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Integrated Emotional Schema Therapy and the Unified Protocol for Executive Functioning Difficulties and Cognitive Emotion Regulation in Generalized Anxiety Disorder

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ABSTRACT

Objective: This study examined changes in self-reported executive functioning difficulties and cognitive emotion regulation following integrated Emotional Schema Therapy (EST) and the Unified Protocol (UP) among adults with generalized anxiety disorder (GAD).

Methods and Materials: A controlled pretest–posttest study with one-month follow-up was conducted among 32 adults with GAD recruited from a psychiatric treatment center in Tehran, Iran, in 2023. Participants were reportedly randomly allocated to integrated EST–UP (n = 16) or control (n = 16). The intervention comprised ten individual 60-minute sessions over 12 weeks. Outcomes were assessed using the Adult Executive Functioning Inventory and Cognitive Emotion Regulation Questionnaire–Short Form. Descriptive statistics and repeated-measures ANOVA were reported.

Findings: Executive difficulty scores decreased from 40.00 ± 1.63 to 31.50 ± 1.75 in the intervention group, compared with 39.25 ± 1.91 to 38.94 ± 2.17 in controls. Maladaptive cognitive emotion regulation decreased from 24.50 ± 2.15 to 14.88 ± 1.93, while adaptive regulation increased from 18.94 ± 1.69 to 31.75 ± 3.53. Corresponding control-group changes were minimal. At one-month follow-up, intervention-group scores were 31.81 ± 2.40, 15.38 ± 1.86, and 31.31 ± 3.20, respectively.

Conclusion: Integrated EST–UP was associated with favorable descriptive changes in executive difficulties and cognitive emotion regulation.

Keywords: Emotional Schema Therapy, Unified Protocol, Generalized Anxiety Disorder, Executive Functioning, Cognitive Emotion Regulation.

Introduction

Generalized anxiety disorder (GAD) involves persistent, difficult-to-control worry accompanied by cognitive, emotional, and physical symptoms. An emotion dysregulation model of GAD emphasizes heightened emotional intensity, limited emotional understanding, negative reactions to emotions, and maladaptive management responses (Mennin et al., 2005). This framework supports examining emotional processes alongside symptoms when evaluating psychological treatment.

Executive functioning may also be relevant to GAD. Anxiety has been associated with lower working memory capacity in a meta-analysis (Moran, 2016), and experimental work has linked anxious affect with executive difficulties (Shields et al., 2016). Studies of GAD have examined inhibitory control and disorder-related neurocognitive functioning (Hallion et al., 2017; Luo et al., 2022). However, performance on cognitive tasks and self-reported everyday executive difficulties are distinct assessment domains. A change in questionnaire scores should not automatically be interpreted as a demonstrated improvement in objective cognitive performance.

Emotion regulation and executive resources are related, although their association does not establish a simple causal sequence. Individual differences in executive functioning have been studied in relation to flexibility in selecting emotion regulation strategies (Toh & Yang, 2024). Rumination is also relevant beyond a single diagnostic category: cross-sectional research has examined its association with somatic symptom severity in adults (Seyed Alitabar & Goli, 2024). These findings support measuring specific cognitive strategies rather than assuming that a single global emotion regulation score captures all relevant change.

The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (UP) is an emotion-focused cognitive behavioral intervention addressing aversive and avoidant responses to emotion. Its procedures include mindful emotional awareness, reconsideration of automatic appraisals, changing emotion-driven behaviors, and emotional exposure (Barlow et al., 2018). A randomized trial compared UP with diagnosis-specific protocols for anxiety disorders (Barlow et al., 2017), and systematic reviews have evaluated its effects across emotional disorders and delivery formats (Ayuso-Bartol et al., 2025; Carlucci et al., 2021; Sakiris & Berle, 2019). Evidence for UP alone provides a rationale for studying adaptations, but does not establish the added value of any particular combined treatment.

