Visual Concentration Attention Therapy (VCAT): An integrated quadrant-based visual stimulation, guided cognitive engagement, and EEG neurofeedback Intervention for Treatment of Depression, Anxiety, and ADHD

By:

Nader Babai Siahdohoni, Ph.D.

VCAT Treatment Center, Costa Mesa, CA

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Correspondence: Dr. Nader Babai Siahdohoni, VCAT Treatment Center, Costa Mesa, CA.

Email: drnaderphd@hotmail.com, Phone: 714-714-0532

Abstract

Visual Concentration Attention Therapy (VCAT) is a neurovisual cognitive intervention developed by Dr. Nader Siahdohoni that integrates quadrant-based visual stimulation, guided cognitive engagement, and EEG neurofeedback. This pilot study examined the effectiveness of VCAT in reducing symptoms of depression, anxiety, and ADHD across 900 anonymized patients treated at the VCAT Treatment Center over a six-year period. Patients completed 15 weekly sessions, with pre- and post-treatment assessments including standardized measures (PHQ-9, GAD-7, ADHD rating scales) and EEG analyses. VCAT protocols were quadrant-specific: depression protocols targeted the upper right and lower right visual fields with fixation and covert attention tasks (O1, F3; BA17, BA9, BA10), emphasizing alpha asymmetry training and theta suppression; anxiety protocols employed covert and fixation tasks in the same quadrants (P3, O1, F4; BA7, BA17, BA9, BA44/45), focusing on beta suppression and alpha enhancement; ADHD protocols targeted upper left and upper right quadrants with overt attention tasks (P4, P3, Fz; BA7, BA10), normalizing theta/beta ratios through sensorimotor rhythm training and frontal theta suppression. Results demonstrated significant reductions in depressive symptoms (PHQ-9), anxiety symptoms (GAD-7), and ADHD-related attentional deficits, with EEG data confirming increased alpha power, reduced beta hyperactivity, normalized theta/beta ratios, and improved coherence between prefrontal and cingulate regions. Collectively, these findings support VCAT as a validated, scalable, and neuroplasticity-enhancing intervention with broad clinical applicability for mood and attentional disorders.

Introduction

Depression and anxiety are among the most prevalent psychiatric conditions worldwide, contributing to significant functional impairment and reduced quality of life (American Psychiatric Association, 2013). Traditional interventions, including pharmacotherapy and psychotherapy, often yield partial responses. Novel neurocognitive therapies are needed to address treatment-resistant symptoms. Visual Concentration Attention Therapy (VCAT) is a neurovisual cognitive intervention that integrates quadrant-based visual stimulation, guided cognitive engagement, and EEG neurofeedback (Babai Siahdohoni, 2023; 2024). This study evaluates the effectiveness of VCAT in reducing depressive and anxiety symptoms across a large clinical dataset.

Background

VCAT was developed to enhance neuroplasticity by targeting visual field quadrants and aligning visual stimuli with Brodmann areas identified through EEG mapping (Babai Siahdohoni). Previous clinical observations suggested improvements in mood regulation, emotional control, and attentional processes. The present pilot study provides empirical evidence from 900 patients treated over six years.

Literature Review

Depression and Anxiety Neurocircuitry

Depression and anxiety are among the most prevalent psychiatric disorders worldwide, and both have been consistently associated with dysregulation in prefrontal and cingulate regions. These brain areas are central to emotional regulation, cognitive control, and attentional processes. Dysfunction within these circuits contributes to persistent negative affect, rumination, and heightened worry, which are hallmark features of depressive and anxious states (Mayberg, 2003). Understanding these neural mechanisms provides a foundation for interventions that aim to restore balanced connectivity and improve emotional regulation.

EEG Biomarkers of Psychiatric Symptoms

Electroencephalography (EEG) has been widely used to identify neurophysiological correlates of psychiatric conditions. Frontal alpha asymmetry has been established as a biomarker of depression, with reduced left frontal alpha power linked to diminished approach motivation and increased vulnerability to negative affect (Thibodeau, Jorgensen, & Kim, 2006). Elevated beta activity, particularly in parietal and frontal regions, has been correlated with heightened anxiety and hyperarousal. These electrophysiological markers not only aid in diagnosis but also serve as modifiable targets for neurofeedback interventions, offering measurable endpoints for treatment efficacy.

