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Clinical Effects of Cognitive Behavioral Therapy Combined with Mindfulness Training on Emotional Regulation and Sleep Quality in Adolescents with Depressive Disorders

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Abstract: *Objective:* This study aimed to investigate the intervention effects of cognitive behavioral therapy (CBT) combined with mindfulness training on emotional regulation ability and sleep quality in adolescents with depressive disorders, providing evidence for optimizing non-pharmacological intervention strategies for adolescent depression in clinical settings. *Methods:* A total of 200 adolescent patients with depressive disorders admitted to the psychiatric outpatient and inpatient departments of our hospital from February 2025 to February 2026 were selected and randomly divided into a control group (100 cases) and an observation group (100 cases). The control group received conventional antidepressant medication plus routine psychological care, while the observation group received CBT combined with mindfulness training in addition to the control group's treatment. Both groups underwent an 8-week intervention period. Emotional state, emotional regulation ability, and sleep quality were assessed before and after the intervention, and adverse reactions were recorded. *Results:* After 8 weeks of intervention, compared with the control group, the observation group showed significantly lower scores on the Self-Rating Depression Scale (SDS), Self-Rating Anxiety Scale (SAS), Pittsburgh Sleep Quality Index (PSQI), and all dimensions and total scores of the Treatment Emergent Symptom Scale (TESS) (all $P < 0.001$). Scores on all dimensions of emotional regulation ability were significantly higher in the observation group (all $P < 0.001$). *Conclusion:* CBT combined with mindfulness training significantly improves depressive and anxious moods, enhances emotional regulation ability, and optimizes sleep quality in adolescents with depressive disorders, with good safety and clinical applicability.

Keywords: Cognitive behavioral therapy; Mindfulness training; Adolescent depressive disorders; Emotional regulation; Sleep quality

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1. Introduction

Adolescence is a critical period of rapid physical and psychological development and a high-risk phase for depressive disorders [1]. Epidemiological data indicate a rising prevalence of depressive disorders among Chinese adolescents,

with detection rates reaching 15%–20% among those aged 12–18 years old, severely impacting academic performance, social functioning, and physical and mental health, while increasing the risk of self-harm and suicide [2]. Currently, pharmacological treatment remains the primary approach for adolescent depressive disorders in clinical settings; however, monotherapy faces challenges such as slow onset, high recurrence rates, and poor adherence in some patients, with long-term medication use potentially affecting neurological development in adolescents. Cognitive behavioral therapy (CBT) is a widely used psychological intervention that improves depressive-related negative emotions by correcting distorted cognitions and reshaping adaptive behavioral patterns [3]. Mindfulness training, centered on "present-moment awareness and non-judgmental acceptance," helps individuals alleviate emotional distress and enhance psychological resilience. Combining these two approaches enables multidimensional intervention in depressive disorders through cognition, behavior, and emotional awareness. This study selected 200 adolescent patients with depressive disorders to explore the intervention effects of CBT combined with mindfulness training, with results reported as follows.

2. Materials and Methods

2.1. General Information

This study enrolled 200 adolescent patients with depressive disorders admitted to the psychiatric outpatient and inpatient departments of our hospital from February 2025 to February 2026. Inclusion criteria were as follows: (1) meeting the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria for depressive disorders; (2) aged 12–18 years old; (3) SDS standard score ≥ 53; (4) informed consent from patients and their families; and (5) absence of severe physical diseases or other psychiatric disorders such as schizophrenia. Exclusion criteria included: (1) severe liver or kidney dysfunction or cardiovascular/cerebrovascular diseases; (2) receipt of systematic psychological intervention within the past 3 months; (3) documented history of drug allergies; and (4) intellectual or communication disabilities precluding cooperation with intervention and assessment.

Patients were randomly assigned to a control group and an observation group using a random number table method, with 100 cases in each group. In the control group, there were 42 males and 58 females, aged 12–17 years old (mean: 14.62 ± 1.35 years old), with a disease duration of 3–18 months (mean: 8.25 ± 2.16 months). In the observation group, there were 45 males and 55 females, aged 13–18 years old (mean: 14.78 ± 1.29 years old), with a disease duration of 4–19 months (mean: 8.41 ± 2.08 months). No statistically significant differences in general characteristics were observed between the two groups ($P > 0.05$), indicating comparability.

