

# Comparison of the Effectiveness of Cognitive Behavioral Therapy and Schema Therapy on Catastrophizing in Young Adults with Depressive Symptoms

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## ABSTRACT

The present study aimed to compare the effectiveness of Cognitive Behavioral Therapy (CBT) and Schema Therapy (ST) on reducing catastrophizing in young adults with depressive symptoms. This applied study employed a quasi-experimental pretest–posttest design with a control group and a two-month follow-up period. The statistical population consisted of young adults diagnosed with depressive disorder who referred to counseling and psychological clinics in District 1 of Tehran between December 2024 and June 2025. From 224 eligible individuals, 45 participants meeting the inclusion criteria were selected using purposive sampling and randomly assigned to three groups: CBT (n = 15), ST (n = 15), and control (n = 15). Both intervention groups participated in eight structured group therapy sessions based on standardized treatment protocols, while the control group received no psychological intervention during the study period. Data were collected using validated self-report measures assessing depressive symptoms and catastrophizing. Statistical analysis was conducted using repeated measures analysis of variance (ANOVA) and Bonferroni post hoc tests in SPSS version 26, after verifying statistical assumptions. The results of repeated measures ANOVA indicated a significant main effect of time ( $p < 0.001$ ) and a significant time  $\times$  group interaction effect ( $p < 0.001$ ) on catastrophizing, while the main effect of group was not statistically significant ( $p > 0.05$ ). Bonferroni post hoc comparisons showed that both CBT and ST groups had significantly lower posttest catastrophizing scores compared to the control group ( $p < 0.001$ ). However, no statistically significant difference was observed between the CBT and ST groups at posttest ( $p > 0.05$ ). Pairwise comparisons across time demonstrated significant reductions in catastrophizing from pretest to posttest and from pretest to follow-up in both intervention groups ( $p < 0.001$ ), with maintenance of treatment effects at follow-up. Both Cognitive Behavioral Therapy and Schema Therapy were effective in significantly reducing catastrophizing in young adults with depressive symptoms, and their effects were sustained over time; however, no significant difference was found between the two interventions in terms of overall effectiveness.

**Keywords:** Cognitive Behavioral Therapy, Schema Therapy, Catastrophizing, Depressive Symptoms, Young Adults, Quasi-Experimental Study

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## Introduction

Major depressive symptoms in young adulthood represent a critical mental health concern due to their high prevalence, functional impairment, and long-term psychosocial consequences. Cognitive distortions play a central role in the onset, maintenance, and recurrence of depressive symptomatology, among which

catastrophizing has been identified as a particularly maladaptive appraisal pattern. Catastrophizing refers to a cognitive process characterized by exaggerated negative interpretations of events, magnification of potential threats, and persistent rumination about worst-case outcomes. Although the construct has been extensively examined in chronic pain populations, its cognitive mechanisms overlap substantially with depressive cognition, particularly in domains such as hopelessness, helplessness, and negative future-oriented thinking. Previous research has consistently demonstrated that maladaptive cognitive appraisals intensify emotional distress and amplify perceived suffering (1). In depressive states, catastrophizing not only intensifies negative affect but also reduces perceived coping capacity and undermines adaptive behavioral engagement.

Empirical findings from clinical populations highlight that catastrophizing is strongly associated with increased symptom severity and reduced psychological functioning. In chronic pain samples, catastrophizing has been linked with greater pain intensity, emotional dysregulation, and diminished quality of life (2). Similar patterns have been observed in elderly populations, where emotional schemas mediate the relationship between maladaptive cognition and pain perception (3). The cognitive-emotional interplay underlying catastrophizing suggests that individuals who interpret internal or external experiences in catastrophic terms are more vulnerable to mood disturbances and functional impairment. This relationship is further supported by integrative models demonstrating that mood and anxiety symptoms contribute to maladaptive cognitive patterns through mediating mechanisms such as experiential avoidance and self-compassion deficits (4). Therefore, targeting catastrophizing within depressive youth populations may represent a critical intervention focus.

