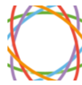
KMANPUB  Health Nexus Vol. 4 No. 2 (2026): 1-9

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The Effectiveness of Schema-Reconstruction-Based Cognitive Behavioral Therapy on Rumination in Patients With Depression: A Quasi-Experimental Study

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ABSTRACT

Depression is frequently maintained by repetitive negative thinking, particularly rumination, and by deeper maladaptive cognitive structures that shape how individuals interpret themselves, their emotions, and life events. This quasi-experimental study examined the effectiveness of schema-reconstruction-based cognitive behavioral therapy (CBT) in reducing depressive symptoms and rumination components among patients with depression. Thirty patients with depression who attended treatment clinics in Isfahan, Iran, in 2025 were selected from eligible volunteers and allocated to an experimental group ($n = 15$) and a control group ($n = 15$). Participants completed the Beck Depression Inventory and the Ruminative Response Scale before and after the intervention. The experimental group received eight 45-minute group sessions of schema-reconstruction-based CBT, while the control group received no psychological intervention during the active study period. The intervention focused on psychoeducation, identification of automatic thoughts, recognition of early maladaptive schemas, links between schemas and developmental experiences, cognitive restructuring, emotional and cognitive exposure to schemas, behavioral practice, and relapse prevention. Data were analyzed using one-way analysis of covariance in SPSS version 22. Compared with the control group, the experimental group showed lower posttest scores for depression, distraction, reflection, and brooding/absorption in thought. Group effects were significant for depression, $F = 52.74$, $p <= .01$; distraction, $F = 10.73$, $p <= .01$; reflection, $F = 15.75$, $p <= .01$; and brooding/absorption in thought, $F = 16.89$, $p <= .01$. Schema-reconstruction-based CBT was associated with meaningful reductions in depressive symptoms and all measured components of rumination. The findings support the value of targeting deeper cognitive schemas when treating depression characterized by repetitive negative thinking. Larger trials with follow-up assessments are recommended.

Keywords: *cognitive behavioral therapy; schema reconstruction; rumination; depression; Beck Depression Inventory; Ruminative Response Scale*

1. Introduction

Depression is one of the most disabling mental health conditions and is associated with persistent sadness, loss of interest, hopelessness, impaired concentration, sleep and appetite disturbance, reduced energy, and diminished social and occupational functioning. Beyond symptom

severity, depression is clinically important because it often follows a recurrent or chronic course and can reduce a person's ability to work, maintain relationships, and engage in meaningful daily activities. Cognitive models of depression have long emphasized that the disorder is not maintained only by negative life events or mood states; it is also sustained by the way individuals interpret those events, evaluate themselves, and repeatedly process emotional distress. Beck's cognitive theory proposed that negative views of the self, world, and future are central to depressive experience, and later cognitive models have extended this framework to include deeper schemas, attentional biases, and repetitive negative thinking (1, 2). Rumination is one of the most studied cognitive processes in depression. It refers to repetitive, self-focused thinking about the causes, meanings, symptoms, and consequences of negative mood. The response styles theory proposed that individuals who respond to dysphoric mood by repetitively analyzing their distress are more likely to experience longer and more severe depressive episodes (3). Later reviews concluded that rumination can amplify negative thinking, impair problem-solving, interfere with instrumental behavior, and weaken social support (4). Rumination is therefore not merely a symptom that accompanies depression; it is a maintaining mechanism that can keep individuals mentally locked into negative content even when they are trying to understand or solve their problems. Rumination is commonly assessed through the Ruminative Response Scale, which has been used widely in research on depression and repetitive negative thinking. Psychometric research has indicated that rumination is not a single homogeneous construct. Treynor and colleagues (2003) distinguished more maladaptive brooding from reflective pondering, showing that different forms of repetitive thought can have different relationships with depressive symptoms (5). More broadly, Watkins (2008) argued that repetitive thinking may be constructive or unconstructive depending on its processing mode, level of abstraction, and relationship to problem solving (6). This distinction is clinically useful: helping patients simply think less is rarely sufficient; therapy must help patients shift from abstract, self-critical, and repetitive processing toward more concrete, flexible, and problem-solving forms of thinking.