2.2. Intervention methods

The control group received conventional antidepressant medication combined with routine psychological care: (1) Pharmacotherapy: Sertraline was administered based on the patient's age, weight, and condition (initial dose: 25 mg/day, gradually adjusted to 50–100 mg/day), taken orally once daily. Liver and kidney function and blood routine tests were monitored regularly during treatment, with medication regimens adjusted as needed. (2) Routine psychological care: Weekly 30-minute one-on-one psychological counseling sessions were conducted, covering disease education, medication guidance, emotional support, and family support to enhance treatment adherence.

In addition to the control group's interventions, the observation group received CBT combined with mindfulness training. Both groups underwent an 8-week intervention period, with weekly 30-minute sessions led by two professional physicians with over 5 years of clinical psychological intervention experience.

2.2.1. CBT intervention steps

(1) Cognitive restructuring phase (Weeks 1–3): Patients were guided to identify negative cognitions during depressive episodes, such as self-denial and loss of confidence in the future. Cognitive biases, including absolutist thinking, catastrophizing, and overgeneralization, were addressed through heuristic questioning and case comparisons to foster

rational and objective thinking.

(2) Behavioral activation phase (Weeks 4–6): Individualized behavioral rehabilitation plans were developed based on each patient's circumstances, encouraging participation in mild social activities and regular exercise (e.g., walking, jogging) to break the cycle of "low mood → social withdrawal → worsening depression." Patients were instructed to record daily behavioral patterns and emotional changes to reinforce positive behaviors.

(3) Consolidation and relapse prevention phase (Weeks 7–8): The entire intervention process was reviewed, and techniques for managing negative emotions were summarized. Patients were guided to apply cognitive restructuring methods flexibly in daily life to reduce the risk of depressive symptom recurrence.

2.2.2. Mindfulness training steps

(1) Mindful breathing: Patients assumed a comfortable seated position and focused on the physical sensations of nasal breathing, gently redirecting their attention back to breathing if their minds wandered. Each session lasted 15 minutes [4].

(2) Body scan: Patients systematically scanned their bodies from toes to head, observing physical sensations with an accepting and non-judgmental attitude toward tension or discomfort. Each session lasted 20 minutes.

(3) Present-moment awareness: Patients were guided to observe their immediate emotions and thoughts without resistance, adopting an observer's perspective to rationally view emotional fluctuations. Each session lasted 25 minutes. Professional guided audio was provided for all mindfulness exercises, and patients were instructed to practice independently at home for 20 minutes daily to reinforce intervention effects.

2.3. Observation Indicators

(1) Emotional state assessment: The SDS and SAS were used to evaluate emotional states before and after the 8-week intervention. Each scale consists of 20 items rated on a 4-point scale. An SDS standard score ≥ 53 indicates depressive symptoms, while an SAS standard score ≥ 50 indicates anxiety symptoms. Higher scores reflect more severe emotional disturbances.

(2) Emotional regulation ability assessment: The Emotion Regulation Scale (ERS), comprising 10 items across two dimensions (cognitive reappraisal and expressive suppression), was used with a 5-point rating scale. Higher total scores indicate stronger emotional regulation ability. Cognitive reappraisal, an adaptive strategy, correlates positively with emotional regulation ability, whereas expressive suppression, a maladaptive strategy, correlates negatively.

(3) Sleep quality assessment: The Pittsburgh Sleep Quality Index (PSQI), which evaluates seven dimensions (sleep quality, sleep latency, total sleep time, sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction) with a total score ranging from 0 to 21, was used. A PSQI score > 7 indicates poor sleep quality, with higher scores reflecting greater deterioration.

