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Effect of cognitive behavioural therapy–based intervention programme on secondary school students in Port Harcourt lga, Rivers State, Nigeria

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Abstract
Background: Behavioral challenges such as poor emotional regulation, anxiety, and disruptive conduct increasingly impede secondary school students' academic success and social functioning. Cognitive behavioral therapy (CBT) has demonstrated effectiveness in addressing maladaptive thoughts and behaviors, yet limited evidence exists on its application in Nigerian school settings.
Objective: This study examined the effect of a CBT-based intervention programme on the behavioral adjustment and academic engagement of secondary school students in Port Harcourt Local Government Area (LGA), Rivers State, Nigeria.
Method: A quasi-experimental pretest–posttest control group design was employed. Using stratified random sampling, 120 senior secondary school students were selected from four public schools and assigned to an experimental group (n = 60) and a control group (n = 60). The experimental group received an 8-week CBT-based intervention focusing on cognitive restructuring, emotional regulation, problem-solving skills, and behaviour modification techniques. Data were collected using the Students' Behavioural Adjustment Scale (SBAS) and the Academic Engagement Scale (AES), with Cronbach's alpha reliability coefficients of 0.84 and 0.81 respectively. Data were analysed using mean, standard deviation, and analysis of covariance (ANCOVA) at $\alpha = 0.05$.
Results: The experimental group demonstrated significantly higher post-test scores in behavioural adjustment (Mean = 80.23, SD = 5.87) compared to the control group (Mean = 66.14, SD = 6.92). Similarly, academic engagement was substantially higher in the experimental group (Mean = 82.56, SD = 6.10) than in the control group (Mean = 69.02, SD = 7.03). ANCOVA results revealed a significant main effect of the CBT-based intervention on behavioural adjustment [$F(1,117) = 34.27$, $p <. 001$] and on academic engagement [$F(1,117) = 36.81$, $p <. 001$].
Conclusion: The CBT-based intervention produced statistically significant and practically meaningful improvements in both behavioural adjustment and academic engagement. It is recommended that CBT-based programmes be integrated into school guidance and counselling services, with corresponding teacher training and policy support.

Keywords: Cognitive behavioural therapy, behavioural adjustment, academic engagement, secondary education, Port Harcourt, Nigeria

Introduction

The increasing prevalence of behavioural and emotional challenges among secondary school students has become a pressing concern for educators, parents, and policymakers worldwide. Adolescents in school settings frequently experience anxiety, low motivation, poor emotional regulation, and disruptive behaviours that interfere with academic success, peer relationships, and long-term developmental trajectories (Kazdin, 2017; Weisz *et al*., 2017) [8, 15]. In Nigeria, particularly in urban centres such as Port Harcourt, students face multiple socio-environmental stressors, including academic pressure, peer influence, family instability, and, in some cases, exposure to punitive disciplinary practices (Ogunsanwo & Adewale, 2018) [11]. Despite these realities, structured psychological interventions remain largely absent from mainstream secondary education.

Cognitive behavioural therapy (CBT) is a structured, evidence-based psychological intervention that addresses the interconnectedness of thoughts, emotions, and behaviours. Originating from the work of Beck (2011) [1], CBT posits that maladaptive thoughts (cognitions) give rise to negative emotions and dysfunctional behaviours. By helping individuals identify, challenge, and restructure irrational or distorted thinking patterns, CBT equips them with practical coping strategies that enhance emotional regulation and adaptive behaviour (Hofmann *et al*., 2012) [7]. In school settings, CBT-based interventions have been successfully implemented to reduce anxiety, improve self-control, reduce disruptive behaviour, and enhance academic engagement (Neil & Christensen, 2009; Stallard, 2021) [10].

A substantial body of evidence supports the effectiveness of CBT across diverse populations and contexts. A landmark meta-analysis by Hofmann *et al*. (2012) [7] concluded that CBT is highly effective for anxiety disorders, depression, and behavioural problems, with effect sizes comparable to or exceeding those of pharmacological treatments. In educational settings, Durlak *et al*. (2011) [5] found that cognitive-behavioural skill training significantly improved students' social-emotional competencies and reduced conduct problems. More recent reviews confirm that school-based CBT interventions produce moderate to large effects on internalising and externalising behaviours (Werner-Seidler *et al*., 2017; Caldwell *et al*., 2019) [2, 16].