Cognitive behavioral therapy is among the most widely evaluated psychological treatments for depression. It is structured, collaborative, and time-limited, and it aims to help clients identify and modify maladaptive thoughts and behaviors that maintain distress. Large reviews and meta-analyses support CBT as an effective intervention for adult depression and other emotional disorders (7, 8). CBT is particularly relevant to rumination because many ruminative thoughts contain distorted appraisals, untested assumptions, and rigid predictions about the self and future. Rumination-focused adaptations of CBT have also shown promise for residual and recurrent depression, suggesting that explicitly targeting the habit of repetitive negative thinking can improve depressive outcomes (9, 10).

However, standard CBT may be less effective for some patients when ruminative thinking is organized around deeper and more enduring schemas. Schemas are broad cognitive-emotional structures that influence how individuals interpret experience. Early maladaptive schemas are believed to develop through adverse or unmet emotional needs and may become activated in later life, especially during interpersonal stress or failure. Once activated, schemas can generate automatic thoughts, intense emotions, avoidance behaviors, and repetitive self-focused analysis. A systematic review and meta-analysis found a consistent relationship between early maladaptive schemas and adult depression (11). From this perspective, rumination may be understood as a surface-level expression of deeper schema activation: a person repeatedly thinks about failure, shame, abandonment, or worthlessness because these themes are embedded in long-standing cognitive structures. Schema-reconstruction-based CBT integrates the structured techniques of CBT with a deeper focus on identifying and modifying maladaptive schemas. Rather than only challenging an isolated automatic thought, the therapist helps clients understand how recurring thoughts are connected to stable beliefs, developmental learning, and emotional patterns. This approach may be especially useful for depressed patients who report persistent rumination because repeated negative thinking often returns even after a specific thought has been disputed. Schema reconstruction encourages clients to identify the underlying rule or belief that makes the rumination feel compelling, examine evidence for and against that belief, generate more balanced interpretations, and practice new behaviors that disconfirm

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the old schema. In this way, cognitive, emotional, and behavioral change are linked.

The present study evaluated an eight-session group intervention described as schema-reconstruction-based cognitive behavioral therapy for patients with depression. The study focused on depressive symptoms and three rumination-related components: distraction, reflection, and brooding/absorption in thought, as reported in the source data. Although distraction is often conceptualized differently across response-style frameworks, the present report follows the scoring and interpretive direction used in the original dataset, where lower scores indicated improvement. The central hypothesis was that participants who received the intervention would show lower posttest scores on depression and rumination components than participants in the control group after controlling for pretest scores. The study contributes to clinical practice by testing a brief, structured, group-based intervention that targets both cognitive symptoms and the deeper schema structures that may maintain repetitive negative thinking.

2. Methods and Materials

This applied study used a quasi-experimental pretest-posttest design with an experimental group and a control group. The source protocol also referred to a follow-up design; however, the dataset available for manuscript preparation contained pretest and posttest results only. Therefore, the present report is limited to immediate post-intervention outcomes and does not make claims about the durability of treatment effects after the posttest period. The independent variable was participation in schema-reconstruction-based CBT, and the dependent variables were depressive symptoms and rumination components. The statistical population consisted of patients with depression who attended treatment clinics in Isfahan, Iran, in 2025. Initially, approximately 80 individuals with depressive symptoms were screened. Participants were eligible if they obtained the required score on the depression questionnaire, had moderate to severe depressive symptoms according to the study screening procedure, reported rumination, were between 25 and 60 years old, had at least a diploma-level education, had not received psychological treatment before entering the study, had not used psychiatric medication for at least six months before the study, and provided written informed consent. Exclusion criteria included irregular attendance in intervention sessions, failure to complete assigned homework, and unwillingness to continue participation. Thirty eligible participants were selected and assigned to two groups of 15 participants each. The experimental group received schema-reconstruction-based CBT, and the control group did not receive a psychological intervention during the active study period. Both groups completed the assessment measures at pretest and posttest. Because the sample was small and drawn from clinical attendees in one city, the findings should be interpreted as preliminary and context-specific rather than as definitive evidence for broad generalization. Depressive symptoms were measured using the Beck Depression Inventory. The original Beck Depression Inventory was developed by Beck and colleagues as a 21-item self-report measure for assessing the intensity of depressive symptoms (2). In the study protocol, each item was scored from 0 to 3, producing a total score from 0 to 63, with higher scores indicating more severe depressive symptoms. The protocol described common interpretive categories ranging from minimal symptoms to severe depression. The instrument has been widely used in clinical research and has extensive evidence for validity and reliability. Rumination was measured using the Ruminative Response Scale. The source protocol described the scale as a 22-item measure developed by Nolen-Hoeksema and Morrow, with items rated on a four-point scale from 1 (never) to 4 (often). Total scores range from 22 to 88, with higher scores indicating more frequent ruminative responses. The protocol also reported three components: distraction, reflection, and brooding/absorption in thought. The internal consistency of the scale has been reported as high in previous research, and the Persian validation evidence cited in the source study reported acceptable test-retest reliability.

