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Influence of Cognitive Behaviour Therapy on Managing Aggressiveness among Out-of-School Adolescents in Ondo State

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Abstract

This study investigated the influence of Cognitive Behavioural Therapy (CBT) on aggressive behaviour among out-of-school adolescents in Ondo West Local Government Area of Ondo State, Nigeria. The study aimed to (a) determine the extent of aggressive behaviour among out-of-school adolescents, (b) examine the effect of CBT on aggression reduction, and (c) explore the influence of gender on the effectiveness of CBT. A descriptive survey and quasi-experimental research design was adopted. A total of 150 out-of-school adolescents were selected through simple random sampling from communities within the study area. Data were collected using a structured questionnaire and analysed using descriptive statistics, Pearson Product Moment Correlation (PPMC), analysis of variance (ANOVA), multiple regression, and paired-samples t-tests at a 0.05 level of significance. Findings revealed that aggressive behaviour was moderate among participants, with verbal and emotional forms being most prevalent. CBT significantly reduced aggressive behaviour (Cohen's d = 0.85) and enhanced cognitive functioning (Cohen's d = 0.94) post-intervention. CBT group membership was the strongest predictor of reduced aggression ($\beta = -0.567$, $p < .001$), accounting for 21.5% of variance in post-intervention aggression scores. Gender did not moderate CBT outcomes ($p = .854$), indicating equal effectiveness across male and female participants. The study concludes that CBT is a practical, evidence-based, and culturally adaptable intervention for managing aggression among socially vulnerable adolescents in low-resource Nigerian contexts.

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1. INTRODUCTION

The transition from childhood to adulthood can be a difficult period of life, called adolescence, that spans from 10 to 19 years (World Health Organization [WHO], 2018). This is a time of great neurological, emotional and social change, with the brain's prefrontal cortex rapidly developing during this time, which controls impulse control and decision-making (Steinberg, 2014). Adolescents lacking the structure and support of formal schooling are more vulnerable to environmental stressors that can exacerbate these vulnerabilities. The resulting risk behaviours—aggressiveness, substance abuse, delinquency and criminal behaviors, are serious challenges to families, communities and public health systems (Adebayo & Ogunleye, 2020).

One of the biggest issues in the social policy making context in Nigeria, is the magnitude of educational out-of-schoolness of adolescents. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2022), there are about 18.5 million children and adolescents out of school in Nigeria, a rate which is among the highest in the world. The population in Ondo West Local Government Area of Ondo State, as in other parts of the country, is beset by the challenge of a combination of socio-economic deprivation, barriers to education, lack of social protection and limited access to mental health services due to cultural reasons. These adolescents are prone to having aggressive behaviour patterns that persist if they do not have structured educational engagement (Ekpenyong & Olofintoye, 2021).

Aggression of adolescents out of school is expressed in various ways such as physical violence, verbal hostility, relational aggression, and cyber-aggression (Anderson & Bushman, 2018). Theoretically these behaviours are associated with the interaction between cognitive distortions (systematic errors in thinking) and maladaptive emotional responses. Following Beck's Cognitive Behaviour Theory (CBT), the theory is well validated and explains that when people have dysfunctional core beliefs and automatic negative thoughts, they are likely to misread neutral or ambiguous social situations as threatening, and respond aggressively to them (Beck & Dozois, 2011). Structured psychotherapeutic intervention may thus offer a theoretically and empirically sound method of aggression reduction by addressing these underlying cognitive underpinnings.