(4) Adverse reactions: The Treatment Emergent Symptom Scale (TESS), covering 37 items across multiple dimensions (e.g., somatic symptoms, behavioral abnormalities, laboratory abnormalities), was used to assess adverse reactions during the intervention. Each item was rated on a 0–4 scale (0: absent; 1: mild; 2: moderate; 3: severe; 4: life-threatening). Higher total scores indicate greater adverse reaction burden.

2.4. Statistical Methods

Data were analyzed using SPSS 27.0. Continuous variables are presented as means ± standard deviations (SD), with between-group comparisons conducted using t-tests. A P-value < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of Emotional State Scores Before and After Intervention

Compared with the control group, the observation group had significantly lower SDS and SAS scores (both $P < 0.001$)

(Table 1).

Table 1. Comparison of SDS and SAS scores before and after intervention between the two groups

Group	SDS Score		SAS Score	
	Before Intervention	After 8 Weeks of Intervention	Before Intervention	After 8 Weeks of Intervention
Control Group (n = 100)	62.34 ± 5.27	51.26 ± 4.82	56.78 ± 4.95	47.35 ± 4.21
Observation Group (n = 100)	62.51 ± 5.19	42.18 ± 4.36	56.92 ± 4.88	39.67 ± 3.95
t	0.216	13.970	0.201	13.319
P	0.829	< 0.001	0.841	< 0.001

3.2. Comparison of emotional regulation ability scores before and after intervention between the two groups

Compared with the control group, the observation group demonstrated significantly higher scores in both the cognitive reappraisal dimension and the expressive suppression dimension (both $P < 0.001$), as shown in **Table 2**.

Table 2. Comparison of ERS scores before and after intervention between the two groups

Group	Cognitive Reappraisal		Expressive Suppression	
	Pre-intervention	After 8 weeks of intervention	Pre-intervention	After 8 weeks of intervention
Control Group (n = 100)	22.45 ± 3.16	28.67 ± 3.52	18.32 ± 2.85	22.54 ± 3.01
Observation Group (n = 100)	22.58 ± 3.09	35.79 ± 3.68	18.41 ± 2.79	27.86 ± 3.12
t	0.272	14.001	0.228	12.268
P	0.786	< 0.001	0.820	< 0.001

3.3. Comparison of sleep quality scores before and after intervention between the two groups

Compared with the control group, the observation group had a lower PSQI score ($P < 0.001$), as shown in **Table 3**.

Table 3. Comparison of PSQI scores before and after intervention between the two groups

Group	Before Intervention	After 8 Weeks of Intervention
Control Group (n = 100)	13.56 ± 2.47	9.87 ± 1.68
Observation Group (n = 100)	13.72 ± 2.51	6.24 ± 1.35
t	0.454	16.883
P	0.650	< 0.001

3.4. Comparison of the incidence of adverse reactions between the two groups

Compared with the control group, the observation group demonstrated significantly lower scores across all dimensions and the total score of the TESS scale (all $P < 0.001$). See **Table 4**.

Table 4. Comparison of TESS scale scores between the two groups during the intervention period

Group	Behavioral Symptoms	Neurological Symptoms	Autonomic Nervous System Symptoms	Gastrointestinal Symptoms	Skin Symptoms	Laboratory Abnormalities	Total Score
Control Group (n = 100)	1.23 ± 0.35	1.35 ± 0.42	1.18 ± 0.38	1.05 ± 0.32	0.21 ± 0.15	0.18 ± 0.12	5.20 ± 1.26
Observation Group (n = 100)	0.56 ±0.22	0.62 ± 0.25	0.48 ± 0.19	0.42 ± 0.18	0.09 ± 0.08	0.07 ± 0.06	2.24 ± 0.78
t	15.907	14.873	16.736	17.071	7.346	8.613	20.013
P	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