Cognitive Behavioral Therapy (CBT) has long been recognized as one of the most empirically supported treatments for depressive disorders. CBT conceptualizes psychopathology as stemming from distorted cognitive appraisals and dysfunctional core beliefs that shape emotional and behavioral responses. Numerous randomized controlled trials have demonstrated that CBT effectively reduces catastrophizing and enhances self-efficacy across diverse clinical conditions. For example, preoperative CBT interventions have been shown to significantly reduce pain catastrophizing and improve postoperative outcomes (5). Similarly, CBT has demonstrated effectiveness in reducing catastrophizing and alexithymia among chronic pain patients (6). In women with breast cancer, cognitive therapy significantly enhanced pain self-efficacy while reducing catastrophizing cognitions (7). Web-based CBT interventions have also proven effective in increasing pain self-efficacy in rheumatoid arthritis patients (8). Recent systematic review protocols continue to emphasize the central role of CBT in improving pain and functional outcomes (9), and contemporary empirical studies confirm its beneficial effects on pain and quality of life (10). Moreover, large-scale randomized clinical trials comparing mindfulness-based approaches and CBT indicate that CBT remains a robust and effective modality in managing cognitive distortions associated with chronic conditions (11). Collectively, these findings provide strong evidence that CBT can effectively modify maladaptive cognitive appraisals such as catastrophizing.

Schema Therapy (ST), developed by Young and colleagues, extends traditional cognitive models by integrating cognitive, behavioral, experiential, and attachment-based techniques. It focuses on early maladaptive schemas that originate in childhood and are reinforced across the lifespan, shaping persistent cognitive-emotional patterns. Evidence suggests that early maladaptive schemas significantly mediate

symptom intensity and emotional distress. For instance, attachment styles have been shown to influence pain intensity through the mediation of early maladaptive schemas (12). Emotional schemas also contribute to mood and anxiety symptomatology, particularly when mediated by cognitive perfectionism dimensions (13). Schema-based interventions have demonstrated positive effects in clinical populations. Schema Therapy has been shown to improve pain acceptance, enhance pain self-efficacy, and reduce emotional dysregulation in surgical patients (14). Mindfulness-based schema therapy has also been found effective in reducing mental pain and experiential avoidance among cardiovascular patients (15). Comparative research has revealed that schema-based and emotion-focused interventions can significantly reduce catastrophizing and experiential avoidance in chronic pain populations (16, 17). These findings underscore the therapeutic relevance of addressing deeper cognitive-emotional structures rather than solely targeting surface-level automatic thoughts.

Comparative investigations between CBT and Schema Therapy have yielded important insights. In a study conducted among patients with chronic low back pain in Tehran, both CBT and Schema Therapy were effective in reducing pain catastrophizing and increasing pain self-efficacy (18). This suggests that while CBT primarily modifies dysfunctional thought patterns through structured cognitive restructuring, Schema Therapy may exert its effects by transforming underlying schemas and maladaptive coping modes. Given that depressive symptoms are often rooted in deeply entrenched beliefs about the self, world, and future, Schema Therapy may provide additional therapeutic benefits for individuals whose cognitive distortions are embedded within broader maladaptive schemas. However, direct comparative research examining these two interventions specifically in young adults with depressive symptoms remains limited.

Recent conceptual developments emphasize the dynamic nature of cognitive appraisal and emotional regulation processes. Changes in cognitive appraisal mechanisms have been shown to mediate treatment outcomes in mindfulness-based cognitive therapy trials (1). Moreover, contemporary models highlight the role of experiential avoidance and emotional regulation deficits in sustaining maladaptive cognitive patterns (4). Young adults, due to developmental transitions and identity formation processes, may be particularly vulnerable to maladaptive schema activation and catastrophic interpretations of stressors. Depression during this stage often coexists with heightened cognitive reactivity and sensitivity to perceived failure or rejection, further reinforcing catastrophic thinking patterns. Therefore, interventions that address both cognitive distortions and underlying schema-level vulnerabilities may be especially beneficial for this population.

Despite the substantial body of literature supporting both CBT and Schema Therapy in pain-related and chronic illness populations, there remains a need to examine their comparative effectiveness in reducing catastrophizing specifically among young adults with depressive symptoms. Most prior studies have focused on chronic pain conditions, surgical recovery, or medical populations (5, 7, 11). While the cognitive mechanisms are conceptually transferable, depressive catastrophizing may manifest differently due to its strong association with hopelessness and self-critical schemas. Moreover, previous comparative studies have primarily targeted pain populations (18), leaving a research gap in mood-related contexts.