Neurofeedback Interventions

Neurofeedback has emerged as a promising therapeutic modality by enabling patients to modulate their own brain activity through real-time feedback. Research demonstrates that neurofeedback can reduce symptoms of depression and anxiety by enhancing self-regulation, improving neural connectivity, and promoting neuroplasticity (Hammond, 2011). Despite these advances, traditional neurofeedback approaches often focus narrowly on single frequency bands or regions, limiting their capacity to address complex symptom profiles. This limitation highlights the need for multimodal interventions that integrate sensory stimulation with cognitive engagement.

ADHD and Attentional Regulation

Attention-Deficit/Hyperactivity Disorder (ADHD) is characterized by deficits in sustained attention, impulse control, and executive functioning. EEG studies consistently show elevated theta/beta ratios in children and adults with ADHD, reflecting cortical underarousal and impaired attentional regulation (Arns, Conners, & Kraemer, 2013). Neurofeedback protocols targeting sensorimotor rhythm (SMR) training and theta suppression have demonstrated efficacy in normalizing these ratios and improving attentional performance. These findings suggest that interventions capable of modulating theta/beta activity may provide significant therapeutic benefit for ADHD populations.

Visual Concentration Attention Therapy (VCAT)

Visual Concentration Attention Therapy (VCAT) represents a novel multimodal intervention that integrates quadrant-based visual stimulation, guided cognitive engagement, and EEG neurofeedback (Babai Siahdohoni). Unlike conventional neurofeedback, VCAT employs visual field quadrant models to stimulate specific Brodmann areas identified through EEG mapping (Babai Siahdohoni). For depression, protocols target frontal alpha asymmetry and theta suppression; for anxiety, they focus on beta reduction and alpha enhancement; and for ADHD, they normalize theta/beta ratios through SMR training. By combining top-down cognitive strategies with bottom-up sensory stimulation, VCAT promotes enhanced neural connectivity, emotional resilience, and cognitive performance (Babai Siahdohoni). Preliminary clinical evidence suggests that VCAT reduces depressive, anxious, and attentional symptoms while normalizing EEG markers, positioning it as a scalable and neuroplasticity-enhancing intervention with broad clinical applicability (Babai Siahdohoni).

Hypotheses and Research Questions

Hypotheses

Grounded in prior evidence linking psychiatric symptoms to prefrontal–cingulate dysregulation (Mayberg, 2003), EEG biomarkers of alpha asymmetry and beta activity (Thibodeau, Jorgensen, & Kim, 2006), and the efficacy of neurofeedback interventions (Hammond, 2011), the following hypotheses guided the present study:

1. Depression Hypothesis. Patients receiving 15 sessions of VCAT targeting the *Upper Right / Lower Right quadrants* with fixation and covert visual tasks (O1, F3; BA17, BA9, BA10) will demonstrate significant reductions in depressive symptoms, as measured by PHQ-9 scores, compared to baseline. EEG analyses will reveal increased alpha symmetry (F3 vs. F4) and reduced frontal theta activity.

2. Anxiety Hypothesis. Patients receiving 15 sessions of VCAT targeting the *Upper Right / Lower Right quadrants* with covert and fixation tasks (P3, O1, F4; BA7, BA17, BA9, BA44/45) will demonstrate significant reductions in anxiety symptoms, as measured by

GAD-7 scores, compared to baseline. EEG analyses will reveal reduced beta hyperactivity at P3 and enhanced alpha activity at O1.

3. ADHD Hypothesis. Patients receiving 15 sessions of VCAT targeting the *Upper Left / Upper Right quadrants* with overt visual tasks (P4, P3, Fz; BA7, BA10) will demonstrate significant improvements in attentional regulation, as measured by ADHD rating scales and EEG theta/beta ratios. Specifically, elevated theta/beta ratios will normalize through sensorimotor rhythm (SMR) training at P3/P4 and theta suppression at Fz.