Emotional schema therapy (EST) focuses on beliefs, interpretations, and responses concerning emotions, including beliefs that distress is uncontrollable, unacceptable, shameful, or enduring (Leahy, 2007, 2015). It aims to increase understanding and acceptance of emotional experience while modifying responses that maintain distress. Emotional schema theory and research link these beliefs with metacognition, anxiety, and depression (Leahy, 2019; Leahy et al., 2019). Related research has examined emotional schemas alongside mindfulness, self-compassion, and self-acceptance (Faustino et al., 2020), as well as emotional invalidation and affective distress (Schreiber & Veilleux, 2022; Westphal et al., 2016).

Integrating EST with UP may help address beliefs about emotion while providing behavioral and cognitive regulation skills. This is a proposed rationale, rather than an established mechanism of the combined intervention. The present study evaluated a ten-session integrated program in adults with GAD, focusing on self-reported working memory and inhibition difficulties and cognitive emotion regulation strategies. Anxiety severity was also assessed using the GAD-7, although numerical anxiety outcomes are not available in the reported results. The evaluation therefore concerns the executive functioning and emotion regulation outcomes presented here.

Methods and Materials

Design and Participants

The study used a controlled pretest–posttest design with a one-month follow-up and reported random allocation after convenience recruitment. Thirty-two adults seeking

treatment at the Psychiatry and Behavioral Sciences Center of Shahid Beheshti University of Medical Sciences at Imam Hussein Hospital, Tehran, in 2023 were recruited over 20 days. Sixteen participants were allocated to integrated EST plus UP and 16 to a control condition receiving no study psychotherapy during the intervention period.

Eligibility required a psychiatrist's diagnosis of GAD without another psychiatric disorder, age 20–45 years, education from a high school diploma to a bachelor's degree, medication stability for at least four weeks, and no history of psychotherapy. Exclusion criteria included unwillingness to participate, active suicidal ideation, a current substance use disorder, and severe medical or neurological conditions that could confound anxiety or executive functioning assessment. The sample size was selected pragmatically to allow 16 participants per group; a formal a priori power calculation was not reported.

Allocation was described as a lottery administered by an independent research assistant. Opaque sealed envelopes containing group assignments based on a prepared random list were opened sequentially after baseline questionnaires had been completed. Participants received oral and written information about the procedures, voluntary participation, confidentiality, and right to withdraw without losing access to psychological services. The study reports that all 32 participants completed the study requirements and that no withdrawals occurred. Assessor blinding was not described.

Procedure and Intervention

Questionnaires were administered through Porsline at baseline and after treatment. The intervention comprised ten individual one-hour sessions, generally delivered weekly over a 12-week period at Imam Hussein Educational, Research, and Treatment Center. A clinician with a master's degree in clinical psychology and specialized training in EST and UP delivered the sessions under clinical supervision. Twenty percent of audio-recorded sessions were randomly reviewed with a fidelity checklist. The integrated protocol drew on EST and UP and was reviewed by five specialists (Barlow et al., 2018; Leahy, 2015).

The program combined identification and reconsideration of emotional schemas with emotional awareness, monitoring of antecedents and consequences, cognitive flexibility, restructuring, exposure, and relapse management. Table 1 summarizes the session content and tasks. Intervention participants completed questionnaires one month after treatment and a treatment satisfaction form. Although follow-up values for both groups appear in the outcome tables, the account of follow-up questionnaire collection explicitly describes only the intervention group; control-group follow-up procedures were not clearly specified.

Table 1

Integrated EST and UP session content

Session	Focus	Content	Task
1–2	Assessment and orientation	GAD symptoms, treatment goals, and links between schemas and anxiety	Complete therapy goals form
3	Emotional schemas	Review homework and identify problematic schemas and emotional responses	Complete Leahy emotional schema questionnaire
4	Schema modification	Case conceptualization and a nonjudgmental attitude toward emotions	Write a compassionate letter to oneself
5	Emotional responses	Examine thoughts, physical sensations, and behaviors in the UP model	Complete three-component emotion model
6	Monitoring and flexibility	Identify triggers, responses, and short- and long-term consequences	Complete antecedent–response–consequence (ARC) tracking
7	Mindful awareness	Practice nonjudgmental awareness of emotional experiences	Complete emotional mindfulness form
8	Cognitive restructuring	Identify automatic thoughts and maladaptive evaluations	Identify and evaluate automatic appraisals

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9	Emotional exposure	Develop exposure exercises addressing emotional schemas	Complete emotional exposure form
10	Relapse management	Review goals, progress, skills, and barriers to practice	Summarize learned skills

Note. EST = emotional schema therapy; UP = Unified Protocol. Ten individual sessions of approximately one hour were delivered over 12 weeks.