As shown before Table 1, the intervention was organized into eight 45-minute group sessions. Each session introduced paper-and-pencil cognitive or schema-focused techniques, followed by homework assignments that were reviewed at the beginning of the next session.

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Table 1

Structure of the schema-reconstruction-based cognitive behavioral therapy intervention

Session	Description
Session 1: Familiarization, treatment frame, and basic concepts	Group members were introduced to the treatment goals, session structure, group rules, and their active role in therapy. Depression was explained from a cognitive-behavioral perspective, with attention to the relationship among thoughts, emotions, and behaviors. The concept of schema was introduced as a deep cognitive pattern, and examples of schema formation were provided. The session emphasized therapeutic alliance and treatment motivation. Homework included written monitoring of daily emotional situations and related thoughts.
Session 2: Identification of automatic thoughts and cognitive patterns	Homework was reviewed and difficulties were addressed. Automatic thoughts, their characteristics, and their role in emotional experience were explained. Participants learned to identify and record negative automatic thoughts in different situations. Paper-and-pencil exercises were used to separate situation, thought, emotion, and behavior. Homework involved regular recording of negative automatic thoughts in daily situations.
Session 3: Introduction to early maladaptive schemas	After homework review, early maladaptive schemas and their main features were introduced. Common schemas, including abandonment, defectiveness/shame, dependence, and unrelenting standards, were explained. Participants used written forms to identify their dominant schemas. Homework included completing schema-identification forms and recording situations in which these schemas became activated.
Session 4: Relationship between schemas and past experiences	After reviewing homework, the developmental origins of schemas were discussed. The roles of childhood experiences, early relationships, and parenting styles in schema formation were explained. Written exercises helped participants connect identified schemas with earlier life experiences. The main goal was to increase insight into the origins of schemas. Homework involved writing memories related to the development of each schema.
Session 5: Cognitive restructuring of schemas	Schema-level cognitive restructuring techniques were taught. Maladaptive core beliefs were examined, and evidence supporting or contradicting them was analyzed using paper-and-pencil exercises. Participants learned to formulate more logical and adaptive alternative beliefs for their schemas. Homework included practicing cognitive restructuring and writing alternative beliefs.
Session 6: Cognitive and emotional exposure to schemas	The concept of cognitive and emotional exposure to schemas was introduced. Guided imagery and written exercises were used to face schema-triggering situations. The session aimed to reduce cognitive avoidance and increase emotional tolerance. Homework involved written exposure to challenging situations related to activated schemas.
Session 7: Stabilizing adaptive beliefs and behavioral exercises	New adaptive beliefs were reviewed and strengthened. The role of new behaviors in consolidating cognitive change was explained. Participants used paper-and-pencil exercises to design alternative behaviors consistent with their new beliefs. Homework included implementing new behaviors and recording their cognitive and emotional consequences.
Session 8: Summary, relapse prevention, and termination	The entire treatment process was reviewed and summarized. Cognitive and emotional changes were discussed, and maintenance of therapeutic gains was emphasized. Relapse-prevention strategies, identification of high-risk situations, and independent use of learned techniques were taught. Participants provided feedback, and the group treatment was concluded.

Note. CBT = cognitive behavioral therapy.

The intervention was delivered in group format. Techniques were presented step by step, and homework was used to support transfer of session learning to daily life. In the first phase, participants learned to monitor mood, identify negative automatic thoughts, and recognize the relationship among events, interpretations, emotions, and behaviors. In the middle phase, participants identified early maladaptive schemas and examined the developmental experiences that may have contributed to them. In the later phase, participants practiced schema-level cognitive restructuring, emotional exposure, and new behaviors designed to test more adaptive beliefs. The final session focused on consolidation and relapse prevention. Data were analyzed using SPSS version 22. Descriptive statistics included means and standard deviations for each outcome variable in both groups at pretest and posttest. For inferential analysis, one-way analysis of covariance was used separately for depression and each rumination component. Pretest scores were treated as covariates to adjust posttest comparisons for baseline differences. Statistical significance was evaluated at the conventional .05 level, although the original results reported significant effects at $p <= .01$ for all study hypotheses. Inferential tables were formatted using sums of squares, mean squares, F values, p values, and partial eta-squared values.