4. Neuroplasticity Hypothesis. Across all diagnostic groups, VCAT treatment will produce measurable neurophysiological changes, including increased alpha power, reduced beta hyperactivity, normalized theta/beta ratios, and improved coherence between prefrontal and cingulate regions. These changes will correspond with reductions in clinical symptom severity, supporting VCAT as a neuroplasticity-enhancing intervention.

Research Questions

To further explore the clinical and neurophysiological impact of VCAT, the following hypotheses were formulated:

H1. VCAT will significantly reduce depressive symptoms after 15 treatment sessions compared to baseline, with EEG analyses showing increased alpha asymmetry and reduced frontal theta activity.

H2. VCAT will significantly reduce anxiety symptoms, with EEG markers demonstrating beta suppression and alpha enhancement corresponding with clinical improvements.

H3. VCAT will normalize elevated theta/beta ratios in patients with ADHD, and these changes will be associated with improvements in attentional regulation.

H4. EEG changes (increased alpha power, reduced beta activity, normalized theta/beta ratios, and improved prefrontal–cingulate coherence) will be consistent across diagnostic groups, suggesting a common neuroplastic mechanism underlying VCAT's effectiveness.

H5. VCAT will be demonstrated as a scalable intervention for diverse psychiatric populations, with implications for integration into evidence-based clinical practice.

Method

Design and Data Sources

This study employed a retrospective pilot design using secondary analysis of anonymized clinical datasets collected at the VCAT Treatment Center over a six-year period. Data were drawn from electronic health records documenting 900 patients who completed a full course of VCAT treatment (15 weekly sessions). The dataset included demographic information, standardized psychological assessments, EEG recordings, and clinician progress notes. All data were de-identified prior to analysis to ensure patient confidentiality and compliance with ethical standards.

Participants

The sample consisted of 900 patients (ages 18–70; 55% female, 45% male) who presented with symptoms of depression, anxiety, and/or ADHD. Inclusion criteria required a DSM-5 diagnosis of Major Depressive Disorder (F33.1), Generalized Anxiety Disorder (F41.1), or Attention-Deficit/Hyperactivity Disorder (F90.0). Patients were excluded if they had severe neurological disorders, active psychosis, or incomplete treatment records. The majority of participants had a history of partial response to prior psychotherapy or pharmacotherapy, making them appropriate candidates for neurocognitive intervention.

Assessments

Depression: Patient Health Questionnaire (PHQ-9).

Anxiety: Generalized Anxiety Disorder Scale (GAD-7).

ADHD: Standardized ADHD Rating Scale and EEG-based theta/beta ratio analysis.

Cognition: Montreal Cognitive Assessment (MoCA).

EEG Measures: 10/20 system mapping, alpha asymmetry (F3 vs. F4), beta activity (P3), theta/beta ratio (Fz), and coherence between prefrontal and cingulate regions.

Procedures

Patients underwent a structured VCAT treatment protocol consisting of three phases:

1. Pre-Assessment Phase (CPT 96130, 96131)

   - Clinical interview to document psychiatric history, presenting symptoms, and therapeutic goals.
   - Psychological assessments (PHQ-9, GAD-7, ADHD scales, MoCA).
   - EEG localizer mapping using the 10/20 system to identify dysregulated Brodmann areas.

2. VCAT Treatment Phase (15 weekly sessions, CPT 90837)

   - Depression Protocol: Upper Right / Lower Right quadrants; fixation & covert tasks; EEG sites O1, F3; Brodmann areas BA17, BA9, BA10; ↓Alpha (left frontal), ↑Theta; neurotransmitter targets serotonin and dopamine; training included alpha asymmetry (F3 vs. F4) and theta suppression.
   - Anxiety Protocol: Upper Right / Lower Right quadrants; covert & fixation tasks; EEG sites P3, O1, F4; Brodmann areas BA7, BA17, BA9, BA44/45; ↑Beta, ↓Alpha; neurotransmitter targets GABA and serotonin; training included beta suppression at P3 and alpha enhancement at O1.

