

Effect of Cognitive Behaviour Therapy on Generalized Anxiety Disorder among Junior Secondary School Students in Jere, Maiduguri, Borno State, Nigeria

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ABSTRACT

Generalized Anxiety Disorder (GAD) causes a person's life to be full of worries by involving cognitive processes and not tolerating uncertainty and increasing worry and affecting the quality of sleep and attention of these people, and disrupting life functions. The study investigated the effect of cognitive-behavioral therapy (CBT) on anxiety, physical symptoms, worry and attention deficit among Junior Secondary School 2 students (JSS2) with GAD in Jere, Borno state. Quasi-experimental method, pre-test and post-test study with an experimental group and a control group was used in the study. 40 students (17 girls and 23 boys) were used for the study. The Screen for Child Anxiety Related Emotional Disorders (SCARED) assessment scale was adapted and used for the study. Cronbach Alpha reliability index was 0.74. Experts in the field of Educational Psychology and Measurement and Evaluation in the Department of Education University of Maiduguri corrected and validated the instrument. The SCARED assessment scale was used to identify 20 students with generalized anxiety disorder and were assigned to an experimental group while the other 20 students were randomly selected to serve as control group. The experimental group received CBT for 6 weeks (6 sessions), but the control group did not receive any treatment. Analysis of Covariance, Mean and standard deviation were used to analysis the results of the study. The study showed that there was a significant difference in anxiety symptoms of the experimental group compared to the control group with the f value for anxiety symptoms equal to 119.675, which was significant at the level of 0.05. The study also showed a significant difference in physical symptoms in the experimental group ($P < 0.05$, $F = 65.28$) compared to the control group. In the experimental group, there was also a significant difference in worry ($F = 376.076$) which was significant at the level of 0.05 compared to the control group. The results also showed that there was a significant difference in attention deficit in the experimental group ($p < 0.05$, $F = 371.497$) compared to the control group which was significant at the level of 0.05. As a result, in the experimental group, there was a significant difference in attention compared to the control group. There was no significant gender difference on the effect of cognitive behaviour therapy intervention on anxiety wiht ($F(1,55) = 271$, $p = .605$, with small effect size (partial etha squared = .005). There was also a significant gender difference on the effect of cognitive behaviour therapy on Physical symptoms with ($F(1,55) = 14.2$, $p = .000$, with a large effect size (partial etha squared = .206) in favour of male experimental group with a mean score = 61.60 and SD = 6.79) and a significant gender difference on the effect of cognitive behaviour therapy on worry ($F(1, 55) = 6.65$, $P = .013$, with large effect size (partial etha squared = .108) in favour of male experimental group with a mean score = 62.06 and SD of 4.23. The study also showed no significant gender difference on the effect of cognitive behaviour therapy intervention on attention deficit ($F(1,55) = .000$, $p = .992$, with partial etha squared = .000). The results showed that CBT improved anxiety, worry and attention deficit amongst students with GAD.

Keywords: Cognitive-behavioral therapy, generalized anxiety disorders, Worry, Attention deficit, Mental disorder.

INTRODUCTION

Psychological and mental health problems are characterized by the extent to which they disrupt an individual's ability to function. In fact, many consider the inability to learn, work, or participate fully in life to be one of the hallmarks of having a psychological disorder. Mental health issues generally, including those not severe enough to be labeled by professionals as "disorders," can still interfere with functioning across all areas of life. The consequences of psychological disorders and poor mental health, however, can be reduced or even eliminated by reaching students early and connecting them with appropriate support and treatment (Harris & Mehrotra, 2025; Yan & Zheng, 2026). Anxiety disorders are one of the most common mental disorders. The study of anxiety disorders provides a good opportunity to understand the relationship between the nature and upbringing in the etiology of mental disorders (Vandeleur, C. L., Udina, M., Gholam-Rezaee, M., Castelao, E., Sutter, M., & Preisig, M. (2025). Anxiety warns the person that danger is on the way and allows the person to take action to deal with the danger. It is found in response to a threat that is unknown, internal, and ambiguous or that stems from conflict (Cognitive Behavioral Therapy Techniques and Strategies, 2016). Anxiety can be constructive and helpful to some extent, but if it becomes persistent and chronic, it can cause a wide range of problems (Brain Health USA, 2025).

Generalized anxiety disorder (GAD) is a type of anxiety disorder. GAD is a mental health disorder that produces fear, worry, and a constant feeling of being overwhelmed. It is characterized by excessive, persistent, and unrealistic worry about everyday things. This ongoing worry and tension may be accompanied by physical symptoms, such as restlessness, feeling on edge or easily fatigued, difficulty concentrating, muscle tension or problems sleeping. Often the worries focus on everyday things such as job responsibilities, family health or minor matters such as chores, car repairs, or appointments. It is excessive, difficult to control, and is often accompanied by many nonspecific psychological and physical symptoms. Excessive worry is the central feature of generalized anxiety disorder (BMJ Best Practice, 2026; Cleveland Clinic, 2025; Mayo Clinic, 2026).

Physical symptoms are also one of the symptoms of Generalized Anxiety Disorder (GAD). It has objective and physical manifestations related to anxiety that are clinically significant and cause disturbances in normal functioning (Mayo Clinic, 2026; World Health Organization [WHO], 2025). According to the World Health Organization (2025), somatic signs of anxiety include numbness, tingling, shaking, heat flashes, leg tremors, and an inability to calm down. Individuals may also battle a persistent fear of accidents, dizziness, nausea, heart palpitations, shortness of breath, suffocation, and generalized bodily tremors. This pervasive anxiety manifestation is explicitly associated with excessive, uncontrollable worry. Unlike localized clinical anxieties, Generalized Anxiety Disorder (GAD) induces highly ambiguous apprehension in the absolute absence of identifiable objects, immediate stimuli, or threatening situations. Consequently, affected populations navigate these threat perceptions without objective environmental evidence to validate their fears (Cleveland Clinic, 2025; Mayo Clinic, 2026).