3. Findings and Results

The study included 30 patients with depression, with 15 participants in the experimental group and 15 participants in the control group. The results section is based only on the descriptive and covariance-analysis values provided in the source dataset. No follow-up scores were available; therefore, the findings describe immediate pretest-to-posttest change. The descriptive pattern is presented before Table 2. At pretest, the two groups had very similar depression scores. The experimental group mean was 15.58 (SD = 6.74), and the control group mean was 15.51 (SD = 5.96). At posttest, the experimental group mean decreased to

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13.54 (SD = 6.51), whereas the control group mean remained nearly unchanged at 15.41 (SD = 5.71). For the rumination components, the experimental group also showed reductions from pretest to posttest in distraction, reflection, and brooding/absorption in thought. The control group showed minimal change, with slight increases in distraction and reflection and a very small decrease in brooding/absorption in thought.

Table 2

Descriptive statistics for depression and rumination components by group and time

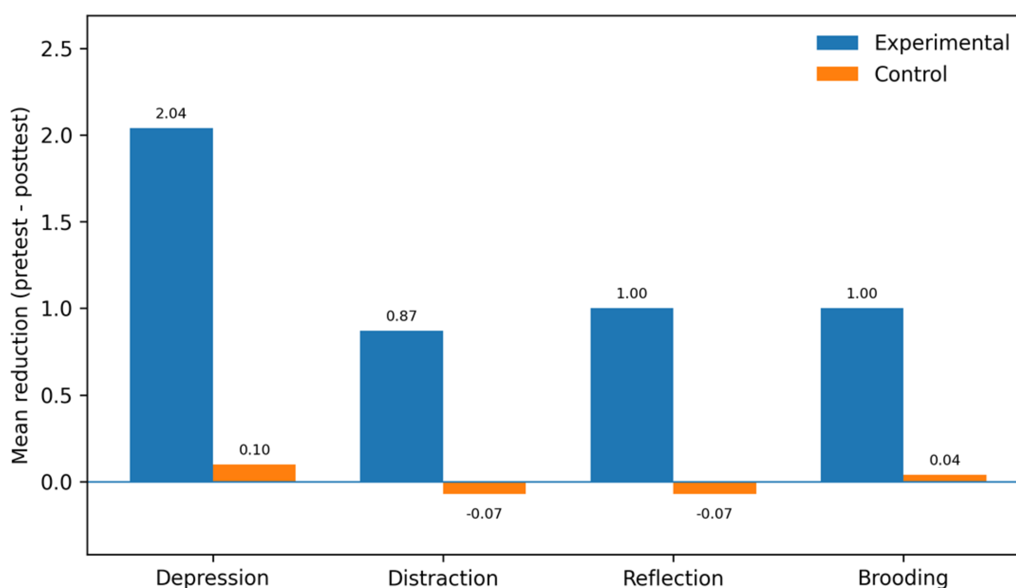
Variable	Group	n	Pretest M	Pretest SD	Posttest M	Posttest SD
Depression	Experimental	15	15.58	6.74	13.54	6.51
Depression	Control	15	15.51	5.96	15.41	5.71
Distraction	Experimental	15	4.51	2.52	3.64	2.27
Distraction	Control	15	4.24	2.27	4.31	2.31
Reflection	Experimental	15	6.94	2.71	5.94	2.71
Reflection	Control	15	7.44	2.69	7.51	3.24
Brooding/absorption in thought	Experimental	15	5.84	2.36	4.84	2.36
Brooding/absorption in thought	Control	15	5.98	1.69	5.94	1.41

Note. M = mean; SD = standard deviation. Lower scores indicate lower depression or lower rumination-related symptoms according to the study interpretation.

The visual pattern of change is displayed before Figure 1. The figure presents reduction scores calculated as pretest minus posttest mean values. Positive values indicate symptom reduction, whereas negative values indicate a slight increase from pretest to posttest. The experimental group showed larger reductions than the control group across all outcomes, especially depression and the rumination components of reflection and brooding/absorption in thought.

Figure 1

Mean pretest-to-posttest reduction scores in the experimental and control groups.



Note. Reduction scores were computed as pretest mean minus posttest mean using the descriptive statistics available in the source results. Positive values indicate improvement.