Control participants received no study psychotherapy during the treatment period and were offered three educational and therapeutic sessions after the study. The control condition was not matched for therapist contact, treatment expectations, or structured activities. Medication stability was an entry criterion, but subsequent medication changes were not described.

Assessment Measures

1.1.1. Generalized Anxiety Disorder 7

The GAD-7 contains seven items rated from 0 (not at all) to 3 (nearly every day), yielding a total score of 0–21. Conventional severity thresholds are 5, 10, and 15 for mild, moderate, and severe symptoms, respectively. The original validation reported internal consistency of α = .92 and test–retest reliability of .83; a cutoff of 10 had sensitivity of .89 and specificity of .82 for GAD (Spitzer et al., 2006). A Persian validation supported its reliability and validity in student and clinical samples (Naeinian et al., 2011). The scale supplements clinical assessment and does not replace diagnostic evaluation. No numerical GAD-7 outcome table is presented in this study.

1.1.2. Adult Executive Functioning Inventory

The 14-item Adult Executive Functioning Inventory (ADEXI) assesses self-reported working memory and inhibition difficulties. Items are rated from 1 to 5; working memory comprises nine items (range 9–45), inhibition five items (range 5–25), and the total score ranges from 14 to 70. Higher scores indicate greater executive difficulties, so lower scores indicate improvement. The original validation reported α = .90 for working memory, .77 for inhibition, and .91 for the full scale, with test–retest correlations of .68–.72 (Holst & Thorell, 2018). The Persian validation reported internal consistency of .82–.85, test–retest correlations of .89–.90, convergent correlations of .63–.68 with the BRIEF-A, and support for a two-factor structure (Parhoon et al., 2023). These are validation-sample estimates, rather than reliability estimates calculated in the present sample.

1.1.3. Cognitive Emotion Regulation Questionnaire Short Form

The CERQ-short is an 18-item version of the original 36-item Cognitive Emotion Regulation Questionnaire (Garnefski & Kraaij, 2006; Garnefski et al., 2001). Its nine strategies have two items each, rated from 1 (almost never) to 5 (almost always), producing subscale scores of 2–10. The strategies are self-blame, blaming others, rumination, catastrophizing, putting into perspective, positive refocusing, positive reappraisal, acceptance, and refocusing on planning. Higher scores indicate greater use of the relevant strategy. The commonly used maladaptive grouping comprises self-blame, blaming others, rumination, and catastrophizing; the adaptive grouping includes the other five strategies, including acceptance. Context may nevertheless affect whether a strategy is helpful.

Persian psychometric research has evaluated the 36-item version (Abdi et al., 2012), and later research directly examined the short form's reliability, validity, factor structure, treatment sensitivity, and measurement invariance (Hasani et al., 2024). Evidence for the long form should not be treated as validation of the exact short form used here. The outcome tables contain two distinct adaptive rows both labeled putting into perspective; they are distinguished as A and B below, because the available scoring information does not identify which represents refocusing on planning. The reported adaptive composite is retained without reconstructing item-level scores.

Statistical Analysis

Means and standard deviations summarized executive difficulties and cognitive emotion regulation at baseline, posttest, and one-month follow-up. The reported inferential analysis was a group-by-time repeated-measures ANOVA. The Shapiro–Wilk, Levene, and Box tests were described as

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supporting distributional and covariance assumptions, but their numerical statistics were not provided. Mauchly tests indicated departures from sphericity, and Greenhouse–Geisser corrections were used for within-subject effects. Reported pairwise comparisons used Bonferroni adjustment within outcomes; testing across the multiple outcomes was not adjusted.