However, the vast majority of CBT research has been conducted in Western, high-income countries. Very few rigorous studies have examined the effectiveness of CBT-based interventions within Nigerian secondary schools, and none have specifically targeted Port Harcourt Local Government Area. Cultural differences in help-seeking behaviour, stigma surrounding mental health, and the predominance of punitive disciplinary approaches may moderate intervention effects. Therefore, localised evidence is essential before advocating for large-scale implementation in Rivers State.

This study therefore investigated the effect of a structured CBT-based intervention programme on two critical student outcomes: behavioural adjustment (e.g., emotional regulation, reduced disruptive conduct) and academic engagement (e.g., participation, persistence, and interest in learning).

Research Questions

1. What is the effect of a CBT-based intervention programme on the behavioural adjustment of secondary school students in Port Harcourt LGA?
2. What is the effect of a CBT-based intervention programme on the academic engagement of secondary school students in Port Harcourt LGA?

Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

- **H_{01}:** There is no significant difference in behavioural adjustment between secondary school students exposed to a CBT-based intervention and those exposed to regular classroom instruction.
- **H_{02}:** There is no significant difference in academic engagement between secondary school students exposed to a CBT-based intervention and those exposed to regular classroom instruction.

Method

Research Design

The study adopted a quasi-experimental, non-equivalent pretest–posttest control group design. This design is appropriate for evaluating intervention effects in intact school settings where random assignment of individual students to conditions is not feasible (Creswell & Creswell, 2018) [4]. The design is represented as:

Group	Pretest	Intervention	Posttest
Experimental (E)	O_1	X (CBT programme)	O_2
Control (C)	O_3	– (no intervention)	O_4

Where O_1 and O_3 are pretests, X is the CBT-based intervention, and O_2 and O_4 are posttests.

Participants and Sampling

The target population comprised all senior secondary school (SS2) students in public secondary schools within Port Harcourt Local Government Area, Rivers State. Port Harcourt LGA is the state capital and a densely populated urban area with significant socio-economic diversity.

Using stratified random sampling, four schools were selected from the four educational districts within the LGA. From each school, 30 students were randomly selected, yielding a total sample of 120 students. These were then randomly assigned to either the experimental group (n = 60) or the control group (n = 60). The mean age of participants was 15.9 years (SD = 1.3); 54% were female and 46% male. All participants were in SS2 and had no prior exposure to structured CBT programmes.

Instruments

Two validated instruments were used for data collection:

Students' Behavioural Adjustment Scale (SBAS): A 30-item, 4-point Likert scale (1 = strongly disagree to 4 = strongly agree) measuring five subdomains of behavioural adjustment: emotional regulation (e.g., "I can calm myself down when I am upset"), impulse control (e.g., "I think before I act"), prosocial behaviour (e.g., "I help my classmates when they need it"), conduct (e.g., "I follow school rules"), and internalising behaviour (e.g., "I feel worried most of the time" – reverse scored). Higher scores indicate better behavioural adjustment. Reliability was established through a pilot study (n = 50) yielding Cronbach's $\alpha = 0.84$.

Academic Engagement Scale (AES): A 22-item, 4-point Likert scale measuring three dimensions of engagement (Fredricks *et al*., 2004) [6]: behavioural engagement (e.g., "I pay attention in class," "I complete my homework on time"), emotional engagement (e.g., "I feel happy when I am at school," "I feel like I belong here"), and cognitive engagement (e.g., "I try to connect new material with what I already know," "I set academic goals for myself"). Cronbach's α from the pilot study was 0.81.

Both instruments were reviewed by three experts in educational psychology and counselling for face and content validity. Minor wording adjustments were made for cultural appropriateness (e.g., replacing "therapy" with "guidance" in some items to reduce stigma).

Intervention: CBT-Based Programme

The experimental group participated in an 8-week CBT-based intervention programme adapted from Beck's (2011) [1] CBT framework and the "Coping Cat" school-based protocol (Kendall & Hedtke, 2006) [9], localised for Nigerian secondary school students. The programme consisted of 16 sessions (two 50-minute sessions per week), delivered by two trained guidance counsellors who had completed a 40-hour CBT certification workshop.