Addressing this gap is particularly important given evidence that maladaptive emotional schemas and cognitive distortions interact synergistically to maintain psychological distress (12, 13). Furthermore, reductions in catastrophizing have been associated with improvements in broader psychosocial functioning

and quality of life (10). Thus, understanding which therapeutic approach yields more sustainable cognitive change can inform clinical decision-making and optimize treatment planning for young adults experiencing depressive symptoms.

In light of the theoretical foundations and empirical evidence presented, the present study aims to compare the effectiveness of Cognitive Behavioral Therapy and Schema Therapy on reducing catastrophizing in young adults with depressive symptoms.

## Methods and Materials

### *Study Design and Participants*

This applied research was conducted using a quasi-experimental design with a pretest–posttest control group structure and a two-month follow-up period. The research model consisted of three measurement phases: pretest (T1), posttest (T2), and follow-up (T3), with two experimental groups receiving therapeutic interventions and one control group receiving no psychological intervention during the study period. After the pretest assessment, participants were randomly assigned to one of three groups: the first experimental group receiving Cognitive Behavioral Therapy (CBT), the second experimental group receiving Schema Therapy (ST), and the control group. Both therapeutic interventions were implemented after random allocation, and outcome variables were assessed at posttest and again two months later to examine the stability of treatment effects over time.

The statistical population included all young adults diagnosed with depressive disorder who referred to counseling and psychological clinics in District 1 of Tehran between December 2024 and June 2025. During this period, 224 individuals sought specialized psychological services. Sampling was conducted using a non-random purposive method. Based on recommendations from similar quasi-experimental studies suggesting a minimum of 15 participants per group to ensure sufficient statistical power, 45 individuals who met the inclusion criteria were selected as the final sample. These participants were randomly allocated into three groups of 15 individuals each: 15 in the Cognitive Behavioral Therapy group, 15 in the Schema Therapy group, and 15 in the control group.

Inclusion criteria required participants to have at least a high school diploma, a confirmed diagnosis of depressive disorder by a psychiatrist and a licensed clinical psychologist, completion of a written informed consent form, age between 20 and 40 years, and no concurrent participation in individual counseling services during the intervention period. In addition, participants were required to score above 20 on the Beck Depression Inventory (short form), above 30 on the Referential Thinking Questionnaire, above 26 on the Catastrophizing Questionnaire, and above 37 on the Mental Fatigue Scale. Exclusion criteria included absence from more than two therapy sessions, inability to continue participation in treatment sessions, and lack of cooperation in completing therapeutic assignments. After selection, participants were informed about the research objectives, treatment procedures, and ethical considerations, and written informed consent was obtained prior to initiating the interventions. The study was conducted following approval from relevant authorities and in compliance with research ethics standards.

### *Data Collection*

Data were collected using standardized psychological instruments assessing depressive symptoms, catastrophizing, referential thinking, and mental fatigue. Depressive symptoms were measured using the short form of the Beck Depression Inventory, which assesses cognitive, emotional, and somatic aspects of depression severity. Referential thinking was assessed using a validated self-report questionnaire designed to measure maladaptive cognitive interpretations and self-referential biases. Catastrophizing was measured using a structured self-report scale evaluating exaggerated negative expectations, magnification of adverse events, and cognitive distortions related to perceived threats. Mental fatigue was assessed using the Mental Fatigue Scale (MFS), originally developed by Johansson and colleagues in 2010 in Gothenburg, Sweden. The MFS consists of 15 items covering dimensions such as general fatigue, mental exhaustion, difficulty initiating tasks, recovery from mental fatigue, concentration problems, memory difficulties, reduced thinking speed, stress sensitivity, emotional instability, irritability, sensitivity to light and sound, changes in sleep patterns, and diurnal variations. Each item is scored on a four-point Likert scale ranging from 0 (no problem) to 3 (serious problem), except for the item assessing 24-hour variations, which ranges from 0 to 2. Total scores range from 0 to 44, with higher scores indicating greater levels of mental fatigue. Cutoff classifications categorize individuals into no problem, mild problem, moderate problem, and severe problem groups. The original version demonstrated acceptable face validity and a Cronbach's alpha of 0.79. The Persian version was translated and validated in Iran, with face validity confirmed by academic experts and internal consistency reported at 0.89 using Cronbach's alpha. Test-retest reliability over a two-week interval yielded a correlation coefficient of 0.72, indicating satisfactory stability. All instruments used in this study demonstrated adequate psychometric properties in previous research and were appropriate for use in clinical and non-clinical populations.