The ANOVA tables provide F statistics, numerator degrees of freedom, p values, partial eta-squared estimates, and observed power, but not denominator degrees of freedom. Several reported combinations are inconsistent with a conventional two-group, three-time-point model with 32 completers. Consequently, the inferential estimates are presented as reported and should be interpreted cautiously. The pooled time contrasts do not represent intervention-only change or directly estimate a between-group treatment contrast.

Findings and Results

Descriptive Outcomes

Table 2 presents the reported group means and standard deviations. Working memory difficulty decreased from 27.19 to 21.50 in the intervention group and from 26.50 to 26.31 in controls. Inhibition difficulty decreased from 12.81 to 10.00 and from 12.75 to 12.63, respectively. Total ADEXI scores decreased from 40.00 to 31.50 in the intervention group, compared with 39.25 to 38.94 in controls. Intervention-group follow-up means were 21.63, 10.19, and 31.81 for these three outcomes. These lower scores indicate fewer self-reported difficulties, rather than verified changes on neuropsychological tasks.

The reported maladaptive cognitive emotion regulation composite decreased from 24.50 to 14.88 in the intervention group and from 23.88 to 23.75 in controls. The adaptive composite increased from 18.94 to 31.75 in the intervention group and from 20.94 to 21.69 in controls. Corresponding intervention follow-up means were 15.38 and 31.31. Individual strategy scores generally followed these directions. The adaptive subscale labeling issue limits interpretation of the two rows labeled putting into perspective.

Table 2

Executive difficulty and cognitive emotion regulation scores by group and assessment

Outcome	EST + UP Pretest	EST + UP Posttest	EST + UP Follow-up	Control Pretest	Control Posttest	Control Follow-up
Working memory difficulties	27.19 (1.22)	21.50 (1.46)	21.63 (1.75)	26.50 (1.41)	26.31 (1.54)	26.38 (1.59)
Inhibition difficulties	12.81 (.98)	10.00 (.89)	10.19 (1.11)	12.75 (.93)	12.63 (1.02)	12.69 (1.01)
Total executive difficulties	40.00 (1.63)	31.50 (1.75)	31.81 (2.40)	39.25 (1.91)	38.94 (2.17)	39.06 (2.26)
Self-blame	5.94 (.85)	4.31 (.87)	4.44 (.89)	6.19 (1.11)	6.13 (1.09)	6.06 (1.12)
Blaming others	6.38 (1.15)	3.50 (1.59)	3.63 (1.59)	5.81 (1.22)	5.75 (1.24)	5.88 (1.31)
Rumination	6.00 (.89)	3.75 (.86)	3.81 (.83)	6.00 (1.03)	5.94 (1.12)	6.00 (1.09)
Catastrophizing	6.19 (1.11)	3.31 (1.14)	3.50 (1.16)	5.88 (1.02)	5.94 (.98)	6.00 (.97)
Maladaptive composite	24.50 (2.15)	14.88 (1.93)	15.38 (1.86)	23.88 (2.33)	23.75 (2.32)	23.94 (2.15)
Putting into perspective A	4.56 (.63)	6.19 (.83)	6.13 (.88)	4.69 (.60)	4.94 (.68)	4.81 (.54)
Positive refocusing	4.63 (.50)	5.75 (.77)	5.69 (.79)	4.44 (.81)	4.69 (1.02)	4.63 (.81)
Positive reappraisal	3.94 (1.12)	6.63 (1.63)	6.56 (1.62)	4.13 (1.26)	4.31 (1.53)	4.31 (1.54)
Acceptance	2.81 (.83)	5.94 (1.98)	5.94 (1.73)	3.50 (1.16)	3.56 (1.21)	3.63 (1.31)
Putting into perspective B	3.00 (.89)	7.25 (1.85)	7.00 (1.55)	4.19 (1.16)	4.19 (1.17)	4.25 (1.18)
Adaptive composite	18.94 (1.69)	31.75 (3.53)	31.31 (3.20)	20.94 (2.17)	21.69 (2.82)	21.63 (2.70)

Note. Values are M (SD); EST + UP = integrated intervention. Sixteen participants were allocated to each group. Follow-up was one month after treatment. Higher ADEXI scores indicate greater executive difficulties; higher CERQ scores indicate greater use of each strategy. The two rows originally labeled putting into perspective are distinguished as A and B; the identity of the refocusing-on-planning subscale is unconfirmed. Control follow-up values are retained as reported, although their collection procedures were not clearly documented.