4. Discussion

The pathogenic mechanism of adolescent depression is characterized by multivariate complexity. Clinical research and practical diagnosis and treatment both indicate that the onset and progression of this disease are closely related to three major factors: cognitive thinking biases, emotional regulation disorders, and sleep rhythm imbalances. These three factors do not act independently but interact and influence each other, forming a vicious cycle that is difficult to alleviate spontaneously. Adolescents are in a special developmental stage of cognitive growth and emotional and mental maturation, where negative cognitive beliefs can easily trigger adverse psychological experiences such as depression and anxiety. When an individual has deficiencies in emotional regulation ability, these negative emotions are difficult to effectively channel and release, subsequently disrupting normal sleep patterns and causing various sleep problems such as difficulty falling asleep, light sleep, and frequent nightmares [5]. At the same time, long-term poor sleep quality further increases cognitive load on the brain, resulting in cognitive impairment, a more pronounced tendency towards negative thinking, and a continuous decline in emotional state, ultimately leading to the aggravation of depressive clinical manifestations and the formation of an intractable vicious cycle [6]. Therefore, the key to clinical intervention in adolescent depressive disorders lies in breaking the vicious cycle among cognition, emotion, and sleep, and implementing comprehensive measures from multiple dimensions, such as cognitive correction, emotional regulation, and sleep intervention, to comprehensively improve the physical and mental health of patients.

The results of this study show that after 8 weeks of intervention, the scores of the Self-Rating Depression Scale (SDS) and Self-Rating Anxiety Scale (SAS) in the observation group were significantly lower than those in the control group, suggesting that Cognitive Behavioral Therapy (CBT) combined with mindfulness training can more effectively alleviate depression and anxiety in adolescent patients with depressive disorders. CBT helps patients establish rational cognition and reduce the impact of negative thinking on emotions by identifying and correcting cognitive distortions such as absolutization and catastrophization [7]; mindfulness training guides patients to observe their emotions with an accepting and non-judgmental attitude, avoiding emotional confrontation and reducing the intensity of emotional responses [8]. The synergistic effect of the two improves negative emotions from the aspects of cognitive adjustment and emotional awareness, showing better results than single-drug therapy combined with routine care.

Emotional regulation ability is a core competence for adolescents to resist psychological stress and maintain physical and mental health. Depressed individuals often exhibit psychological characteristics such as weakened cognitive reappraisal ability and deliberate suppression of emotional expression [9]. This study shows that after intervention, the score of the Cognitive Reappraisal Scale in the observation group was significantly better than that in the control group, confirming that comprehensive intervention can effectively improve patients' cognitive reappraisal level. This effect stems from the cognitive correction and behavioral activation of CBT, combined with the emotional perception effect of mindfulness training, helping patients master emotional regulation methods and improve emotional tolerance.

The synchronous increase in the score of the expression suppression dimension in the observation group suggests that intervention may exacerbate the tendency to suppress emotions and induce psychological repression. Some patients misinterpret the non-judgmental acceptance concept of mindfulness and deliberately suppress their emotional expression. Clinical intervention should pay attention to this issue, provide special guidance on reasonable emotional expression, correct misconceptions, and avoid psychological problems caused by excessive emotional suppression.

Sleep abnormalities are very common comorbid symptoms in adolescent patients with depression and are also a key factor restricting the recovery process of the disease [10]. The data from this study show that the overall score and scores of each dimension of the Pittsburgh Sleep Quality Index (PSQI) in the observation group were significantly lower than those in the control group, confirming that the combined intervention program can effectively improve patients' sleep status. Negative emotions such as depression and anxiety are the main inducements for sleep dysfunction. CBT combined with mindfulness training can effectively channel adverse emotions. Among them, the relaxation intervention method of mindfulness training can regulate the body's autonomic nervous system state, reduce sympathetic nervous system excitement, help patients relieve pre-sleep anxiety, reduce the time taken to fall asleep, and improve overall sleep stability; and after sleep status improves, it can also effectively relieve brain fatigue and optimize cognitive ability, ultimately forming a virtuous cycle of physical and mental recovery.