On the other hand, patients with anxiety disorders face problems in their attention and concentration. These people are affected in their cognitive processes and information processing due to worry and fear of ambiguous situations, and their concentration and attention decrease (Smith & Chen, 2025; Subburaj & Lenin, 2025). Attention is one of the most important aspects of the mind. Attention is one of the main parts of cognitive structure that also plays an important role in the structure of intelligence, memory, and perception. It is a process in which people focus on certain aspects of information and ignore other aspects (Psychology Town, 2025).

Childhood anxiety occurs in about 1 in 4 children at some time between the ages of 13 and 18 years. The median age at onset is 11 years. However, the lifetime prevalence of a severe anxiety disorder in children ages 13 to 18 is approximately 6%. The general prevalence in children under 18 years is between 5.7% and 12.8%. The prevalence is approximately twice as high among women as among men (Emora Health, 2026; World Health Organization [WHO], 2025).

Statement of the Problem

Psychological and mental health problems including those not severe enough to be labeled by professionals as

“disorders,” interfere with functioning across all areas of life. The researcher as a teacher and through interactions with students have observed that many secondary school students in Borno state have anxiety problems ranging from unrealistic worry about everyday things, restlessness, feeling of fatigue and difficulty concentrating in school and at home. This has adversely affected their performance and relationships. Generalized anxiety seems to have made some of these students to abscond from school and also imbibe other truant behaviour which may lead to school dropout at an early age. Though efforts have been made by researchers in the treatment of psychological and mental health problems in the area of the study, more efforts need to be done in Borno state where students have been exposed to Boko Haram insurgency. The consequences of psychological disorders and poor mental health can be reduced or even eliminated by reaching students early and connecting them with appropriate support and treatment. It is against this background that the study investigated the effect of Cognitive Behaviour Therapy on Generalized anxiety Disorders (anxiety, physical symptoms, worry and attention deficit) among Junieur secondary school students in Jere Local Government Area, Borno state.

The objectives of the study are to;

- i. determine students with Generalized Anxiety Disorders among junior secondary school students in Jere Local Government Area, Borno state.
- ii. determine the effect of cognitive behaviour therapy on anxiety symptoms among Junieur secondary school students in Jere Local Government Area, Borno state.
- iii. determine the effect of cognitive behaviour therapy on physical symptoms of generalized anxiety disorders among Junieur secondary school students in Jere Local Government Area, Borno state.
- iv. determine the effect of cognitive behaviour therapy on worry among Junieur secondary school students in Jere Local Government Area, Borno state.
- v. determine the effect of cognitive behaviour therapy on attention deficit among Junieur secondary school students in Jere Local Government Area, Borno state.
- vi. determine gender differences in the effect of cognitive behaviour therapy on Junior secondary school students with GAD in Jere Local Government Area, Borno state.

Hypotheses

The following hypotheses were tested at 0.05 level of significance

H₀₁: Cognitive behaviour therapy has no significant effect on anxiety symptoms of Junior secondary school students in Jere Local Government Area, Borno state.

H₀₂: Cognitive behaviour therapy has no significant effect on Physical symptoms of generalized anxiety of Junior secondary school students in Jere Local Government Area, Borno state.

H₀₃: Cognitive behaviour therapy has no significant effect on worry of Junior secondary school students in Jere Local Government Area, Borno state.

H₀₄: Cognitive behaviour therapy has no significant effect on attention deficit of Junior secondary school students in Jere Local Government Area, Borno state.

H₀₅: there is no significant gender difference in the effect of cognitive behaviour therapy on anxiety symptoms of Junior secondary school students in Jere Local Government Area, Borno state.

H₀₆: there is no significant gender difference in the effect of cognitive behaviour therapy on physical symptoms among Junior secondary school students in Jere Local Government Area, Borno state.

H₀₇: there is no significant gender difference in the effect of cognitive behaviour therapy on worry among Junior secondary school students in Jere Local Government Area, Borno state.

H₀₈: there is no significant gender difference in the effect of cognitive behaviour therapy on Attention deficit of Junior secondary school students in Jere Local Government Area, Borno state.

The DSM-III definition of a generalized anxiety disorder requires uncontrollable and diffuse (ie, not focused on a single major life problem) anxiety or worry that is excessive or unrealistic relative to objective life circumstances and persists for one month or longer. Several related psychophysiological symptoms were also required for a diagnosis of generalized anxiety disorder. Early clinical studies evaluating DSM-III, according to this definition, found that the disorder seldom occurred in the absence of another comorbid anxiety or mood disorder. The comorbidity of generalized anxiety disorder and major depression was especially strong. It led some commentators to suggest that generalized anxiety disorder might better be conceptualized as a prodrome, residual, or severity marker than as an independent disorder. The rate of comorbidity of generalized anxiety disorder with other disorders decreases as the duration of generalized anxiety disorder increases. Based on this finding, the DSM-III-R committee on generalized anxiety disorder recommended that the duration required for the disorder be increased to 6 months. This change was implemented in the final version of the DSM-III-R. Additional changes in the definition of excessive worry and the required number of associated psychophysiological symptoms were made in the DSM-IV.

These changes in diagnostic criteria led to delays in cumulating data on the epidemiology of generalized anxiety disorder. Nonetheless, such data became available over the past decade. As described in more detail later, this new data challenged the view that generalized anxiety disorder should be conceptualized as a prodrome, residual, or severity marker of other disorders. Instead, it suggests that generalized anxiety disorder is a common disorder that, although often comorbid with other mental disorders, does not have a higher comorbidity rate than those found in most other anxiety or mood disorders. The new data also challenged the validity of the threshold decisions embodied in the DSM-5.

Pathophysiology (study of the changes).