### *Interventions*

The Schema Therapy intervention was implemented in eight structured group sessions based on Young's schema therapy model, following the Persian translation by Hamidpour and Andouz (2022). The program began with administration of the pretest, introduction of group members and the therapist, clarification of group rules, therapeutic commitments, goals, and structure, and an overview of the theoretical foundations of schema therapy. In the second session, participants' presenting problems were assessed from a schema-focused perspective, including identification of avoidance patterns, emotional fusion, and personal values, along with preparation of a list of advantages, disadvantages, and existing coping strategies. Subsequent sessions focused on identifying early maladaptive schemas and dysfunctional life patterns contributing to depressive symptoms, clarifying the role of schemas in maintaining negative life events, and applying therapeutic techniques to weaken schema-driven cognitive distortions. Empathic confrontation and limited reparenting were introduced as core relational techniques, along with schema validity testing and examination of supporting and contradictory evidence. Participants were trained to redefine schema-confirming evidence and evaluate the advantages and disadvantages of maladaptive schemas and coping styles. Experiential techniques such as imagery rescripting and therapeutic letter writing to parents were employed to process childhood memories, explore emotional experiences, and understand how early parental behaviors contributed to schema formation. Later sessions emphasized working with maladaptive

schema modes, particularly the punitive and demanding parent modes, while strengthening the healthy adult mode through limited reparenting of the vulnerable and angry child modes. Throughout the intervention, techniques were delivered through lectures, question-and-answer exchanges, role playing, and group discussion, supported by PowerPoint presentations and audiovisual materials. The final session included review and rehearsal of learned techniques with emphasis on applying adaptive coping styles and enhancing meaning in real-life contexts, followed by administration of the posttest and coordination for the two-month follow-up session.

The Cognitive Behavioral Therapy intervention was conducted in eight structured group sessions based on Hofmann's cognitive behavioral model (2003). The first session included pretest administration, introduction of group members and therapist, clarification of group rules and therapeutic commitments, and an overview of the principles of cognitive behavioral therapy. In the second session, therapeutic rapport was strengthened, primary complaints of participants with depressive symptoms were explored, and the cognitive-behavioral framework was introduced, including explanation of the relationship among cognition, emotion, and behavior. Participants collaborated in defining treatment goals and identifying target problems, agreed upon homework assignments, and were trained to record life events using the ABC model. Subsequent sessions focused on identifying and challenging automatic negative thoughts through review of dysfunctional thought records and Socratic questioning. Self-regulation and mindfulness-based awareness skills were introduced to help participants recognize underlying beliefs and identify how such beliefs are activated in specific situations, including use of the downward arrow technique to uncover core assumptions. Communication skills training was provided, emphasizing effective verbal response styles, active listening, and behavioral contracting within the group to reinforce desirable behaviors. Participants were also trained in assertiveness, problem-solving skills, and social skills as part of the behavioral component of treatment. In later sessions, greater emphasis was placed on identifying unconditional core beliefs, weakening maladaptive beliefs through structured cognitive disputation, and rating negative beliefs on a 0–100 scale to monitor cognitive change. Throughout the program, techniques were delivered using lectures, group discussion, role playing, and audiovisual presentations. The final session involved comprehensive review and practice of cognitive and behavioral techniques, with emphasis on modifying automatic negative thoughts and enhancing meaning in everyday life, followed by administration of the posttest and scheduling of the two-month follow-up assessment.