Reported Repeated Measures Analyses

The Mauchly test results and epsilon estimates are presented in Table 3. All reported sphericity tests were significant, supporting the use of a correction for within-subject tests. The reported ANOVA results are shown in Table 4. For the group-by-time interaction, F statistics were 155.63 for working memory difficulty, 63.41 for inhibition difficulty, 160.90 for total ADEXI, 199.13 for the maladaptive composite, and 95.74 for the adaptive composite; the associated p values were all reported as .001. Interpretation of significance and effect size remains limited by the incomplete and internally inconsistent inferential reporting.

Table 3

Reported Mauchly tests and sphericity correction estimates

Outcome	Mauchly W	χ^2	df	p	ε GG	ε HF
Working memory difficulties	.13	58.46	2	.001	.54	.56
Inhibition difficulties	.33	32.35	2	.001	.60	.63
Total executive difficulties	.20	46.24	2	.001	.56	.58
Self-blame	.40	26.27	2	.001	.63	.66
Blaming others	.30	34.89	2	.001	.59	.62
Rumination	.27	37.76	2	.001	.58	.61
Catastrophizing	.26	38.75	2	.001	.58	.60
Maladaptive composite	.27	38.68	2	.001	.58	.60
Putting into perspective A	.25	39.77	2	.001	.57	.60
Positive refocusing	.69	10.65	2	.005	.74	.73
Positive reappraisal	.04	93.09	2	.001	.51	.53
Acceptance	.37	28.81	2	.001	.61	.65
Putting into perspective B	.28	37.34	2	.001	.58	.61
Adaptive composite	.21	44.78	2	.001	.56	.59

Note. GG = Greenhouse–Geisser; HF = Huynh–Feldt. Values are reported estimates. The two rows originally labeled putting into perspective are distinguished as A and B; the identity of the refocusing-on-planning subscale is unconfirmed.

Table 4

Reported repeated-measures ANOVA estimates

Outcome	Group F; p; ηp^2	Time F; df_1 / p; ηp^2	Group × time F; df_1 / p; ηp^2	Observed power G / T / G×T
Working memory difficulties	50.36; .003; .55	89.20; 1.07 .001; .85	155.63; 1.07 .001; .84	1.00 / 1.00 / 1.00
Inhibition difficulties	28.62; .008; .49	73.10; 1.20 .001; .71	63.41; 1.20 .001; .68	1.00 / 1.00 / 1.00
Total executive difficulties	50.11; .001; .62	181.68; 1.11 .001; .85	160.90; 1.11 .001; .84	1.00 / 1.00 / 1.00
Self-blame	13.99; .001; .32	37.53; 1.25 .001; .56	29.84; 1.25 .001; .50	.95 / 1.00 / 1.00
Blaming others	8.53; .007; .22	59.56; 1.18 .001; .65	59.21; 1.18 .001; .67	.81 / 1.00 / 1.00

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Rumination	20.80; .001; .41	63.68; 1.16 .001; .68	60.05; 1.16 .001; .67	1.00 / 1.00 / 1.00
Catastrophizing	22.74; .001; .43	55.17; 1.15 .001; .65	62.82; 1.15 .001; .68	1.00 / 1.00 / 1.00
Maladaptive composite	66.71; .001; .69	202.44; 1.15 .001; .87	199.13; 1.15 .001; .87	1.00 / 1.00 / 1.00
Putting into perspective A	18.35; .001; .55	26.88; 1.14 .001; .47	16.64; 1.14 .001; .36	.98 / 1.00 / .98
Positive refocusing	8.79; .006; .23	32.02; 1.53 .001; .52	14.13; 1.53 .001; .32	.82 / 1.00 / 1.00
Positive reappraisal	10.33; .003; .26	28.76; 1.02 .001; .49	21.68; 1.02 .001; .42	.87 / 1.00 / 1.00
Acceptance	9.44; .001; .24	35.76; 1.23 .001; .54	31.71; 1.23 .001; .51	.84 / 1.00 / 1.00
Putting into perspective B	16.52; .001; .36	48.32; 1.16 .001; .62	47.01; 1.16 .001; .61	.97 / 1.00 / 1.00
Adaptive composite	56.30; .001; .65	120.36; 1.12 .001; .80	95.74; 1.12 .001; .76	1.00 / 1.00 / 1.00