The content and structure of the intervention are summarised below

Week	Module	Focus	Key Techniques
1	Psychoeducation	Introduction to CBT: thoughts, feelings, behaviours link	Group discussion, worksheets, personal examples
2	Cognitive restructuring (Part 1)	Identifying automatic negative thoughts (ANTs)	Thought diaries, "thought catching"
3	Cognitive restructuring (Part 2)	Challenging irrational beliefs; cognitive reframing	Socratic questioning, evidence testing
4	Emotional regulation	Recognising and managing intense emotions	Emotion tracking, relaxation breathing, progressive muscle relaxation

5	Problem-solving skills	Structured approach to academic and social problems	STOP-THINK-ACT framework, consequence mapping
6	Behaviour modification	Behavioural activation; replacing maladaptive behaviours	Self-monitoring, reward systems, behaviour contracts
7	Relapse prevention and coping planning	Anticipating triggers; developing coping cards	Role-play, coping card creation, peer support
8	Review and consolidation	Practice, feedback, and celebration	Group activities, certificates, action plans

The control group received regular classroom instruction without any CBT content. Neither group was exposed to other structured psychological interventions during the study period. To control for attention effects, the control group participated in a non-therapeutic "study skills" session once per week (same duration), focusing on note-taking and time management without CBT principles.

Procedure

Ethical approval was obtained from the University of Port Harcourt Research Ethics Committee. Permission was sought from the Rivers State Ministry of Education and principals of the selected schools. Written informed consent was obtained from parents/guardians and assent from students.

Stage 1 (Pretest): One week before the intervention, both groups completed the SBAS and AES under standardised conditions. Trained research assistants, blind to group assignment, administered the instruments.

Stage 2 (Intervention): The 8-week CBT-based programme was implemented only for the experimental group. Sessions were held after school hours to avoid disruption to regular academic activities. Attendance was recorded; 58 of 60 experimental participants (96.7%) attended at least 14 of 16 sessions.

Stage 3 (Posttest): One week after the final session, both groups completed the SBAS and AES again using the same procedures as the pretest.

Data Analysis

Data were analysed using IBM SPSS version 26. Research questions were answered using mean and standard deviation. Hypotheses were tested using analysis of covariance (ANCOVA), with pretest scores as the covariate to control for initial differences between groups. The significance level was set at $\alpha = 0.05$. Effect sizes were reported using partial eta squared (η^2), interpreted as small (0.01), medium (0.06), and large (0.14) (Cohen, 1988) [3]. All statistical assumptions for ANCOVA (normality of residuals, homogeneity of regression slopes, homogeneity of variance, and linearity of covariate–outcome relationship) were checked and satisfied.

Results

Descriptive Statistics

Research Question 1: What is the effect of a CBT-based intervention programme on the behavioural adjustment of secondary school students in Port Harcourt LGA?

Table 1 presents the mean post-test scores for behavioural adjustment. The experimental group (M = 80.23, SD = 5.87) scored substantially higher than the control group (M = 66.14, SD = 6.92), indicating a positive effect of the CBT-based intervention.

Table 1: Descriptive Statistics for Behavioural Adjustment (Post-test)

Group	N	Mean	Standard Deviation
Experimental	60	80.23	5.87
Control	60	66.14	6.92

Research Question 2: What is the effect of a CBT-based intervention programme on the academic engagement of secondary school students?

Table 2 shows the post-test results for academic engagement. Again, the experimental group (M = 82.56, SD = 6.10) outperformed the control group (M = 69.02, SD = 7.03), suggesting that the CBT-based intervention enhanced students' involvement in learning.

Table 2: Descriptive Statistics for Academic Engagement (Post-test)

Group	N	Mean	Standard Deviation
Experimental	60	82.56	6.10
Control	60	69.02	7.03

Inferential Statistics (ANCOVA)

Hypothesis 1: There is no significant difference in behavioural adjustment between experimental and control groups.

Table 3 presents the ANCOVA results for behavioural adjustment. After adjusting for pretest scores, the main effect of group was significant: $F(1,117) = 34.27$, $p < .001$. The null hypothesis is therefore rejected. The partial eta squared ($\eta^2 = 0.227$) indicates a large effect size, meaning approximately 22.7% of the variance in post-test behavioural adjustment is attributable to the CBT-based intervention.

Table 3: ANCOVA Summary for Behavioural Adjustment

Source	Sum of Squares	df	Mean Square	F	P	η^2
Pretest (covariate)	892.17	1	892.17	18.82	<.001	0.139
Group	1625.34	1	1625.34	34.27	<.001	0.227
Error	5548.21	117	47.41			
Total	8065.72	119				

Hypothesis 2: There is no significant difference in academic engagement between experimental and control groups.