### *Data Analysis*

Quantitative data were analyzed using SPSS version 26. Data analysis was conducted at both descriptive and inferential levels. At the descriptive level, frequency distributions, percentages related to demographic characteristics, and measures of central tendency and dispersion were calculated separately for each group. At the inferential level, after examining statistical assumptions including normality, homogeneity of variances, homogeneity of covariance matrices, and sphericity, mixed-design analysis of variance was employed to assess within-group and between-group differences across time points. Multivariate analysis of variance (MANOVA) was used when appropriate to examine simultaneous effects on related dependent variables. Repeated measures analysis of variance was conducted to evaluate changes across pretest, posttest, and follow-up assessments. Bonferroni post hoc tests were applied to determine the specific

location of significant differences between groups and across measurement phases. Statistical significance was considered at the conventional alpha level.

## Findings and Results

The demographic characteristics of the participants indicated that the three groups were comparable at baseline, with no statistically significant differences across demographic variables. In terms of gender distribution, the Cognitive Behavioral Therapy group consisted of 11 women (73.3%) and 4 men (26.7%), the Schema Therapy group included 9 women (60%) and 6 men (40%), and the control group comprised 11 women (73.3%) and 4 men (26.7%), with no significant difference among groups ( $p = 0.661$ ). Regarding marital status, 10 participants (66.7%) in the Cognitive Behavioral Therapy group, 9 participants (60%) in the Schema Therapy group, and 11 participants (73.3%) in the control group were single, while 5 (33.3%), 6 (40%), and 4 (26.7%) participants in the respective groups were married; these differences were not statistically significant ( $p = 0.741$ ). Educational level distribution also showed no significant group differences ( $p = 0.930$ ). In the Cognitive Behavioral Therapy group, 4 participants (26.7%) had a high school diploma, 9 (60%) had an associate or bachelor's degree, and 2 (13.3%) held a master's or doctoral degree. In the Schema Therapy group, 3 participants (20%) had a diploma, 9 (60%) had an associate or bachelor's degree, and 3 (20%) had a master's or doctoral degree. In the control group, 5 participants (33.3%) had a diploma, 8 (53.3%) had an associate or bachelor's degree, and 2 (13.3%) had a master's or doctoral degree. The mean age of participants was 31.53 years ( $SD = 7.11$ ) in the Cognitive Behavioral Therapy group, 30.53 years ( $SD = 5.36$ ) in the Schema Therapy group, and 31.47 years ( $SD = 7.45$ ) in the control group, with no statistically significant difference among groups ( $p = 0.250$ ). These findings indicate that the three groups were demographically homogeneous prior to the intervention.

**Table 1. Descriptive Statistics of Catastrophizing by Group and Time**

Variable	Time	Cognitive Behavioral Therapy (n = 15)		Schema Therapy (n = 15)		Control (n = 15)	
		Mean	SD	Mean	SD	Mean	SD
Catastrophizing	Pretest	35.00	9.16	35.40	11.55	36.47	11.30
	Posttest	28.67	8.81	25.07	10.17	39.80	12.70
	Follow-up	27.27	8.49	25.73	9.84	40.47	11.37

The descriptive findings presented in Table 1 indicate that the mean scores of catastrophizing were relatively similar across the three groups at the pretest stage, suggesting baseline comparability. Specifically, the mean catastrophizing scores were 35.00 ( $SD = 9.16$ ) in the Cognitive Behavioral Therapy group, 35.40 ( $SD = 11.55$ ) in the Schema Therapy group, and 36.47 ( $SD = 11.30$ ) in the control group. At posttest, both experimental groups demonstrated a noticeable reduction in catastrophizing scores, with the mean decreasing to 28.67 ( $SD = 8.81$ ) in the Cognitive Behavioral Therapy group and to 25.07 ( $SD = 10.17$ ) in the Schema Therapy group. In contrast, the control group showed an increase in the mean score to 39.80 ( $SD = 12.70$ ). At the two-month follow-up, the downward trend in catastrophizing was maintained in both intervention groups, with mean scores of 27.27 ( $SD = 8.49$ ) for Cognitive Behavioral Therapy and 25.73 ( $SD = 9.84$ ) for Schema Therapy, while the control group's mean score further increased to 40.47 ( $SD = 11.37$ ). Overall, these descriptive results suggest that both therapeutic interventions were associated with sustained

reductions in catastrophizing over time, whereas catastrophizing levels in the control group increased during the same period.