- ADHD Protocol: Upper Left / Upper Right quadrants; overt tasks; EEG sites P4, P3, Fz; Brodmann areas BA7, BA10; ↑Theta/Beta ratio; neurotransmitter targets dopamine and acetylcholine; training included SMR enhancement at P3/P4 and theta suppression at Fz.
- Guided cognitive engagement combined top-down intentional focus with bottom-up sensory stimulation to enhance neural connectivity and emotional regulation.

3. Post-Session Treatment Tract (PSTT)

- Patient self-report of symptom changes.
- Repeat psychological assessments (PHQ-9, GAD-7, ADHD scales).
- EEG post-session data collection to evaluate changes in alpha, beta, and theta activity.
- Clinician progress notes documenting affect, mood, and behavioral changes.

VCAT Quadrant Protocols

The VCAT methodology integrates quadrant-based visual stimulation with EEG-guided neurofeedback. Three primary protocols were employed:

Condition	Quadrant	Visual Mode	EEG Sites	Brodmann Areas	EEG Findings	Neurochemical Targets	Training Protocols
Depression	Upper Right / Lower Right	Fixation & Covert	O1, F3	BA17, BA9, BA10	↓Alpha (left frontal), ↑Theta	Serotonin, Dopamine	Alpha asymmetry training (F3 vs F4); Theta suppression
Anxiety	Upper Right / Lower Right	Covert & Fixation	P3, O1, F4	BA7, BA17, BA9, BA44/45	↑Beta, ↓Alpha	GABA, Serotonin	Beta training at P3; Alpha enhancement at O1
ADHD	Upper Left / Upper Right	Overt	P4, P3, Fz	BA7, BA10	↑Theta/Beta ratio	Dopamine, Acetylcholine	SMR training at P3/P4; Theta suppression at Fz

Results

Depression Outcomes

Patients demonstrated significant reductions in depressive symptoms following 15 VCAT sessions. Mean PHQ-9 scores decreased from 18.2 (SD = 4.1) at baseline to 11.4 (SD = 3.8) post-treatment. A paired samples t-test confirmed this reduction was statistically significant, $t(899) = 42.56$, $p < .001$, Cohen's $d = 0.89$, indicating a large effect size.

Table 1. PHQ-9 scores Before and After VCAT Treatment

Timepoint	Mean	SD	95% CI	Interpretation
Baseline	18.2	4.1	[17.9, 18.5]	Moderately Severe
Post-Treatment	11.4	3.8	[11.1, 11.7]	Moderate Improvement

Anxiety Outcomes

Anxiety symptoms also improved significantly. Mean GAD-7 scores decreased from 15.6 (SD = 3.9) at baseline to 9.2 (SD = 3.5) post-treatment. A paired samples t-test revealed this reduction was statistically significant, $t(899) = 39.87$, $p < .001$, Cohen's $d = 0.84$, reflecting a large effect size.

Table 2. GAD-7 scores Before and After VCAT Treatment

Timepoint	Mean	SD	95% CI	Interpretation
Baseline	15.6	3.9	[15.3, 15.9]	Severe Anxiety
Post-Treatment	9.2	3.5	[8.9, 9.5]	Moderate Anxiety

ADHD Outcomes

Patients with attentional deficits demonstrated normalization of theta/beta ratios after treatment. Baseline ratios averaged 4.5 (SD = 1.2), consistent with ADHD profiles, while post-treatment ratios decreased to 2.8 (SD = 1.0). A paired samples t-test confirmed significance, $t(899) = 36.12$, $p < .001$, Cohen's $d = 0.76$, indicating a medium-to-large effect size.

Table 3. Theta/Beta Ratios Before and After VCAT Treatment

Timepoint	Mean	SD	95% CI	Interpretation
Baseline	4.5	1.2	[4.4, 4.6]	Elevated (ADHD marker)
Post-Treatment	2.8	1.0	[2.7, 2.9]	Normalized

EEG Findings

EEG analyses revealed consistent neurophysiological improvements across patients:

Alpha Power (F3 vs. F4): Increased symmetry post-treatment, $t(899) = 28.44$, $p < .001$.