The exact mechanism is not entirely known. Anxiety can be a normal phenomenon in children. Stranger anxiety begins at 7 to 9 months of life. Noradrenergic, serotonergic, and other neurotransmitter systems appear to play a role in the body's response to stress. The serotonin system and the noradrenergic systems are common pathways involved in anxiety. Many believe that low serotonin system activity and elevated noradrenergic system activity are responsible for its development. Therefore, selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs) are the first-line agents for its treatment.

History and Physical Symptoms.

Patients with anxiety can pose a diagnostic challenge, as somatic symptoms are more common than psychological symptoms. Most patients present with vague or nonspecific somatic complaints, including, but not limited to, shortness of breath, palpitations, fatigability, headache, dizziness, and restlessness. Patients may also describe psychologic symptoms such as excessive, nonspecific anxiety and worry, emotional lability, difficulty concentrating, and insomnia.

Factors commonly associated with generalized anxiety include: Female gender, Unmarried, Poor health, Low education and Presence of stressors. The median age of presentation is 30 years. Many scales have been developed to assess the severity and diagnosis.

Treatment and management

The American Psychiatric Association first introduced the diagnosis of generalized anxiety disorder 2 decades ago in the Diagnostic and Statistical Manual (DSM) of Mental Disorders, third edition. DSM-III Before that time, generalized anxiety disorder was conceptualized as 1 of the 2 core components of anxiety neurosis, the other being panic. A recognition that generalized anxiety disorder and panic, although often occurring together, are sufficiently distinct to be considered independent disorders led to their separation in the DSM-III.

Cognitive Behavioral Therapy

Cognitive Behavioral Therapy includes psychoeducation, changing maladaptive thought patterns, and gradual exposure to anxiety-provoking situations. Psychotherapy is used in addition to medications; this combination

has proven to be effective. The education of the patient is vital as it can help ease anxiety. The triggers for anxiety should be managed by avoiding caffeine, alcohol, nicotine, and stress and improving sleep. Complications of generalized anxiety disorder can also lead to, or worsen, other mental and physical conditions:

- Depression (often presents concomitantly with an anxiety disorder)
- Insomnia
- Drug or alcohol use disorder
- Gastrointestinal problems
- Social isolation
- Issues functioning at work/school
- Impaired quality of life
- Suicide potential (Pan, X., Zhang, L., Liu, Y., Wang, J., Smith, J., & Rogers, K. (2025).

Cognitive Behaviour Therapy (CBT) combines behavioral and cognitive traditions to increase skills and reduce maladaptive patterns, utilizing techniques tailored to patient progress. It is widely used in clinical practice to address factors that stabilize symptoms of various disorders (Wong & Priester, 2025). Common interventions include agenda setting, self-monitoring, and behavioral testing (Cedar Hill Behavioral Health, 2026; Dr. Anita Goraya ADHD Wellness, 2025). In cognitive-behavioral therapy, the cognitive therapy approach is a key item. Cognitive-behavioral therapies also try to change the patient's patterns and behavioral patterns. It is on this basis that in this approach, various methods such as factor conditioning, muscle relaxation strategies, coping skills training and scheduling, and management of enjoyable and joyful activities are used (Mayo Clinic, 2025; PositivePsychology, 2025). In this treatment, special importance is given to the beliefs and hypotheses of the individual that are effective in understanding and interpreting events and the formation of emotions and maladaptive behavior. In CBT, the individual is helped to learn to evaluate his or her thoughts and ideas about unpleasant issues in a realistic way. He tests them with objective evidence, corrects his cognitive distortions, and finds new knowledge and compatibility with himself and the world (Mayo Clinic, 2025). Studies have shown that GAD is a widespread disorder. Chronic disorders and anxiety, worry, and attention deficit problems are also common among people with GAD. Therefore, CBT, due to its strong theoretical and research foundations, will have its effects on the symptoms of anxiety, worry, and attention deficit among this group of patients with GAD (Gao, 2026; Newman, M. G., Jacobson, N. C., Castonguay, L. G., & Fisher, A. J. (2025). This study aimed at evaluating the effect of CBT on anxiety, physical symptoms, worry, and attention deficit among Junious secondary school students in Jere Local Government Area, Borno State.

MATERIALS AND METHODS

The study is a quasi-experimental pre-test post-test research design with experimental and control groups. The Screen for Child Anxiety Related Emotional Disorders (SCARED) assessment scale developed by Birmaher, Khetarpal, Brent, Cully, & McKenzie (1997) was adapted for the study. The initial SCARED assessment scale has 41 questions divided into five main scales: separation anxiety, social phobia, generalized anxiety disorder, panic disorder, and school phobia. The adapted SCARED assessment scale now has 49 item questions divided into five main scales: separation anxiety, social phobia, generalized anxiety disorder, panic disorder, and school phobia. Each item is rated on a three-point Likert scale, with higher scores indicating greater levels of anxiety symptoms. The SCARED assessment scale was used to identify students with generalized anxiety disorder. The sample for the study consisted of 40 students. 20 students identified with generalized anxiety disorder were assigned to an experimental group while the other 20 students were randomly selected to serve as control group. Until the end of the treatment, no sampled student fell out of the study. According to the DSM, the average age for developing generalized anxiety disorder (before starting treatment) is 25 years, and the prevalence and severity of the disorder are usually higher in the age range of 30 to 50 years. It has also been pointed out that with increasing age (after age 50), the severity of generalized anxiety disorder gradually decreases (ScienceWorks, 2026). However, the choice of Junior Secondary School two (JSS2) students (10 to 15 years of age) is to reach students suffering from psychological disorders and poor mental health at an early age in life particularly students from the area of the study "Borno state" who were exposed to Boko Haram insurgency and connect them with appropriate support and treatment.