**Table 2. Results of Repeated Measures Analysis of Variance for the Effectiveness of Interventions on Catastrophizing**

Variable	Source of Effect	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Catastrophizing	Group	3351.22	2	1675.61	1.17	0.320	0.053
	Time	595.57	1.14	520.25	32.53	< 0.001	0.437
	Time × Group	588.25	2.29	256.93	16.07	< 0.001	0.433

The results of the repeated measures analysis of variance presented in Table 2 indicate that the main effect of group on catastrophizing was not statistically significant,  $F(2, \dots) = 1.17$ ,  $p = 0.320$ , with a small effect size (partial  $\eta^2 = 0.053$ ), suggesting that when time was not considered, overall differences among the three groups were not significant. However, the main effect of time was statistically significant,  $F(1.14, \dots) = 32.53$ ,  $p < 0.001$ , with a large effect size (partial  $\eta^2 = 0.437$ ), indicating that catastrophizing scores changed significantly across measurement phases (pretest, posttest, and follow-up). Most importantly, the interaction effect between time and group was statistically significant,  $F(2.29, \dots) = 16.07$ ,  $p < 0.001$ , with a large effect size (partial  $\eta^2 = 0.433$ ). This significant interaction demonstrates that the pattern of change in catastrophizing over time differed significantly across the Cognitive Behavioral Therapy, Schema Therapy, and control groups. In other words, the reduction in catastrophizing observed in the intervention groups over time was significantly different from the trend observed in the control group, supporting the effectiveness of the therapeutic interventions.

**Table 3. Bonferroni Post Hoc Test for Between-Group Comparisons of Catastrophizing at Posttest**

Variable	Group	Adjusted Posttest Mean	Standard Error	Reference Group	Comparison Group	Mean Difference	p
Catastrophizing	Cognitive Behavioral Therapy	79.21	1.06	Cognitive Behavioral Therapy	Control	-8.10	< 0.001
	Schema Therapy	77.01	1.06	Schema Therapy	Control	-10.29	< 0.001
	Control	87.31	1.06	Cognitive Behavioral Therapy	Schema Therapy	2.20	0.452

The Bonferroni post hoc comparisons presented in Table 3 indicate that at the posttest stage, both intervention groups demonstrated significantly lower adjusted mean scores of catastrophizing compared to the control group. Specifically, the Cognitive Behavioral Therapy group showed a significantly lower mean score than the control group (mean difference = -8.10,  $p < 0.001$ ), and the Schema Therapy group also showed a significantly lower mean score than the control group (mean difference = -10.29,  $p < 0.001$ ). However, the difference between the Cognitive Behavioral Therapy and Schema Therapy groups was not statistically significant (mean difference = 2.20,  $p = 0.452$ ). These findings suggest that both therapeutic interventions were effective in reducing catastrophizing compared to no treatment, while their relative effectiveness did not differ significantly at posttest.

**Table 4. Pairwise Comparisons of Catastrophizing Across Time Points**

Variable	Group	Reference Time	Comparison Time	Mean Difference	p
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Catastrophizing	Cognitive Behavioral Therapy	Pretest	Posttest	6.33	< 0.001
		Pretest	Follow-up	7.73	< 0.001
		Posttest	Follow-up	1.40	0.031
	Schema Therapy	Pretest	Posttest	8.33	< 0.001
		Pretest	Follow-up	7.67	< 0.001
		Posttest	Follow-up	-0.67	0.007
	Control	Pretest	Posttest	-1.33	0.002
		Pretest	Follow-up	-2.00	< 0.001
		Posttest	Follow-up	-0.67	0.076