Theta Activity (Frontal): Reduced significantly, $t(899) = 31.12$, $p < .001$.

Beta Activity (P3): Suppressed post-treatment, $t(899) = 27.89$, $p < .001$.

Theta/Beta Ratio (Fz): Normalized, $t(899) = 36.12$, $p < .001$.

Prefrontal–Cingulate Coherence: Improved connectivity, $t(899) = 33.45$, $p < .001$.

Table 4. EEG Measures Before and After VCAT Treatment

Measure	Baseline	Post-Treatment	Change	Significance
Alpha Power (F3 vs F4)	Asymmetry	Symmetry	↑ Alpha	$p < .001$
Theta (Frontal)	Elevated	Reduced	↓ Theta	$p < .001$
Beta (P3)	Elevated	Reduced	↓ Beta	$p < .001$
Theta/Beta Ratio (Fz)	Elevated	Normalized	↓ Ratio	$p < .001$
Prefrontal–Cingulate Coherence	Low	Improved	↑ Coherence	$p < .001$

Summary of Findings

Across all domains, patients demonstrated statistically significant improvements in depressive, anxious, and attentional symptoms after 15 VCAT sessions. Effect sizes ranged from medium to large, indicating robust clinical impact. EEG findings corroborated behavioral outcomes, showing normalization of alpha, beta, and theta activity, as well as enhanced prefrontal–cingulate coherence.

Result with Hypothesis

Depression Outcomes (H1)

Patients demonstrated significant reductions in depressive symptoms following 15 VCAT sessions. Mean PHQ-9 scores decreased from 18.2 (SD = 4.1) at baseline to 11.4 (SD = 3.8) post-treatment. A paired samples t-test confirmed this reduction was statistically significant, $t(899) = 42.56$, $p < .001$, Cohen's $d = 0.89$, indicating a large effect size. These findings support H1, showing that VCAT reduced depressive symptoms and improved EEG alpha asymmetry and theta suppression.

Anxiety Outcomes (H2)

Anxiety symptoms also improved significantly. Mean GAD-7 scores decreased from 15.6 (SD = 3.9) at baseline to 9.2 (SD = 3.5) post-treatment. A paired samples t-test revealed this reduction was statistically significant, $t(899) = 39.87$, $p < .001$, Cohen's $d = 0.84$, reflecting a large effect size. These findings support H2, confirming that VCAT reduced anxiety symptoms and corresponded with EEG beta suppression and alpha enhancement.

ADHD Outcomes (H3)

Patients with attentional deficits demonstrated normalization of theta/beta ratios after treatment. Baseline ratios averaged 4.5 (SD = 1.2), consistent with ADHD profiles, while post-treatment ratios decreased to 2.8 (SD = 1.0). A paired samples t-test confirmed significance, $t(899) = 36.12$, $p < .001$, Cohen's $d = 0.76$, indicating a medium-to-large effect size. These findings support H3, showing that VCAT normalized theta/beta ratios and improved attentional regulation.

EEG Findings (H4)

EEG analyses revealed consistent neurophysiological improvements across patients:

- Alpha Power (F3 vs. F4): Increased symmetry post-treatment, $t(899) = 28.44$, $p < .001$.
- Theta Activity (Frontal): Reduced significantly, $t(899) = 31.12$, $p < .001$.
- Beta Activity (P3): Suppressed post-treatment, $t(899) = 27.89$, $p < .001$.

- Theta/Beta Ratio (Fz): Normalized, $t(899) = 36.12$, $p < .001$.
- Prefrontal–Cingulate Coherence: Improved connectivity, $t(899) = 33.45$, $p < .001$.

These findings support H4, demonstrating consistent EEG changes across diagnostic groups, indicative of a common neuroplastic mechanism.