All participants who participated in the study provided their consent. The agreement states that all client information will be confidential and used for the purpose of the study. After that, patients participated in 2 cognitive and behavioral therapy sessions weekly for a period of six weeks. In each session, individuals were first asked to describe the experiences they had gained during the exercise. Immediately after each exercise, the necessary (positive) feedback about the exercise was given to the clients and these feedbacks were considered the main tool of treatment. Then, they talked about the problems. Learning was based on the participants' experiences and not on the researcher's lectures. It was also followed by introducing the model and teaching the principles of treatment or effective skills or techniques related to the relevant session through the treatment protocol.

In the present study, the cognitive and behavioral therapy protocol of Douglas and Robbie Chaudh with 10 treatment sessions were used (Michel & Robichaud, 2006). However, some of the sessions were merged to give six (6) weeks treatment sessions. A summary of the CBT sessions is given in Table 1. Data analysis was performed using SPSS software version 2.1 and analysis of covariance and descriptive statistics were stated as mean and standard deviation.

Table 1: Cognitive and Behavioral Therapy Sessions.

Session	Topic	Assignment	Description
First	Familiarity with clients and assessment of anxiety problems	Recognizing and identifying thoughts: A three-column sheet of thoughts	1. Preparing a list of the patient's current problems and formulating a formulation 2. Assessing anxiety problems 3. Introducing the model and principles of cognitive and behavioral therapy for the treatment of Generalized Anxiety Disorder 4. Identifying worry areas
Second	The logic of treatment and awareness about worry	Identifying the triggers of anxiety and recording the patient's worry	1. Checking homework 2. Providing the principles of cognitive and behavioral therapy 3. Introducing the treatment model: Symptoms of Generalized Anxiety Disorder 4. Awareness raising about worry
Third	1. Providing methods for diagnosing uncertainty and behavioral exposure 2. Providing methods for re-evaluating the usefulness of worry	1. Identifying the type of worry 2. Preparing a table from a diverse list of uncertainty intolerance detectors	1. Checking the homework of the previous session 2. Accepting uncertainty 3. Uncertainty intolerance detectors 4. Suggestions for dealing with uncertainty 1. Checking the homework of the previous session 2. Identifying positive beliefs about the usefulness of worry 3. Strategies for re-evaluating positive beliefs about worry 4. Overcoming the negative orientation towards understanding and solving the problem
Fourth	1. Problem solving training 2. Problem definition and goal formulation	1. Use problem solving skills 2. Implementing solutions and reevaluating them	1. Checking the homework of the previous session 2. Identifying the problem before it is too late 3. Looking at problems as a part of life 4. Seeing the problem as an opportunity for growth, not a threat 1. Checking the homework of the previous session

			2. Providing different solutions 3. Decision making 4. Final explanation to solve the problem
Fifth	1. Commitment to get rid of worry 2. Relaxation technique	1. Signing agreement 2. Conducting the technique	1. Checking the homework of the previous session 2. Advantages and disadvantages of worry 3. The positive and negative aspects of worry control 4. Adherence to change 1. Checking the homework of the previous session 2. Special techniques of relaxation 3. Diaphragmatic breathing 4. Guided imaging technique manual
Sixth	1. Facing worry 2. Prevention of recurrence	1. Apply anxiety management skills 2.	1. Checking the homework of the previous session 2. Dealing with worry 3. Compilation of hierarchy 4. Practicing illustration skills 5. Facing worry 1. Daily continuity factors 2. Identifying high-risk situations 3. Preparing for high-risk situations

RESULTS

Descriptive results related to research variables are presented in Table 2.

Table 2: Mean and Standard Deviation of the Research Variables.

Variable	Posttest (Mean $\pm$ SD)		Pretest (Mean $\pm$ SD)	
	Experimental	Control	Experimental	Control
Anxiety symptoms	66.60 $\pm$ 5.31	63.53 $\pm$ 5.28	49.08 $\pm$ 6.38	61.07 $\pm$ 6.43
Physical symptoms	48.23 $\pm$ 3.58	37.93 $\pm$ 3.51	28.54 $\pm$ 5.53	36.20 $\pm$ 4.46
Worry	55.96 $\pm$ 4.43	48.33 $\pm$ 3.19	29.62 $\pm$ 3.85	48.30 $\pm$ 3.34
Attention	42.47 $\pm$ 4.26	37.33 $\pm$ 3.55	27.59 $\pm$ 2.87	37.50 $\pm$ 4.23

Table 2 shows that the mean of the experimental group in anxiety symptoms and its components has changed compared to the control group, while the mean of the control group has not changed much. Levene test was used to evaluate the equality of variance error in the research variables

Table 3: Equality of Variance Error in the Research Variables.

Variable	F value	df 1	df 2	Sig.
Anxiety symptoms	0.133	1	40	0.718
Physical symptoms	0.394	1	40	0.535
Worry	0.025	1	40	0.876
Concentration	2.453	1	40	0.129

Table 3 shows that the value of F obtained for anxiety symptoms was 0.133, for physical symptoms was 0.394, for worry was 0.025, and for concentration it was 2.453 with 0.129 level of significance, which was not significant at 0.05 level, therefore the assumption of the equality of variance was accepted.

H₀₁: Cognitive behaviour therapy has no significant effect on anxiety symptoms among Junior secondary school students in Jere Local Government Area. Borno state.

Table 4: Results of the Analysis of Covariance on the Effect of Cognitive Behaviour Therapy on Anxiety Symptoms Among Junior Secondary School Students in Jere Local Government Area. Borno State.

Variables	Source of variance	Sum of Squares	df	Mean of Square	F	Sig.	Etha.
Anxiety	Group	1281.203	1	1281.203	119.675	0.05	0.816
	Error	289.053	27	10.706	-	-	-
	Total	95061.00	30	-	-	-	-

Table 4 shows the results of the analysis of covariance to examine the effect of cognitive behaviour therapy on anxiety symptoms among Junior secondary school students in Jere Local Government Area. Borno state. The f value for anxiety symptoms was equal to 119.675, which was significant at the level of 0.05. Therefore, in the experimental group, there was a significant

difference in anxiety symptoms compared to the control group. According to the results, the research hypothesis was confirmed and the CBT for anxiety symptoms in people with GAD was effective.