Note. df_1 = numerator degrees of freedom; ηp^2 = partial eta squared; G = group; T = time. Group df_1 = 1. Time-related numerator degrees of freedom were reported with Greenhouse–Geisser correction; denominator degrees of freedom were not supplied. Estimates are reproduced as reported, and several F, p, and ηp^2 combinations require verification against the original statistical output. Observed power is a reported post hoc quantity and does not establish precision or reproducibility.

Table 5 summarizes the reported Bonferroni-adjusted pooled time contrasts. Baseline-to-posttest and baseline-to-follow-up comparisons were reported as significant across outcomes, whereas posttest-to-follow-up comparisons were not. These pooled contrasts cannot establish equivalence between posttest and follow-up, demonstrate maintenance specifically within the intervention group, or resolve the uncertain documentation of control follow-up. The descriptive intervention means were similar at posttest and one month, but longer-term durability was not assessed. Anxiety symptom change cannot be quantified because numerical GAD-7 results were not supplied.

Table 5

Reported Bonferroni-adjusted pooled time comparisons

Outcome	Pretest – posttest Δ; p	Pretest – follow-up Δ; p	Posttest – follow-up Δ; p
Working memory difficulties	2.94; .001	2.84; .001	-0.9; .260
Inhibition difficulties	1.47; .001	1.34; .001	-.12; .130
Total executive difficulties	4.41; .001	4.19; .001	-.22; .099
Self-blame	.84; .001	.81; .001	-0.03; .994
Blaming others	1.47; .001	1.34; .001	-.12; .141
Rumination	1.16; .001	1.09; .001	-0.06; .503
Catastrophizing	1.41; .001	1.28; .001	-.12; .130
Maladaptive composite	4.87; .001	4.53; .001	-.34; .058
Putting into perspective A	-.94; .001	-.84; .001	0.09; .260
Positive refocusing	-.68; .001	-.62; .001	0.06; .999
Positive reappraisal	-1.44; .001	-1.41; .001	0.03; .976
Acceptance	-1.59; .001	-1.62; .001	0.3; .999
Putting into perspective B	-2.12; .001	-2.03; .001	0.9; .999
Adaptive composite	-6.78; .001	-6.53; .001	0.25; .479

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Note. Δ denotes the reported pooled mean difference across groups, rather than an intervention-only or between-group treatment contrast. Associated p values were described as Bonferroni-adjusted within outcomes. The original working memory posttest–follow-up value (−0.9), acceptance value (0.3), and putting-into-perspective B value (0.9) are inconsistent with the displayed group means; they cannot be treated as verified contrasts. The two rows originally labeled putting into perspective are distinguished as A and B; the identity of the refocusing-on-planning subscale is unconfirmed.

Discussion and Conclusion

The descriptive results suggest that adults receiving integrated EST and UP experienced fewer self-reported working memory and inhibition difficulties and reported changes in cognitive emotion regulation strategies. Control means changed relatively little. The magnitude and certainty of the treatment effect cannot be established from the current inferential reporting, however, and claims concerning anxiety reduction are not supported by a numerical anxiety outcome. The findings should therefore be regarded as preliminary observations requiring confirmation.

The conceptual rationale for integrating these approaches concerns both emotional beliefs and behavioral responses. EST addresses beliefs that emotional experiences are unacceptable, incomprehensible, or uncontrollable, whereas UP provides skills for awareness, reappraisal, reduced avoidance, and exposure (Barlow et al., 2018; Leahy, 2015). Research on metacognition and emotional schemas provides a relevant basis for considering beliefs about emotions in anxiety treatment (Leahy et al., 2019). Nevertheless, emotional schema change and other proposed mediators were not assessed separately in this study, so a synergistic mechanism cannot be inferred.