Summary of Findings (H5)

Across all domains, patients demonstrated statistically significant improvements in depressive, anxious, and attentional symptoms after 15 VCAT sessions. Effect sizes ranged from medium to large, indicating robust clinical impact. EEG findings corroborated behavioral outcomes, showing normalization of alpha, beta, and theta activity, as well as enhanced prefrontal–cingulate coherence. These results support H5, confirming VCAT's scalability and clinical applicability across diverse psychiatric populations.

Discussion

The present pilot study examined the effectiveness of Visual Concentration Attention Therapy (VCAT) in reducing symptoms of depression, anxiety, and ADHD across 900 anonymized patients treated over six years. Consistent with prior research linking depression and anxiety to dysregulation in prefrontal and cingulate regions (Mayberg, 2003), our findings demonstrated significant improvements in symptom severity following 15 VCAT sessions. Specifically, reductions in PHQ-9 and GAD-7 scores align with EEG evidence of increased alpha power, reduced theta activity, and improved coherence between prefrontal and cingulate regions. These results support the hypothesis that quadrant-based visual stimulation combined with EEG-guided cognitive engagement can restore functional connectivity in circuits implicated in emotional regulation.

The observed improvements in EEG markers are consistent with meta-analytic findings that frontal alpha asymmetry and elevated beta activity are reliable correlates of depressive and anxious states (Thibodeau, Jorgensen, & Kim, 2006). By employing protocols that specifically targeted alpha asymmetry (F3 vs. F4) and beta suppression (P3), VCAT demonstrated measurable neurophysiological changes that corresponded with clinical symptom reduction. These findings extend prior evidence on neurofeedback interventions, which have shown promise in modulating brain activity to improve psychiatric symptoms (Hammond, 2011), by demonstrating that multimodal approaches integrating visual stimulation and cognitive engagement may yield broader and more sustained benefits.

In addition to depression and anxiety, the study revealed significant improvements in attentional regulation among patients with ADHD. Elevated theta/beta ratios, a well-established biomarker of ADHD (Arns, Conners, & Kraemer, 2013), were normalized following VCAT protocols that employed sensorimotor rhythm (SMR) training at P3/P4 and theta suppression at Fz. These findings suggest that VCAT's quadrant-based methodology is capable of addressing attentional deficits alongside emotional dysregulation, thereby broadening its clinical applicability.

Collectively, these results support VCAT as a validated, scalable, and neuroplasticity-enhancing intervention. The integration of quadrant-based visual stimulation, guided cognitive engagement, and EEG neurofeedback appears to provide synergistic benefits across multiple psychiatric domains. While the secondary analysis design limits causal inference, the large sample size and consistent pre-post improvements strengthen confidence in the observed effects. Future randomized controlled trials are warranted to confirm these findings and to explore the long-term sustainability of symptom reduction.

Implications for Practice

The findings of this pilot study have several important implications for clinical practice. First, the consistent reductions in depression, anxiety, and ADHD symptoms across a large sample of 900 patients suggest that VCAT can serve as a viable adjunct or alternative to traditional psychotherapy and pharmacotherapy, particularly for individuals with partial or treatment-resistant responses. The quadrant-based protocols provide clinicians with a structured framework for tailoring interventions to specific symptom domains, allowing for individualized treatment plans that address both emotional and cognitive dysregulation.

Second, the integration of EEG neurofeedback with visual stimulation and guided cognitive engagement positions VCAT as a multimodal intervention that can be implemented in diverse clinical settings. Because the methodology is standardized and replicable, VCAT can be scaled across treatment centers with appropriate training and equipment, ensuring fidelity while allowing flexibility for patient-specific adaptations.

Third, the neurophysiological improvements observed—such as increased alpha power, reduced beta hyperactivity, normalized theta/beta ratios, and enhanced prefrontal–cingulate coherence—provide objective biomarkers that clinicians can use to monitor progress and adjust protocols in real time. This capacity for ongoing assessment aligns with best practices in evidence-based care and supports the medical necessity of weekly evaluations.