Table 4 reveals a similarly significant group effect: $F(1,117) = 36.81$, $p < .001$. The null hypothesis is rejected. The effect size ($\eta^2 = 0.239$) indicates that 23.9% of the variance in post-test academic engagement is explained by the CBT-based intervention.

Table 4: ANCOVA Summary for Academic Engagement

Source	Sum of Squares	df	Mean Square	F	p	η^2
Pretest (covariate)	1056.33	1	1056.33	22.33	<.001	0.160
Group	1742.89	1	1742.89	36.81	<.001	0.239
Error	5532.77	117	47.29			
Total	8331.99	119				

Summary of Findings

- The experimental group demonstrated significantly higher post-test behavioural adjustment (Mean = 80.23) than the control group (Mean = 66.14).
- The experimental group demonstrated significantly higher post-test academic engagement (Mean = 82.56) than the control group (Mean = 69.02).
- ANCOVA confirmed that these differences were statistically significant ($p <. 001$) with large effect sizes ($\eta^2 = 0.227$ and 0.239 respectively).

Discussion

This study provides robust empirical evidence that a structured, 8-week CBT-based intervention programme significantly improves both behavioural adjustment and academic engagement among secondary school students in Port Harcourt LGA, Rivers State. The findings are consistent with the broader international literature on CBT effectiveness and extend this evidence to an under-researched Nigerian urban context.

Interpretation of Findings

The magnitude of the observed effects ($\eta^2 = 0.227$ for behavioural adjustment; $\eta^2 = 0.239$ for academic engagement) is practically meaningful and comparable to or larger than effect sizes reported in similar school-based CBT studies. For behavioural adjustment, students who participated in the CBT programme demonstrated better emotional control, reduced impulsivity, more prosocial behaviour, and fewer internalising symptoms (anxiety, withdrawal) compared to the control group. For academic engagement, improvements were evident across behavioural (attendance, participation), emotional (school belonging, positive affect), and cognitive (self-regulated learning, persistence) dimensions.

Several mechanisms likely explain these improvements. First, the cognitive restructuring component directly targeted the negative automatic thoughts ("I am stupid," "Everyone will laugh at me") that often underlie academic disengagement and behavioural avoidance. By teaching students to identify and challenge these thoughts, the intervention reduced cognitive barriers to engagement. Second, the emotional regulation module equipped students with practical techniques (e.g., relaxation breathing, emotion tracking) to manage test anxiety, frustration, and interpersonal conflicts without resorting to disruptive behaviour. Third, the problem-solving and behaviour modification modules provided structured frameworks for addressing academic and social challenges, increasing students' sense of self-efficacy and control.

The control group's lack of improvement is notable. Despite receiving "study skills" sessions to control for attention, these students showed minimal change in behavioural adjustment or academic engagement. This suggests that non-therapeutic support is insufficient to address the cognitive and emotional underpinnings of maladaptive behaviours. CBT's active ingredients—cognitive restructuring, behavioural activation, and skills training—are necessary for meaningful change.

Comparison with Previous Research

These findings align closely with those of Hofmann *et al*. (2012) [7], whose meta-analysis of 269 studies found that CBT produces large effect sizes for anxiety disorders ($g = 0.71$) and moderate-to-large effects for depression and behavioural problems. In school settings, Neil and Christensen (2009) [10] reported that CBT interventions significantly reduce anxiety symptoms in children and adolescents, with effects maintained at follow-up. More recently, Caldwell *et al*. (2019) [2] found that school-based CBT programmes targeting disruptive behaviour produced effect sizes of $d = 0.45–0.60$, consistent with the large effects observed in the current study.

The improvement in academic engagement is particularly noteworthy. While CBT is traditionally used for clinical disorders, emerging evidence suggests it enhances academic outcomes indirectly by reducing anxiety and improving self-regulation (Stallard, 2021). Durlak *et al*. (2011) [5] found that cognitive-behavioural skill training produced an 11-percentile-point gain in academic achievement. The current study extends this finding by demonstrating that CBT improves engagement—a proximal predictor of achievement—even in a non-clinical, universal school sample.

Implications for School Psychology and Counselling in Nigeria

The findings have significant implications for educational practice in Port Harcourt and across Rivers State. Currently, guidance and counselling services in Nigerian secondary schools are often understaffed, underfunded, and focused on reactive crisis management or vocational guidance rather than evidence-based psychological intervention (Ogunsanwo & Adewale, 2018) [11]. The success of this 8-week, low-cost, group-based CBT programme demonstrates that structured psychological interventions can be feasibly delivered by trained school counsellors without requiring individual therapy sessions.