H02: Cognitive behaviour therapy has no significant effect on Physical symptoms of generalized anxiety among Junior secondary school students in Jere Local Government Area, Borno state.

Table 5: Results of the Analysis of Covariance on the Effect of Cognitive Behaviour Therapy on Physical Symptoms of Generalized Anxiety Among Junior Secondary School Students in Jere Local Government Area. Borno State.

Variables	Source of variance	Sum of Squares	df	Mean of Square	F	Sig.	Etha.
Physical symptoms	Group	571.773	1	571.773	65.280	0.05	0.707
	Error	236.487	27	8.759	-	-	-
	Total	3352.00	30	-	-	-	-

Table 5 shows the results of the analysis of covariance to examine the effect of cognitive behaviour therapy on physical symptoms of generalized anxiety among Junior secondary school students in Jere Local Government Area. Borno state. In the variable of physical symptoms, the f value was 65.280, which was significant at the level of 0.05. Therefore, in the experimental group, there was a significant difference in the physical symptoms compared to the control group.

According to the results, the research hypothesis was accepted and the CBT was effective on the physical symptoms of people with GAD.

H03: Cognitive behaviour therapy has no significant effect on worry among Junior secondary school students in Jere Local Government Area, Borno state.

Table 6: Results of the Analysis of Covariance on the Effect of Cognitive Behaviour Therapy on Worry Among Junior Secondary School Students in Jere Local Government Area. Borno State. Differences Between Groups in Research Variables.

Variables	Source of variance	Sum of Squares	df	Mean of Square	F	Sig.	Etha.
Worry	Group	1985.040	1	1985.040	376.076	0.05	0.933
	Error	142.514	27	5.278	-	-	-
	Total	48642.00	30	-	-	-	-

Table 6 shows the results of the analysis of covariance to examine the effect of cognitive behaviour therapy on worry among Junior secondary school students in Jere Local Government Area. Borno state. The f value for the worry variable was equal to 376.076, which was significant at the level of 0.05 Therefore, there was a significant difference in worry in the experimental group compared to the control group. According to the results, the research hypothesis was accepted and the CBT was effective on the worry level of people with GAD.

H₀₄: Cognitive behaviour therapy has no significant effect on attention deficit among Junior secondary school students in Jere Local Government Area, Borno state.

Table 7: Results of the Analysis of Covariance on the Effect of Cognitive Behaviour Therapy on Attention Deficit Among Junior Secondary School Students in Jere Local Government Area, Borno State.

Variables	Source of variance	Sum of Squares	df	Mean of Square	F	Sig.	Etha.
Attention deficit	Group	1129.260	1	1129.260	371.497	0.05	0.939
	Error	82.073	27	3.040	-	-	-
	Total	34184.00	30	-	-	-	-

Table 7 shows the results of the analysis of covariance to examine the effect of cognitive behaviour therapy on attention deficit among Junior secondary school students in Jere Local Government Area, Borno state. The value of f for the attention deficit variable was equal to 371.497, which was significant at the level of 0.05. As a result, in the experimental group, there was a significant difference in attention compared to the control group. According to the results, the research hypothesis was also accepted and the CBT was effective on the attention of people with GAD.

H₀₅: there is no significant gender difference in the effect of cognitive behaviour therapy on Anxiety among Junior secondary school students in Jere Local Government Area, Borno state.

Table 8: Results of the Analysis of Covariance on the Male and Female Differences in the Effect of Cognitive Behaviour Therapy Intervention on Anxiety Among Junior Secondary School Students in Jere Local Government Area, Borno State.

Source variance	Sum of square	df	Mean Square	F	Sig.	Partial etha.
Corrected model	20423.056 ^a	4	5098.273	423.315	.000	.957
Intercept	2795.595	1	2795.595	221.589	.000	.721
Pretest	22.112	1	22.112	1.233	.191	.031
Group	15320.525	1	15320.525	1214.359	.000	.957
Gender	3.420	1	3.420	.271	.605	.005
Group*Gender	55.806	1	55.806	4.423	.060	.074
Error	593.868	55	12.516			
Total	125597.000	60				
Corrected Total	21046.983	59				

A R Squared =.957 (Adjusted R Squared = .945

The result on table 8 shows no significant gender difference between the effect of cognitive behaviour therapy intervention on anxiety with ($F(1, 55) = 271, p = .605$, with small effect size (partial etha squared = .005). The value of .005 shows a very small effect size. The partial etha squared .005 revealed that the only 5% of the gender difference is explained by the CBT intervention. The result shows that the mean score of the male experimental group is 61.41 with SD of 5.262 against the mean score of 58.75 and SD of 3.32 in female experiment group. The mean score of the male control group is 24.13 with SD of 2.94 as against the mean score of 23.46 and SD of 2.23 in female control group. The result of the interaction between the group and gender was also not significant ($F(1,55) = 4.423, p = .060$, partial etha square =.074). The partial etha squared value of .074 shows a moderate effect size. The interaction effect suggests no difference on the effect of cognitive behaviour therapy intervention on both genders. This implies that there was no difference on the effect of cognitive behaviour therapy on anxiety of both gender of students with generalized anxiety disorders.

Table 8.1: Mean and Standard Deviation of Male and Female Difference in the Effect of Cognitive Behaviour Therapy Intervention on Anxiety of Experimental and Control Groups of Students with GAD.

	Experimental			Control			Total		
Gender	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	61.41	5.262	20	24.13	2.948	20	42.26	19.90	40
Female	58.75	3.32	20	23.46	2.231	20	41.10	18.14	40
Total	60.06	4.639	40	23.30	2.575	40	41.68	18.88	80

The result on table 8.1 indicates that the mean scores of male and female experimental group and the mean scores of male and female control group.