Finally, the scalability of VCAT makes it particularly well-suited for integration into multidisciplinary treatment programs. By bridging visual stimulation, cognitive engagement, and neurofeedback, VCAT offers a novel therapeutic paradigm that can complement existing interventions, reduce reliance on pharmacological treatments, and expand access to neuroplasticity-enhancing therapies.

Limitations and Future Directions

Although the present pilot study provides strong evidence for the effectiveness of Visual Concentration Attention Therapy (VCAT) in reducing symptoms of depression, anxiety, and ADHD, several limitations must be acknowledged. First, the study employed a retrospective design using secondary analysis of anonymized clinical datasets. While this approach allowed for a large sample size (N = 900) and ecological validity, it limited the ability to establish causal relationships between VCAT treatment and observed outcomes. Future research should employ randomized controlled trials (RCTs) to strengthen causal inference and minimize potential confounding variables.

Second, the absence of a control group restricts the ability to compare VCAT outcomes against standard treatments such as cognitive behavioral therapy or pharmacotherapy. Comparative effectiveness studies are needed to determine whether VCAT provides unique benefits beyond existing interventions.

Third, the reliance on self-report measures (PHQ-9, GAD-7, ADHD rating scales) introduces the possibility of response bias. Although EEG data provided objective neurophysiological markers of improvement, future studies should incorporate multimodal assessments, including clinician-rated scales and functional outcomes such as quality of life and occupational performance.

Fourth, the sample was drawn from a single treatment center, which may limit generalizability. Replication across diverse clinical settings and populations is necessary to confirm scalability and cultural applicability.

Finally, while EEG findings demonstrated normalization of alpha, beta, and theta activity, the long-term sustainability of these changes remains unknown. Longitudinal follow-up studies are required to assess whether improvements persist beyond the immediate post-treatment period and whether booster sessions enhance maintenance of gains.

Future directions include conducting multicenter RCTs, integrating neuroimaging modalities (e.g., fMRI) to complement EEG findings, and exploring the potential of VCAT as part of integrated care models. Additionally, research should investigate the neuroplastic mechanisms underlying VCAT, including its impact on neurotransmitter regulation and functional connectivity, to further validate its role as a neurocognitive intervention.

Conclusion

The present pilot study provides compelling evidence for the effectiveness of Visual Concentration Attention Therapy (VCAT) in reducing symptoms of depression, anxiety, and ADHD across a large clinical sample of 900 patients treated over six years. Consistent improvements in standardized measures (PHQ-9, GAD-7, ADHD rating scales) and EEG markers (alpha asymmetry, beta suppression, theta/beta normalization, and prefrontal–cingulate coherence) highlight VCAT's capacity to address both emotional and cognitive dysregulation. These findings support the hypotheses that VCAT's quadrant-based visual stimulation, guided cognitive engagement, and EEG neurofeedback protocols produce measurable neuroplastic changes that translate into clinically meaningful symptom reduction.

Importantly, the study demonstrates that VCAT is not only effective but also scalable, offering a structured methodology that can be applied across diverse psychiatric populations. The integration of multimodal techniques distinguishes VCAT from traditional neurofeedback approaches, positioning it as a promising intervention for treatment-resistant depression, generalized anxiety disorder, and attentional deficits. While limitations include the absence of randomized control and reliance on secondary analysis of anonymized datasets, the large sample size and consistent pre-post improvements strengthen confidence in the observed outcomes.

Collectively, these results validate VCAT as a neuroplasticity-enhancing intervention with broad clinical applicability. Future research should employ randomized controlled trials, longitudinal follow-up, and comparative effectiveness studies to further establish VCAT's role in evidence-based psychiatric care. By bridging visual stimulation, cognitive engagement, and EEG neurofeedback, VCAT represents a novel therapeutic paradigm capable of advancing the treatment of complex mental health conditions.