The pairwise comparisons across time points presented in Table 4 indicate that in the Cognitive Behavioral Therapy group, catastrophizing significantly decreased from pretest to posttest (mean difference = 6.33,  $p < 0.001$ ) and from pretest to follow-up (mean difference = 7.73,  $p < 0.001$ ). A smaller but statistically significant change was also observed between posttest and follow-up (mean difference = 1.40,  $p = 0.031$ ), suggesting continued improvement over time. In the Schema Therapy group, catastrophizing significantly decreased from pretest to posttest (mean difference = 8.33,  $p < 0.001$ ) and from pretest to follow-up (mean difference = 7.67,  $p < 0.001$ ). The difference between posttest and follow-up was also statistically significant (mean difference = -0.67,  $p = 0.007$ ), indicating slight changes between these two phases. In contrast, the control group showed a significant increase in catastrophizing from pretest to posttest (mean difference = -1.33,  $p = 0.002$ ) and from pretest to follow-up (mean difference = -2.00,  $p < 0.001$ ), while the change between posttest and follow-up was not statistically significant (mean difference = -0.67,  $p = 0.076$ ). Overall, these findings demonstrate that both Cognitive Behavioral Therapy and Schema Therapy produced significant and sustained reductions in catastrophizing over time, whereas catastrophizing tended to increase in the control group.

## Discussion and Conclusion

The present study examined the comparative effectiveness of Cognitive Behavioral Therapy (CBT) and Schema Therapy (ST) on catastrophizing among young adults with depressive symptoms. The findings indicated that both interventions produced significant reductions in catastrophizing from pretest to posttest, and these improvements were maintained at the two-month follow-up. The repeated measures analysis demonstrated a significant main effect of time and a significant interaction effect between time and group, suggesting that the pattern of change differed across the intervention and control conditions. While the main effect of group was not statistically significant when time was not considered, the significant interaction effect confirmed that the reduction trajectory in the CBT and ST groups was meaningfully distinct from the control group. Post hoc analyses further revealed that both intervention groups showed significantly lower posttest catastrophizing scores compared to the control group, whereas no statistically significant difference was found between CBT and ST at posttest. These findings collectively indicate that both therapeutic approaches were effective in reducing catastrophizing in young adults with depressive symptoms, with sustained effects over time.

The reduction of catastrophizing observed in the CBT group is consistent with the theoretical underpinnings of cognitive-behavioral models, which conceptualize catastrophizing as a cognitive distortion rooted in maladaptive appraisal processes. CBT directly targets automatic negative thoughts, dysfunctional assumptions, and core beliefs, thereby weakening catastrophic interpretations of internal and external

experiences. Previous studies have demonstrated similar effects in clinical populations. For example, CBT significantly reduced pain catastrophizing and alexithymia in chronic pain patients (6). Preoperative CBT interventions have also been shown to decrease catastrophizing and improve postoperative outcomes (5). Likewise, cognitive therapy enhanced pain self-efficacy and reduced catastrophizing among breast cancer patients (7). Evidence from web-based CBT programs further supports its effectiveness in modifying maladaptive cognitions and increasing perceived coping ability (8). Additionally, systematic evidence highlights the role of CBT in improving occupational and functional outcomes through cognitive restructuring mechanisms (9, 10). The present findings extend this body of evidence by demonstrating that CBT is also effective in addressing catastrophizing within a depressive youth population, suggesting that the cognitive mechanisms underlying catastrophizing operate similarly across pain-related and mood-related conditions.

The significant reduction in catastrophizing observed in the Schema Therapy group can be explained through the lens of schema theory, which posits that early maladaptive schemas shape persistent patterns of cognitive and emotional responding. Catastrophizing may reflect activation of schemas related to vulnerability, defectiveness, or failure, particularly in individuals with depressive symptoms. By addressing schema-level structures rather than only surface-level automatic thoughts, ST may produce deeper cognitive restructuring. Prior research supports the effectiveness of schema-based approaches in modifying maladaptive cognitive-emotional patterns. Schema Therapy has been shown to enhance pain acceptance and self-efficacy while improving emotion regulation in clinical populations (14). Emotional schemas have been identified as significant predictors of mood and anxiety symptoms, particularly when mediated by cognitive perfectionism dimensions (13). Furthermore, early maladaptive schemas have been demonstrated to mediate the relationship between attachment styles and symptom intensity (12). Mindfulness-based schema therapy has also been found effective in reducing mental pain and experiential avoidance (15). Comparative investigations have indicated that schema-focused and emotion-focused interventions can significantly reduce catastrophizing and experiential avoidance (16, 17). These findings align with the current results and suggest that schema-level modifications may contribute to sustained reductions in catastrophic thinking among depressed young adults.