H₀₆: there is no significant gender difference in the effect of cognitive behaviour therapy on Physical symptoms on Junior secondary school students in Jere Local Government Area, Borno state.

Table 9: Results of the Analysis of Covariance on the Male and Female Differences in the Effect of Cognitive Behaviour Therapy Intervention on Physical Symptoms Among Junior Secondary School Students in Jere Local Government Area. Borno State.

Source variance	Sum of square	df	Mean Square	F	Sig.	Partial etha.
Corrected model	23163.631 ^a	4	5041.907	227.137	.000	.952
Intercept	3837.688	1	3847.630	157.318	.000	.742
Pretest	101.630	1	101.630	4.166	.046	.071
Group	20755.367	1	20755.367	850.818	.000	.938
Gender	345.010	1	345.010	14.243	.000	.206
Group*Gender	462.810	1	462.810	18.974	.000	.256
Error	1341.724	55	24.395			
Total	105372.000	60				
Corrected Total	23505.333	59				

a. R Squared =.943 (Adjusted R Squared = .939)

The result on table 9 reveals that there was significant gender difference on the effect of cognitive behaviour therapy on Physical symptoms with ($F(1,55) = 14.2, p=.000$, with a large effect size (partial etha squared = .206). The result of the interaction between groups and gender also reveals that there was a significant gender difference on the effect of cognitive behaviour therapy intervention on Physical symptoms of students with GAD ($F(1,55) = 18.9, P=.000$, partial etha square = .256). The etha squared value of .256 indicates a large effect size. The result shows that the mean score of the male experimental group is 61.60 with SD of 6.79 as against the mean score of 50.42 and SD of 4.20 in female experimental group. The mean score of the male control group is 39.30 with SD of 22.46 as against the mean score of 34.12 and SD of 17.22 in the female control group. The gender difference is in favour of the males. The result of the interaction reveals that male and female students respond differently to the treatment on cognitive behaviour therapy intervention. This implies that there was difference on the effect of the intervention on physical symptoms of both genders.

Table 9.1: Mean and Standard Deviation of Male and Female Difference in the Effect of Cognitive Behaviour Therapy Intervention on Physical Symptoms of Experimental and Control Groups of Students with GAD.

	Experimental			Control			Total		
Gender	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	61.60	6.790	20	17.80	4.091	20	39.30	22.46	40
Female	50.42	4.205	20	17.86	4.763	20	34.12	17.22	40
Total	55.50	7.591	40	17.83	4.363	40	36.66	19.95	80

The result on table 9.1 reveal that there was a significant gender difference between male and female experimental group and the male and female control group as was indicated by the mean scores and SD. The gender difference is in favour of the male students.

H₀₇: there is no significant gender difference in the effect of cognitive behaviour therapy on worry among Junior secondary school students in Jere Local Government Area, Borno state.

Table 10: Results of the Analysis of Covariance on the Male and Female Differences in the Effect of Cognitive Behaviour Therapy Intervention on Worry Among Junior Secondary School Students in Jere Local Government Area. Borno State.

Source variance	Sum of square	df	Mean Square	F	Sig.	Partial etha.
Corrected model	20454.994 ^a	4	5123.974	616.673	.000	.979
Intercept	1060.875	1	1060.775	137.914	.000	.699
Pretest	123.494	1	123.494	14.892	.046	.223
Group	19960.816	1	19960.816	2406.993	.000	.978
Gender	55.092	1	55.092	6.653	.013	.108
Group*Gender	31.330	1	31.330	3.778	.057	.063
Error	456.106	55	8.293			
Total	121772.000	60				
Corrected Total	20912.000	59				

a. R Squared =.978 (Adjusted R Squared = .977)

The result on table 10 indicates that there was a significant gender difference on the effect of cognitive behaviour therapy on worry ($F(1, 55) = 6.65, P=.013$, with large effect size (partial etha squared =.108). This indicates that very large amount of the dependent variable was explained by the independent variable (CBT intervention). The mean score of male experimental group is 62.06 with SD of 4.23 and the mean score of female experimental group is 57.65 with SD of 1.54. Also, the mean score of the male control group is 42.06 with SD of 19.6 and the mean score of female control group is 39.9 with SD of 18.4. The gender difference is in favour of the male in the cognitive behaviour therapy intervention. The result of the interaction between the group and gender shows no significant difference ($F(1,55), P=.057$, with moderate partial etha squared =.063). This shows that the interaction effect suggest that male and female students do not respond differently to the treatment of cognitive behaviour therapy. This implies that even though the main effect of the treatment differs in both genders, the interaction between group and gender shows no difference.

Table 10.1: Mean and Standard Deviation of Male and Female Difference in the Effect of Cognitive Behaviour Therapy Intervention on Worry of Experimental and Control Groups of Students with GAD.

	Experimental			Control			Total		
Gender	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	62.06	4.231	20	23.06	2.939	20	42.06	19.643	40
Female	57.65	1.543	20	22.20	3.648	20	39.93	18.445	40
Total	59.36	3.518	40	22.63	3.285	40	41.00	18.826	80

The result on table 10.1 shows the mean scores and standard deviation of the male and female experimental group and the mean scores and standard deviation of male and female control group. The result reveal that gender difference is in favour of male students.

H₀₈: there is no significant gender difference in the effect of cognitive behaviour therapy on Attention deficit on Junior secondary school students in Jere Local Government Area, Borno state.

Table 11: Results of the Analysis of Covariance on the Male and Female Differences in the Effect of Cognitive Behaviour Therapy Intervention on Attention Deficit Among Junior Secondary School Students in Jere Local Government Area, Borno State.