The direction of the emotion regulation findings is compatible with a broader transdiagnostic treatment literature (Sloan et al., 2017). Research on skill acquisition during UP also makes it reasonable to examine changes in how patients respond to emotions (Sauer-Zavala et al., 2021). A small uncontrolled study of UP in patients with psychosomatic disorders found improvement in selected regulation outcomes, including catastrophizing, while other strategy changes were not significant (Mazaheri et al., 2014). This supports strategy-specific evaluation, while its population and design differ from the present controlled study.

Mindful awareness, acceptance, and self-compassion may help patients engage with distressing emotions, but their distinct contributions remain untested here. A separate study of mindfulness-based cognitive therapy in breast cancer patients evaluated distress tolerance and related outcomes, illustrating the value of assessing these processes directly (Seyed Alitabar & Zadhasn, 2023). Its findings do not establish an effect of the present integrated intervention in GAD. Likewise, associations involving emotional schemas and self-compassion provide a rationale for measurement, rather than evidence that these processes mediated the observed change (Faustino et al., 2020).

The ADEXI findings concern perceived everyday executive difficulties. Evidence linking anxiety with working memory and inhibition offers a possible explanation for why these ratings might improve alongside emotional functioning (Hallion et al., 2017; Moran, 2016). However, the current study did not measure objective cognitive performance, worry-related cognitive load, or neural mechanisms. It therefore cannot establish that therapy freed cognitive resources, improved cognitive flexibility, or produced a causal sequence from executive improvement to emotion regulation. Validation research specifically recommends using executive ratings alongside other assessment methods (Holst & Thorell, 2018; Parhoon et al., 2023).

The study also does not determine whether combining EST and UP is more beneficial than either approach alone. Existing trials and reviews support further research on UP, but their findings cannot substitute for a direct comparison of the integrated intervention with its component treatments (Barlow et al., 2017; Carlucci et al., 2021; Sakiris & Berle, 2019). A future component comparison could distinguish any contribution of schema-focused work from nonspecific contact, expectations, and shared cognitive behavioral procedures.

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Limitations and Future Research

The sample was small, recruited by convenience at one center, and excluded psychiatric comorbidity. Generalization to routine clinical populations is therefore limited. The control group did not receive an attention-matched intervention. Outcomes relied on self-report, and blinding, medication changes during treatment, and systematic adverse-event monitoring were not documented. A one-month follow-up is too brief to establish durable benefit.

Reporting limitations further constrain interpretation. Numerical GAD-7 outcomes are absent, follow-up collection in the control group is not clearly documented, two adaptive strategy rows have the same label, and several pairwise values are inconsistent with the descriptive means. The ANOVA report lacks denominator degrees of freedom and contains F, p, and partial eta-squared combinations that require verification against the original statistical output. These limitations prevent definitive claims about efficacy, recovery, or sustained between-group benefit.

Future studies should use adequately powered randomized comparisons, prospectively specified outcomes, complete participant flow and analysis reporting, validated scoring procedures, and longer follow-up. A combination of symptom scales, everyday executive ratings, objective cognitive tasks, and process measures would clarify what changes and whether those changes relate to treatment benefit.

Conclusion

Integrated EST and UP was associated with favorable descriptive changes in self-reported executive difficulties and cognitive emotion regulation in this small sample of adults with GAD. Similar intervention-group means at posttest and one month suggest a pattern worth further investigation. The available results do not establish anxiety symptom improvement, the added value of integration, or durable efficacy. Confirmation requires verified analyses and stronger comparative evidence.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study reports approval by the Ethics Committee of Shahid Beheshti University of Medical Sciences (IR.SBU.REC.1402.087) and registration with the Iranian Registry of Clinical Trials (IRCT20230901059319N1). Participants provided written informed consent and were assured of confidentiality and the right to withdraw without penalty.

Transparency of Data

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

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Authors' Contributions

All authors contributed to the study conception, implementation, data collection, interpretation, manuscript preparation, and critical revision, and approved the final manuscript.

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