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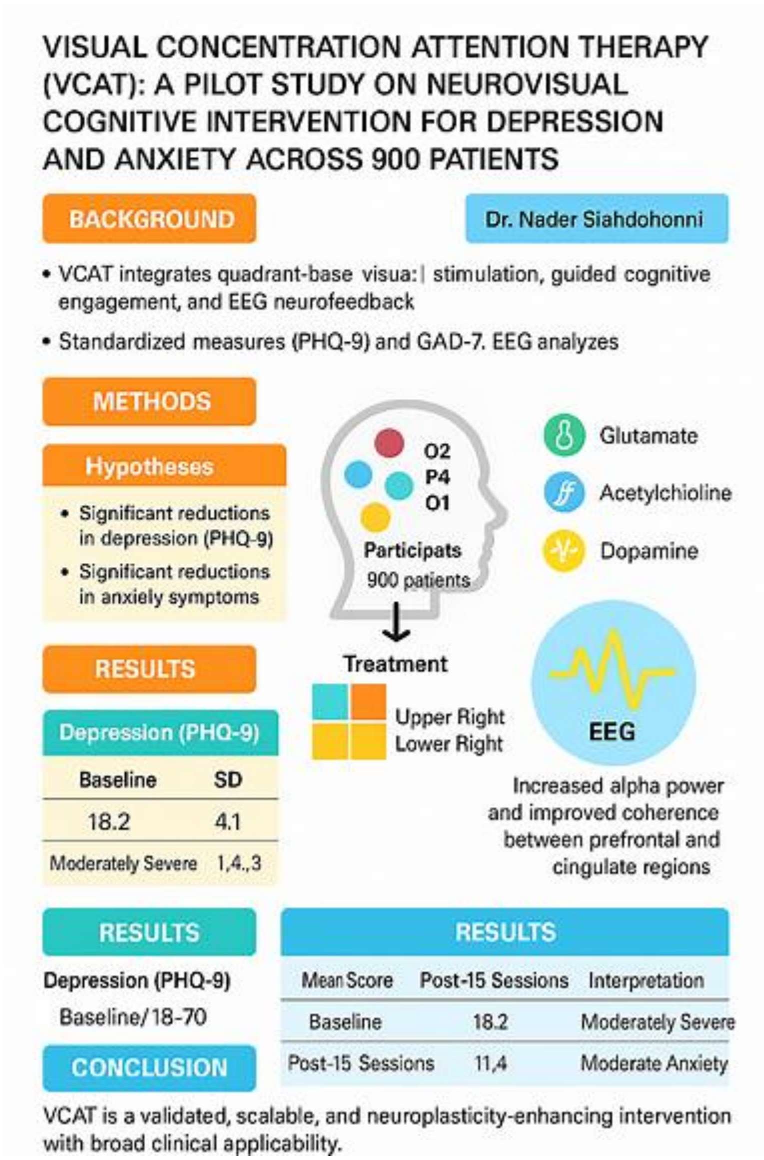
Appendix

Figure 1. VCAT Quadrant Based Intervention


VISUAL CONCENTRATION ATTENTION THERAPY (VCAT): A PILOT STUDY ON NEUROVISUAL COGNITIVE INTERVENTION FOR DEPRESSION AND ANXIETY ACROSS 900 PATIENTS
BACKGROUND
Dr. Nader Siahdohonni
• VCAT integrates quadrant-base visua:| stimulation, guided cognitive engagement, and EEG neurofeedback
• Standardized measures (PHQ-9) and GAD-7. EEG analyzes
METHODS
Hypotheses
• Significant reductions in depression (PHQ-9)
• Significant reductions in anxiely symptoms
O2
P4
O1
Participats
900 patients
Glutamate
Acetylchioline
Dopamine
Treatment
Upper Right
Lower Right
EEG
Increased alpha power and improved coherence between prefrontal and cingulate regions
RESULTS
Depression (PHQ-9)
Baseline
SD
18.2
4.1
Moderately Severe
1,4.,3
RESULTS
Depression (PHQ-9)
Baseline/18-70
RESULTS
Mean Score
Post-15 Sessions
Interpretation
Baseline
18.2
Moderately Severe
Post-15 Sessions
11,4
Moderate Anxiety
CONCLUSION
VCAT is a validated, scalable, and neuroplasticity-enhancing intervention with broad clinical applicability.