Throughout the clinical intervention process, close attention should be paid to the monitoring and control of adverse events. The adolescent group is particularly special, as individuals in this age group have not yet fully developed physically and mentally and have relatively weak drug tolerance. Once drug-related adverse reactions occur, they will not only reduce patients' treatment compliance but also pose potential risks to clinical diagnosis and treatment safety. This study used the Treatment Emergent Symptom Scale (TESS) to conduct standardized evaluations of adverse reactions in the two groups of subjects. The results show that the scores of each dimension and the overall total score of the scale in the observation group were significantly lower than those in the control group, and there was also a significant advantage in the probability of adverse reactions. This confirms that the intervention model combining CBT with mindfulness training can effectively avoid the occurrence of adverse events and improve the safety guarantee of clinical diagnosis and treatment. Mindfulness training can effectively relieve physical discomfort symptoms and improve the body's tolerance state, which may also be an important reason for the significantly lower incidence of adverse reactions in the observation group. In this study, the adverse reactions that occurred in the two groups of subjects were all of mild to moderate severity, and the symptoms were successfully relieved after clinical symptomatic intervention. No severe adverse events occurred throughout the process, fully confirming that CBT combined with mindfulness training has reliable clinical application safety.

This study has certain limitations: the study sample was only from a single hospital, so the sample representativeness is limited; the intervention period was 8 weeks, and no long-term follow-up was conducted, making it impossible to evaluate the long-term impact of the combined intervention on depression recurrence; and the differences in intervention among adolescents of different ages and genders were not explored in depth. In the future, the sample size can be expanded, multi-center studies can be carried out, and the follow-up period can be extended to further optimize the intervention program.

5. Conclusion

In conclusion, the application of CBT combined with mindfulness training in adolescent patients with depressive disorders can significantly improve depression and anxiety, enhance emotional regulation ability, optimize sleep quality, and has a low incidence of adverse reactions and good safety. It is an efficient and feasible non-drug combined intervention program worthy of clinical promotion and application.

Disclosure statement

The author declares no conflict of interest.

References

[1] Zeng ZW, Meng ML, 2025, Analysis of the Occurrence of Suicidal Ideation and Its Influencing Factors in Adolescent Patients with Depressive Disorders. Psychological Monthly, 20(16): 77–79.

[2] Mao YQ, Chen FZ, Wang YB, 2025, Research Progress on the Core Symptoms of Adolescent Depression Based on the Symptom Network Theory. Journal of Nursing Science, 40(15): 124–129.

[3] Jiang Q, Cao YQ, Miao XH, 2025, Observation on the Efficacy of Transcranial Magnetic Stimulation Combined with Cognitive Behavioral Therapy in Adolescent Patients with Mild Depression. Modern Instruments and Medical Care, 31(6): 36–40.

[4] Xia Y, Xing LH, Liu YY, 2025, Analysis of the Impact of Mindfulness-Based Stress Reduction Combined with Internet-Based Cognitive Behavioral Therapy on Psychological Improvement in Postpartum Depression Patients. Psychological Monthly, 20(5): 159–161.

[5] Li YC, 2025, Research on the Impact of Non-Drug Interventions on Sleep Disorders in Adolescents. Youth Sports, (9): 16–19.

[6] Yan FF, Sun LY, Li R, 2025, Research on the Effect of Rational Emotive Therapy on Depression Patients with Sleep Disorders. Psychological Monthly, 20(2): 149–151+166.

[7] Lan T, Shen P, Tong D, et al., 2024, Observation on the Clinical Efficacy of Cognitive Behavioral Therapy in the Treatment of Mental and Psychological Trauma After Injury and Illness. Psychological Monthly, 19(1): 152–154.

[8] Zhang GM, 2025, Exploration of the Effect of Mindfulness Training on Improving Emotional Stability in Middle School Students. Times Youth, (41): 29–31.

[9] Li YQ, Yuan JJ, 2025, Intervention and Mechanism of Action of Automatic Emotional Regulation on Depressive Symptoms. Psychological Science, 48(6): 1516–1526.

[10] Wang YQ, Zhan DL, 2025, Clinical Application Effect of Sertraline Combined with Corrective Training and Psychological Intervention in Adolescent Patients with Scoliosis Complicated by Depression. International Journal of Psychiatry, 52(6): 1922–1926.