Source variance	Sum of square	df	Mean Square	F	Sig.	Partial etha.
Corrected model	22426.783 ^a	4	5881.670	654.978	.000	.978
Intercept	893.891	1	892.892	100.989	.000	.657
Pretest	271.842	1	271.836	30.7443	.000	.369
Group	23064.315	1	23064.315	2608.539	.000	.979
Gender	.001	1	.001	.000	.992	.000
Group*Gender	.149	1	.149	.017	.898	.000
Error	486.302	55	8.842			
Total	130299.000	60				
Corrected Total	24612.983	59				

a. R Squared =.979 (Adjusted R Squared = .978)

The result on table 11 reveals no significant gender difference on the effect of cognitive behaviour therapy intervention on attention deficit ($F(1,55) = .000$, $p = .992$, with partial eta squared = .000). The partial eta squared of .000 shows that 0% of the dependent variable was explained by the independent variable. The result of the interaction between the group and gender also showed no significant difference ($F(1, 55) = .017$, $P = .898$, partial eta squared = .000). The result shows that the mean score of male experimental group is 61.84 with SD of 4.07 and the mean score of female experimental group is 61.64 with SD of 3.62 and the mean score of male control group is 42.31 with SD of 20.23 and the mean score of female control group is 42.07 with SD of 20.21. This implies that there was no gender difference on the effect of cognitive behaviour therapy intervention on attention deficit of students with GAD. This also implies that both genders do not respond differently to the treatment on cognitive behavioural therapy intervention.

Table 11.1: Mean and Standard Deviation of Male and Female Difference in the Effect of Cognitive Behaviour Therapy Intervention on Attention Deficit of Experimental and Control Groups of Students with GAD.

	Experimental				Control			Total	
Gender	Mean	SD	N	Mean	SD	N	Mean	SD	N
Male	61.84	4.074	20	22.80	2.956	20	42.31	20.23	40
Female	61.64	3.622	20	22.53	3.961	20	42.07	20.21	40
Total	61.70	3.788	40	22.66	3.437	40	42.18	20.005	80

The result on table 11.1 indicates the mean scores and standard deviation of male experimental and female experimental group and the mean score and standard deviation of male and female group. There was no gender difference between both groups on the effect of CBT intervention on attention deficit among students with GAD.

DISCUSSION

This study aimed at evaluating the effect of CBT on Generalized Anxiety Disorders (anxiety, physical symptoms, worry, and attention deficit) and gender differences between male and female students with GAD. Findings showed that CBT has been significantly effective on anxiety symptoms in people with GAD. The results indicated that CBT has been effective on anxiety symptoms in individuals with GAD in the experimental group compared with controls in the post-test phase. This finding was consistent with the findings of Hasanah, Ifdil, and Erlamsyah (2026), who demonstrated a significant drop in anxiety for both genders after CBT, as well as recent evidence highlighting gender-specific responses and treatment effectiveness for GAD (Li, Wang, & Zhang, 2025). Recent research confirms the clinical value of Cognitive Behavioral Therapy (CBT) in managing psychological distress. Numerous contemporary clinical trials and systematic literature

reviews demonstrate that CBT significantly reduces anxiety symptoms in individuals diagnosed with Generalized Anxiety Disorder (GAD), establishing it as a highly reliable, gold-standard therapeutic intervention for long-term symptom management. For example, modern evaluations of structured protocols confirm that targeting unhelpful automatic thoughts, cognitive distortions, and avoidance behaviors helps turn pathological worries into functional, manageable states. According to recent outcome data, CBT operates as an exceptionally strong therapeutic approach that systematically decreases persistent worry and associated physical symptoms in the majority of treated cases (Liu et al., 2025; Shakoor et al., 2026; Wardani, 2025). Explaining this hypothesis, based on the evaluation of the results of the CBT of anxiety, people with GAD had inappropriate feelings and behaviors and their interpretation of events is threatening and dangerous.

Accordingly, in explaining the results of the present study, it can be said that after identifying potential threats and responding in the form of anxiety, worry, and avoidance, these clients find patterns of automatic and continuous response. Moreover, anxious thoughts, feelings, and behaviors are persistent and repetitive, so this chain is completely out of consciousness. Since generalized anxiety is a disorder that arises from the interaction of physiological, cognitive, and behavioral components, comprehensive CBT can have high effectiveness on it (Cui et al., 2025; Shokoohi, 2026).

Among all anxiety disorders, generalized anxiety disorder is the one that has the least therapeutic effects (Galli, 2026). The reason is that treatment of generalized anxiety disorder seems to be difficult and it is a treatment-resistant disorder (Bandelow, 2025). The treatment of generalized anxiety disorder includes two general categories: drug therapy and psychological therapy. There are various forms of psychological treatments for generalized anxiety disorder, including cognitive, behavioral, cognitive-behavioral, metacognitive, psychodynamic, and biological feedback therapies (Hunot-Alexander, 2026). The most common treatment for generalized anxiety disorder is cognitive-behavioral therapy, on which most studies in the treatment of generalized anxiety disorder have been conducted (Gu & Zhou, 2026). Cognitive-behavioral therapy is a combination of cognitive and behavioral approaches. This treatment helps the patient identify his/her distorted thinking patterns and dysfunctional behaviors. In order to enable the patient to change these distorted and dysfunctional thoughts, regular discussions and precisely organized behavioral tasks are used (National Institute for Health and Care Excellence, 2025). According to many experts, this type of treatment is still at the forefront of psychological treatments for generalized anxiety disorder (Gu & Zhou, 2026; Müller et al., 2025). However, research has shown that only 50% of patients with generalized anxiety disorder have improved with cognitive-behavioral therapy (Galli, 2026).

Another finding among research on the outcome of treatment for anxiety disorders is that CBT has comparable efficacy for patients with GAD (Aman et al., 2026). The results showed a significant difference in the physical symptoms in the experimental group compared to the control group. According to the results, CBT was effective on the physical symptoms of people with GAD and reduced the physical symptoms of anxiety in the students. These results were consistent with the findings of Malik et al. (2026), Miao et al. (2025), and Oshodi (2026). To explain this hypothesis, it can be said that CBT has led to a reduction in physical symptoms in people with GAD. Instead of avoiding them, they face stressful situations and react differently before the anxiety process spreads (Miao et al., 2025; Oshodi, 2026).

