adolescent Self-rating Life Events Check-List; CG, control group; EG, experimental group.

Table 10. Comparison of Adolescent Self-rating Life Events Check-List Scores Between Groups [mean (SD)]

Groups	CG (n = 36)	EG (n = 36)	t	P
T0	108.00 (SD=9.49)	107.67 (SD=10.27)	0.143	.887
T1	88.61 (SD=7.07)	76.06 (SD=8.54)	6.793	<.001
T2	67.72 (SD=7.70)	54.08 (SD=8.76)	7.013	<.001
Difference score 1	-19.39 (SD=12.83)	-31.61 (SD=15.66)	3.623	.001
Difference score 2	-40.28 (SD=12.50)	-53.58 (SD=15.49)	4.011	<.001

Difference score 1 = T1–T0, difference score 2 = T2–T0.
CG, control group; EG, experimental group.

the present. As a result, patients can achieve their own goals through more healthy and effective behaviors such as mindful connection, self-perception, and future imagination. Therefore, ACT is expected to reduce the occurrence of NSSI behavior.

Acceptance and commitment therapy was founded by American psychologist Hayes et al in the 1990s.¹⁷ It is a third-generation contextualism-oriented behavioral therapy that expands the existing cognitive behavioral therapy integrates the connotation of Oriental philosophy, and creatively draws on the concepts of dialectics, spirituality, relationship, and mindfulness.¹⁸ The ACT also maintains an open attitude towards negative and irrational psychological events; that is, patients treat various experiential avoidances with an acceptable attitude and subsequently implement actions on the basis of the existence of pain. The data of this study showed that the EG had overtly higher scores of positive emotion regulation and remarkably lower scores on negative emotion regulation than the CG at T1 and T2, indicating that ACT effectively regulated the cognitive emotion of adolescent patients with NSSI. Meanwhile, the EG had significantly lower scores of the behavior questionnaire and function questionnaire than the CG at T1 and T2, manifesting that ACT reduced adolescent NSSI behavior. A foreign study has revealed that the implementation of ACT in veterans can effectively reduce their depression and suicidal ideation,¹⁹ similar to the results of this study. The reason may be that experiential avoidance is the most common way to deal with problems for adolescent patients with NSSI. Experiential avoidance is a potential mechanism,²⁰ meaning that individuals reduce the form or frequency of negative experiences in various ways. Avoidance strengthens the connection to a negative experience, causing individuals to be trapped in an endless cycle. Avoiding problems does not fundamentally solve the problem and affects the ability to take effective behavior in the face of problems, resulting in an increased response rate for bad behavior.²¹ Acceptance in ACT is a coping style opposite to experiential avoidance. It means that individuals actively and consciously accept their

past negative experiences, making no futile attempt to change the frequency and form of those experience. As a positive and positive behavioral coping method, ACT can encourage adolescent patients to accept adverse experiences, guide them to face the problems and harm of negative emotions in life, and destroy the thinking reiteration process of negative emotions.²² The outcome is reduced self-injury consciousness and behavior in NSSI patients.

During the ACT treatment process, a series of exercises were used to help adolescent patients with NSSI break free from a conceptualized past and a fearful future, thereby strengthening patients' self-awareness²³ and focusing on how thinking affects behavior and promotes psychological flexibility.²⁴ Self-injured individuals may experience more stereotypes and severe cognitive fusion than normal individuals, leading to psychological inflexibility. Thus, nursing staff can use dissociation technology to make patients understand that the negative thoughts lingering in their minds are only ideas, not the real situation. The data of this study showed that the CFQ-F scores of the EG were significantly higher than those of the CG at T1 and T2, indicating that ACT contributed to cognitive dissociation in adolescent patients with NSSI and helped them directly experience the world around them. Thus, their behavior flexibility is improved, aligning with their own values. Apolinário-Hagen Jennifer et al²⁵ considered that ACT effectively improves the psychological flexibility of patients with anxiety and depression. This study also suggested that the EG had significantly lower ASLEC scores than the CG at T1 and T2, indicating that ACT can reduce the frequency and intensity of stressful life events in adolescents, thereby improving their mental health.

Adolescent patients with NSSI, due to cognitive biases, are unable to accept negative events or are easily guided by the external environment. They are prone to releasing their negative emotions through extreme behavior.²⁶ Based on the functional contextualism and the relational framework theory, ACT reduces experiential avoidance and improves individual psychological flexibility through flexible and diverse treatment techniques. As an important branch of cognitive behavioral therapy, ACT does not eliminate or change individuals' negative thoughts or emotions but rather encourages individuals to accept the negative thoughts or emotions, and guides them to establish the correct values.²⁷

This study also has certain limitations. This work was a single-center study with small study scope and sample size. Our study also had too many subjective observation indicators, so the research data may be biased. Accordingly, future studies should add objective observation indicators and implement multicenter and large-sample exploration to provide a more accurate reference for the clinical treatment of NSSI.

In summary, ACT can regulate the cognitive emotions of adolescent patients with NSSI, reduce their self-injury behavior, improve their psychological flexibility, reduce the frequency and intensity of stressful life events, and stabilize their psychological state, thereby improving the clinical treatment efficiency of NSSI. These effects can have extremely important clinical significance and social value for the treatment of adolescent patients with NSSI.

Data Availability Statement: Data to support the findings of this study are available on reasonable request from the corresponding author.

Ethics Committee Approval: This study was approved by the Ethics Committee of Hangzhou Seventh People's Hospital (Approval No: 2023004).

Informed Consent: As a retrospective study, it is not necessary to obtain informed consent of patients.

Peer-review: Externally peer-reviewed.

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