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The ANCOVA results are summarized before Table 3. The statistical table was rechecked for internal consistency. The intervention effects reported in the source results were preserved, while p values and partial eta-squared values were recalculated from the reported F statistics and degrees of freedom. For depression, the group effect was statistically significant, F = 52.74, p < .001, partial eta squared = .66, indicating that the posttest depression score differed significantly between the experimental and control groups after accounting for pretest scores. This supports the first hypothesis that schema-reconstruction-based CBT reduced depressive symptoms in patients with depression. For the distraction component, the group effect was also significant, F = 10.73, p = .003, partial eta squared = .28. The experimental group showed a reduction from 4.51 to 3.64, whereas the control group changed from 4.24 to 4.31. This supports the second hypothesis that the intervention reduced the distraction component as scored and interpreted in the source study. For reflection, the group effect was significant, F = 15.75, p < .001, partial eta squared = .37. The experimental group decreased from 6.94 to 5.94, while the control group changed from 7.44 to 7.51. This supports the third hypothesis that the intervention reduced reflective rumination-related thinking. For brooding/absorption in thought, the group effect was significant, F = 16.89, p < .001, partial eta squared = .38. The experimental group decreased from 5.84 to 4.84, whereas the control group decreased only slightly from 5.98 to 5.94. This supports the fourth hypothesis that the intervention reduced brooding/absorption in thought.

Table 3

Data-checked ANCOVA results for depression and rumination components

Outcome	Source	SS	df	MS	F	p	Partial Eta²
Depression	Pretest	1.14	1	1.14	1.92	.177	.07
Depression	Group	31.42	1	31.42	52.74	< .001	.66
Depression	Error	16.09	27	0.596			
Distraction	Pretest	129.79	1	129.79	219.32	< .001	.89
Distraction	Group	6.35	1	6.35	10.73	.003	.28
Distraction	Error	15.98	27	0.592			
Reflection	Pretest	217.82	1	217.82	429.37	< .001	.94
Reflection	Group	7.99	1	7.99	15.75	< .001	.37
Reflection	Error	13.70	27	0.507			
Brooding	Pretest	88.49	1	88.49	169.27	< .001	.86
Brooding	Group	8.83	1	8.83	16.89	< .001	.38
Brooding	Error	14.12	27	0.523			

Note. SS = sum of squares; MS = mean square. Group F values were retained from the source results. The depression pretest SS, p values, and partial eta-squared values were corrected for internal statistical consistency using df = 1, 27. Power values were omitted because the original power column was not consistently compatible with the corrected table

4. Discussion

The present study examined the effectiveness of schema-reconstruction-based CBT for reducing depressive symptoms and rumination components among patients with depression. The results supported all four hypotheses. Compared with the control group, the experimental group showed lower posttest scores for depression, distraction, reflection, and brooding/absorption in thought after receiving eight 45-minute group sessions. Although the sample was small and the control group was passive, the consistency of the findings across all outcomes suggests that the intervention was associated with meaningful short-term improvement. The reduction in depression is consistent with cognitive theories that conceptualize depressive symptoms as partly maintained by maladaptive interpretations of the self, world, and future. CBT helps clients identify negative automatic thoughts and test their accuracy, but schema reconstruction extends this work to deeper beliefs that give repeated thoughts their emotional force. For example, a depressed patient may not only think, 'I failed today,' but may also hold a broader schema such as 'I am fundamentally defective' or 'I will always be rejected.' When therapy targets only the surface-level thought, new versions of the same

negative content may return. Schema-level work attempts to modify the deeper organizing structure, which may explain why the experimental group showed improvement in depressive symptoms.

The results for rumination are also theoretically coherent. Rumination is often maintained by the belief that repeated analysis will produce insight or control. However, when thinking remains abstract, repetitive, and self-critical, it can prolong negative mood and increase cognitive load. The intervention used in this study encouraged participants to write down thoughts, identify schemas, examine evidence, generate alternative beliefs, and test new behaviors. These procedures may reduce rumination by making negative thinking more concrete and less automatic. Rather than repeatedly asking why they feel depressed, participants may have learned to identify the schema being activated and respond with a structured cognitive and behavioral strategy. The decrease in reflection and brooding/absorption in thought is particularly important because these components represent the more repetitive and internally focused aspects of depressive rumination. Reflection may sometimes be adaptive when it leads to problem solving, but in depression it can become abstract and self-critical. Brooding is generally considered more maladaptive because it involves passive comparison of one's current state with an unachieved standard. Schema reconstruction may interrupt both processes by shifting attention from passive mental repetition to active evaluation and modification of underlying beliefs. This is consistent with the wider rumination-focused CBT literature, which suggests that reducing the abstract and habitual quality of rumination can improve depressive outcomes (9, 10).