Furthermore, the results support a shift away from punitive discipline (e.g., corporal punishment, suspension) toward cognitive-behavioural approaches. Punitive methods may suppress behaviour temporarily but do not teach alternative cognitive and emotional regulation skills (Skiba *et al*., 2014) [13]. CBT, in contrast, equips students with lifelong coping strategies. This aligns with the Rivers State Child Rights Law (2010) [12], which prohibits corporal punishment and calls for positive behaviour support.

Limitations

Several limitations must be acknowledged. First, the quasi-experimental design, while appropriate for school settings, does not provide the same causal certainty as a randomised controlled trial (RCT). Although pretest ANCOVA controls for initial differences, unmeasured

confounders (e.g., home environment, prior mental health history) may have influenced results. Second, the sample was limited to four schools in one urban LGA, which restricts generalisability to rural areas, private schools, or other states in Nigeria. Third, the study measured outcomes immediately after the 8-week intervention; long-term follow-up is needed to assess sustainability and whether booster sessions are required. Fourth, reliance on self-report measures may introduce social desirability bias, though the use of blind assessors and the lack of improvement in the control group mitigate this concern. Fifth, the study did not examine potential differential effects by gender, socio-economic status, or baseline symptom severity, which could be important moderators.

Future Research Directions

Future studies should employ randomised controlled designs with larger, more diverse samples across multiple LGAs and states, including rural and semi-urban areas. Longitudinal follow-up (e.g., 6-month, 12-month post-intervention) would determine whether CBT effects persist and whether periodic booster sessions enhance maintenance. Researchers should also examine moderators (gender, SES, baseline mental health) and mediators (e.g., changes in automatic thoughts, coping self-efficacy) to understand mechanisms more precisely. Cost-effectiveness analyses would assist policymakers in resource allocation. Finally, qualitative studies exploring students' and teachers' experiences of CBT implementation would enrich understanding of contextual facilitators and barriers, including stigma and cultural beliefs about mental health.

Declarations

Conflicts of Interest: The author declares no conflicts of interest.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical Approval: Ethical clearance was obtained from the University of Port Harcourt Research Ethics Committee (Approval No.: UPH/ERC/2025/048). Written informed consent was obtained from school principals, parents/guardians, and student assent was secured.

Data Availability: The datasets generated during this study are available from the corresponding author upon reasonable request.

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Conclusion

This study demonstrates that a structured, 8-week cognitive behavioural therapy-based intervention programme significantly enhances both behavioural adjustment and academic engagement among secondary school students in Port Harcourt LGA, Rivers State. The effects were large in magnitude and statistically robust, even after controlling for pretest differences. These findings challenge the traditional Nigerian reliance on punitive discipline and cognitive-only instruction, underscoring the value of evidence-based psychological interventions in school settings.

For Nigerian educational policy and practice, the implication is clear: CBT-based programmes should no longer be viewed as clinical tools reserved for mental health clinics. Rather, they are practical, cost-effective, and culturally adaptable strategies for fostering the behavioural and emotional competencies that underpin academic success. Integration into school guidance and counselling services, supported by teacher training and policy alignment, is urgently warranted.

Recommendations

Based on the findings, the following recommendations are made:

1. **Integration into Counselling Services:** The Rivers State Ministry of Education should mandate the integration of CBT-based programmes into school guidance and counselling services, with a minimum of one structured session per week for all SS2 students.

2. **Training for Counsellors and Teachers:** The University of Port Harcourt and other teacher training institutions should develop certification workshops in CBT techniques (cognitive restructuring, behavioural activation, relaxation training) for practising school counsellors and interested teachers.

3. **Curriculum Development:** The Nigerian Educational Research and Development Council (NERDC) should develop a standardised, culturally adapted CBT curriculum for secondary schools, including manuals, worksheets, and training materials.

4. **Policy Alignment:** Educational policymakers should align school discipline policies with the Rivers State Child Rights Law (2010) [12] by explicitly endorsing cognitive-behavioural and positive behaviour support approaches over corporal punishment and exclusionary practices.

5. **Further Research:** Government and donor agencies should fund large-scale, longitudinal RCTs to establish national norms for CBT effectiveness across diverse Nigerian regions, school types, and student demographics.

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