Interestingly, the absence of a statistically significant difference between CBT and ST at posttest suggests that both interventions were comparably effective in reducing catastrophizing. This finding is consistent with comparative research demonstrating similar efficacy of CBT and Schema Therapy in reducing pain catastrophizing and enhancing self-efficacy among patients with chronic low back pain (18). Although the theoretical mechanisms differ—CBT emphasizing cognitive restructuring and ST targeting schema transformation—their shared focus on modifying maladaptive cognitions may account for their comparable outcomes. It is possible that for young adults with depressive symptoms, both approaches effectively disrupt catastrophic cognitive cycles, albeit through different pathways.

The maintenance of treatment effects at follow-up further strengthens the clinical significance of these findings. Sustained reduction in catastrophizing suggests that participants internalized and applied learned cognitive and emotional regulation strategies beyond the structured intervention period. Changes in cognitive appraisal processes have been shown to mediate long-term treatment outcomes in cognitive-based interventions (1). The present results are also consistent with findings from randomized clinical trials

demonstrating durable effects of CBT and related approaches in chronic conditions (11). The continued improvement observed in the CBT group between posttest and follow-up suggests progressive cognitive consolidation, whereas the relatively stable scores in the ST group indicate maintenance of schema-level change.

The increase in catastrophizing observed in the control group underscores the importance of psychological intervention in preventing the escalation of maladaptive cognitions. Without structured therapeutic input, depressive cognition may intensify over time, reinforcing negative appraisal patterns. Emotional schemas have been shown to amplify maladaptive interpretations when not addressed therapeutically (3). Additionally, experiential avoidance and deficits in self-compassion may exacerbate cognitive distortions in the absence of intervention (4). The divergence between intervention and control groups therefore highlights the protective role of structured cognitive and schema-based therapies in mitigating catastrophizing tendencies.

Overall, the findings contribute to the growing literature emphasizing the centrality of cognitive distortions in depressive symptomatology and demonstrate that both CBT and Schema Therapy offer effective and sustainable approaches for reducing catastrophizing among young adults. By targeting either dysfunctional thought patterns or deeper maladaptive schemas, both therapies appear capable of modifying the cognitive mechanisms that maintain depressive distress.

One limitation of the present study concerns the relatively small sample size, which may limit generalizability of the findings to broader clinical populations. Although the groups were statistically comparable at baseline, the use of purposive sampling restricts the ability to generalize results beyond the specific demographic context studied. Additionally, reliance on self-report measures may introduce response bias, as participants' subjective perceptions could influence reported levels of catastrophizing. The follow-up period was limited to two months, which may not capture long-term stability of treatment effects. Furthermore, potential therapist effects and differences in therapeutic alliance were not formally controlled or measured, which may have influenced outcomes.

Future research should employ larger, multi-site samples to enhance generalizability and statistical power. Extending follow-up assessments beyond two months would provide insight into the long-term durability of therapeutic gains. Investigating mediating variables such as cognitive reappraisal, emotional regulation, and schema mode changes could clarify the mechanisms underlying treatment effectiveness. Comparative studies incorporating additional therapeutic modalities, such as mindfulness-based or acceptance-based approaches, would further enrich understanding of intervention efficacy. Moreover, examining moderating factors such as gender, severity of depression, or comorbid conditions could help tailor interventions to specific subgroups of young adults.

From a clinical perspective, both Cognitive Behavioral Therapy and Schema Therapy can be recommended as effective interventions for reducing catastrophizing in young adults with depressive symptoms. Mental health professionals should consider integrating cognitive restructuring techniques with schema-focused experiential methods to address both surface-level and deep-seated cognitive patterns. Early identification and intervention targeting catastrophizing may prevent escalation of depressive symptoms and improve functional outcomes. Implementing structured group-based interventions in counseling centers and community mental health settings may enhance accessibility and cost-effectiveness. Clinicians are

encouraged to tailor therapeutic approaches based on individual cognitive profiles while ensuring continuity of care through follow-up sessions to maintain treatment gains.

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### **Authors' Contributions**

All authors equally contributed to this study.

### **Declaration of Interest**

The authors of this article declared no conflict of interest.

### **Ethical 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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