The findings align with previous evidence showing that rumination is a major maintaining factor in depression. Nolen-Hoeksema's response styles theory proposed that ruminative responses intensify and prolong depressive mood. Later reviews and meta-analytic work supported rumination as a cognitive vulnerability factor and a treatment target. The present study adds to this literature by focusing on an intervention that combines cognitive-behavioral strategies with schema reconstruction. This combination is clinically meaningful because many depressed patients experience repetitive thoughts that are not isolated distortions but expressions of long-standing schemas related to failure, rejection, shame, dependency, or emotional deprivation. The intervention may also have improved patients' sense of agency. Depression and rumination often create a feeling of being trapped inside one's thoughts. The group sessions provided a structured sequence: observe a situation, identify the thought, locate the schema, examine its origin, test its validity, and practice a new response. This sequence can transform rumination from an uncontrolled internal loop into a workable clinical target. Homework assignments may have strengthened this effect by requiring patients to apply techniques between sessions and by giving them evidence that their thinking patterns could be changed through practice. The clinical implications are practical. Clinicians working with depressed patients who show high levels of rumination may benefit from assessing not only the frequency of repetitive negative thinking but also the schemas that organize its content. When rumination revolves around recurring themes such as worthlessness, abandonment, failure, or strict self-criticism, schema-level formulation may guide more precise intervention. Group-based delivery may also be useful in clinical settings because it can provide psychoeducation, normalization, and peer learning, although group format requires careful management to avoid excessive sharing of negative content without therapeutic processing. Despite these strengths, the study has limitations. First, the sample size was small, and participants were recruited from treatment clinics in Isfahan, which limits generalizability. Second, the control group did not receive an active comparison intervention, so the observed effects may partly reflect therapist attention, group support, expectancy, or structured activity. Third, the outcomes were measured with self-report scales, which may be influenced by response bias, mood at the time of testing, or social desirability. Fourth, although the protocol referred to a follow-up design, the available results included only pretest and posttest data, so the durability of treatment gains cannot be evaluated. Fifth, exact demographic characteristics and therapist-fidelity data were not available in the source results, limiting interpretation of implementation quality. Future studies should use larger randomized controlled designs, include active control conditions, and assess outcomes at follow-up points such as one, three, and six months after treatment. It would also be useful to examine whether reductions in specific schemas

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mediate reductions in rumination and depression. Future research should report treatment fidelity, therapist training, adherence to the intervention protocol, and participant attendance. Qualitative interviews could also clarify how patients experience schema reconstruction and which techniques they perceive as most helpful for interrupting rumination.

In summary, the results suggest that schema-reconstruction-based CBT is a promising intervention for depressed patients with ruminative thinking. By targeting both surface-level automatic thoughts and deeper maladaptive schemas, the intervention may reduce the cognitive structures that keep depressive rumination active. The findings are preliminary but clinically useful and justify further investigation with stronger methodology and longer-term follow-up.

5. Conclusion

Eight sessions of schema-reconstruction-based cognitive behavioral therapy were associated with significant reductions in depressive symptoms and rumination components among patients with depression. The intervention appeared to reduce not only overall depressive symptoms but also distraction, reflection, and brooding/absorption in thought as measured in the study. The findings support the clinical value of addressing early maladaptive schemas and repeated negative thinking together. Because the study used a small sample and immediate posttest assessment only, further randomized trials with active controls and follow-up data are needed before firm conclusions can be drawn about long-term effectiveness.

Authors' Contributions

Elahe Ghorbani contributed to conceptualization, study coordination, and manuscript drafting. Arezoo Zarei contributed to intervention planning, data collection, and literature review. Zeinab Panahian contributed to data organization, interpretation of rumination-related outcomes, and manuscript revision. Zohreh Nazemi contributed to clinical interpretation, methodology, and editing of the discussion. Mahdieh Abdollahi Vand Nodeh contributed to review of clinical content, final editing, and approval of the final manuscript. All authors reviewed and approved the final version for submission.

Declaration

Artificial intelligence tools were used only to support English-language editing, academic restructuring, and formatting of the manuscript. The study design, original data, statistical results, interpretation, references, and final scientific responsibility remain with the authors. No participant data were generated or altered by artificial intelligence.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study was conducted in accordance with ethical principles for psychological research with human participants. Participants were informed about the purpose and procedures of the study, the voluntary nature of participation, confidentiality of responses, and their right to withdraw without penalty. Written informed consent was obtained before data collection.

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