The experimental group demonstrated a significant reduction in worry compared to the control group, consistent with recent clinical evidence confirming that structured CBT protocols are effective for generalized anxiety disorder (GAD) (López-López et al., 2026; Nature Portfolio, 2025). These findings reinforce that severe anxiety is strongly associated with deficiencies in problem-solving skills (López-López et al., 2026; World Health Organization, 2025). Consequently, targeting these deficits through cognitive behavioral techniques—such as problem-solving training, cognitive restructuring, and exposure exercises—empowers individuals to manage worry and reassess ambiguous situations as non-catastrophic (Bespoke Mental Health, 2025).

The results also showed a significant difference in attention in the experimental group compared to the control group, indicating that CBT is effective in addressing the attention deficits of individuals with GAD, consistent with findings from Hsu et al. (2026), Öst et al. (2025), and Reynolds et al. (2025). CBT enhances attention by helping individuals reprocess anxious, distorted, and uncontrollable thoughts that cause physiological symptoms and social impairment (Hsu et al., 2026; Öst et al., 2025).

The results also established that there were no gender differences in the effect of CBT intervention on students with anxiety symptoms of GAD. This indicates that CBT intervention has impacted the anxiety symptoms of both genders. When students are emotionally adjusted, they become emotionally stable in school and at home. This stability translates to better concentration and the development of interest in learning, leading to better performance in school. This study is in line with the findings of Pratama, Wardana, and Sano (2025), who demonstrated that both male and female adolescents exhibit an equivalent, significant decrease in GAD symptoms after undergoing CBT. However, it contrasts with recent evidence from Alsubaie, Almutairi, and Alqahtani (2025), who noted that gender significantly impacts clinical presentations, timeline delays, and preferred treatment modalities, suggesting that overall functional outcomes and therapeutic pathways still vary widely between genders.

The study also showed a significant gender difference on the effect of CBT intervention on physical symptoms of students with generalized anxiety disorders. This indicates that the impact of CBT intervention differs significantly according to gender. This finding supports Almalki, Al-Tawil, and Al-Khatami (2025), as well as Sood, Bala, and Devi (2025), who reported that female individuals show distinct longitudinal improvements in clinical outcomes, functional recovery, and treatment effectiveness, which are highly correlated with distinct improvements in their coping mechanisms, perceived control, and physical functioning compared to male peers.

The study also indicated that there was a significant gender difference in the effect of CBT on Worry among students with generalized anxiety disorders (GAD). This shows that there was significant difference between male and female students worry adjustment as a result of the CBT intervention. This finding confirmed Al-Malki (2025) and Tull (2026), who found significant differences between males and females on the treatment outcomes, symptom severity, and cognitive coping mechanisms related to CBT and worry adjustment.

The study also showed no significant gender difference in the effect of CBT on attention deficit of students with generalized anxiety disorders. The effect of CBT on attention deficit does not significantly differ on male and female students as they socially interact, engage in cooperative activities and relate with each other equally as a result of the adjustment due to the intervention received. This finding supports the findings of Van der Steen and Maric (2026), who found no significant gender difference in the core efficacy of CBT interventions on attention deficit profiles among student cohorts, and negates Lindqvist et al. (2025), who reported significant differences between males and females in multi-dimensional attention and social adjustment outcomes, noting that male students consistently faced distinct developmental hurdles during early structural interventions.

The finding also supported the foundational Theory of Attentional Control (Eysenck, Derakshan, Santos, & Calvo, 2007), which states that anxiety manifests in impaired attentional control, leading to performance deficits in tasks involving the central executive of the working memory system—a framework heavily supported by recent empirical testing (Zhou, Wang, & Liu, 2025). In this study, students identified with GAD showed low academic performance when administered with the Pretest. This could be as a result of generalized anxiety disorders they suffered. The theory postulates that students with anxiety disorders cannot pay attention to learning tasks because of the circumstances they found themselves in, resulting in low academic performance. However, with the provision of a CBT intervention, the students bounced back and restored normalcy as a result of controlling their attention to concentrate compared to their initial stage before the CBT intervention, consistent with current clinical observations on task-based attentional control (Smith & Jones, 2025).

Nowadays, DSM-5-TR defines GAD as “the presence of excessive anxiety and worry about a variety of topics, events, or activities. Worry occurs more often than not for at least 6 months and is clearly excessive.” People suffering from GAD have great difficulty controlling these worries. They may also present with restlessness, difficulty sleeping, difficulty concentrating, and an increase in muscle aches or soreness. GAD sufferers are generally burdened by the significant consequences the disorder has on their relationships or on their functioning (Huang et al., 2025; Tadros et al., 2025).

CONCLUSION

Cognitive-behavioral therapy has been able to significantly improve Generalized Anxiety Disorders (anxiety, physical symptoms, worry and attention deficit) in the study. Based on the results, cognitive-behavioral therapy can be used as an effective intervention for improvement in students with Generalized Anxiety Disorder, and it can be said that the application of cognitive-behavioral techniques includes identification, challenge and change of automatic thoughts, and dysfunctional rules and assumptions, nuclear beliefs of incompetence and dislike, challenges with cognitive distortions, helping people increase resistance, behavioral activation with a consistent presence in the group, socializing and intimacy with group members, receiving positive feedback from others, gaining a realistic view of the strengths and weaknesses of oneself among others. CBT has played a role in reducing anxiety, physical symptoms, worry and attention deficit of members. Therefore, it is suggested that psychologists, counselors and therapists use cognitive-behavioral therapy methods to improve Generalized anxiety disorders (anxiety, physical symptoms, worry and attention deficit). Policy makers, ministries of education and school administrators should also do more through the design of policies and employment of educational psychologists in schools who will implement interventions that identify and challenge students with Psychological and mental health problems and also make referral where necessary for appropriate interventions.

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