CBT is a structured, time-limited, goal-oriented approach that focuses on the links between thoughts, feelings, and behaviours (Beck, 2020). Its effectiveness for a wide variety of psychological problems such as depression, anxiety, post-traumatic stress and behavioral issues is well documented in international literature (Hofmann et al., 2012). But the literature on its use in relation to aggressive behaviour, in the context of out-of-school adolescents in sub-Saharan Africa, is still rather limited. The findings of most existing studies are based on high-income countries, and Western countries, and therefore may not be generalizable to other populations in different contexts, such as Ondo West region, with a different cultural and economic background and institutional setting.This study therefore aims to address this gap by examining the influence of CBT on managing aggressiveness among out-of-school adolescents in Ondo West Local Government Area. Specifically, the study investigates: (a) the extent of aggressive behaviour among out-of-school adolescents in the study area; and (b) the influence of CBT-based intervention on reducing such behaviour. Three hypotheses were tested: (Ho1) there is no significant relationship between cognitive behaviour and aggressive behaviour; (Ho2) CBT outcomes are not significantly differentiated by sex; and (Ho3) cognitive behaviour therapy variables do not significantly influence aggressive behaviour. These objectives and hypotheses collectively address a critical gap in the Nigerian counselling literature and have direct implications for youth rehabilitation policy and practice.

2. LITERATURE REVIEW

2.1 Aggressive Behaviour among Out-of-School Adolescents

Aggressive behavior may occur in a variety of ways: physical, verbal, relational and cyber-aggression. It can be reactive (in response to a perceived provocation) or proactive (as a way to acquire resources and/or maintain status) (Vaughan et al., 2024; Balza, 2021). Because of the overlap of biological, psychological and environmental risk factors that happen out of school, adolescent aggressive behaviour is higher than that of school-age children. In adolescence, important neurobiological changes occur, such as the development of hormones, and the prefrontal cortex, making it easier to become reactive in aggressive situations, particularly in the presence of chronic stress, exposure to trauma, and/or substance use (Calvete & Orue, 2023). Aggressive reactions are more likely in individuals with psycho-social factors like low emotional regulation, high levels of impulsivity and low frustration tolerance (which is also not uncommon in this population). Out-of-school youth are at a greater risk of peer violence, community unrest, and poverty compared to in-school youth, because they do not have the same level of supervision and positive peer models, and developmental scaffolding that formal school provides (Wolke & Lereya, 2015).

Adolescents out of school (OOSA) are a highly vulnerable population that is excluded from formal schooling, at risk of conduct problems, gang involvement, substance use and violent crime in Nigeria alone there are about 10.5 million (UNICEF, 2023). A study conducted in Ondo State by Ogunleye and Adediran (2021) revealed that out-of-school adolescents have significantly higher rates of verbal and physical aggression as compared to the in-school adolescents with verbal and physical aggression associated with economic hardship, family instability and poor access to psychosocial support services.

2.2 Empirical Evidence for CBT in Reducing Adolescent Aggression

A large and growing body of empirical evidence shows the efficacy of CBT in the reduction of aggressive behavior in various populations and contexts among adolescents. The systematic reviews and meta-analyses (Beelmann & Lösel, 2020; O'Leary & Durlak, 2019) have found moderate to large decreases in verbal and physical aggression in CBT-based programmes. Cognitive restructuring to decrease hostile attributional bias, anger management training to help manage physiological and emotional responses, problem-solving skills training to offer alternatives to responding to conflict aggressively and behaviour rehearsal to build repertoires of prosocial responses are all active mechanisms (Sukhodolsky et al., 2016; Kazdin, 2017).

Other mechanistic evidence has been found in the field of neurobiology, where CBT has been found to strengthen the link between the prefrontal cortex and the amygdala, with a resulting increase in regulation of emotional reactivity and impulsivity, which is relevant for aggressive behavior (Hofmann et al., 2017). Ogunleye and Adediran (2021) and Ajayi (2022) conducted studies on the delivery of CBT in community settings in Nigeria and sub-Saharan Africa, showing remarkable decrease in self-reported aggression and improvement in anger management after the delivery of CBT, especially when culturally adapted. Bamidele and Okonkwo (2022) also reported in Southwest Nigeria residential care facilities that group format CBT decreased bullying, impulsivity and relational aggression and increased peer support and social skills. The studies carried out in Nigeria suggest that the CBT does not discriminate against gender as there were no significant differences between the outcome of CBT in males and females (Ofole & Adebayo, 2021; Adegoke & Oladipo, 2022), which indicates that the approach is widely applicable. Family/community involvement is a key moderator of the maintenance of outcomes for CBT programmes (Eyberg et al., 2018).

3. METHOD

3.1 Research Design

This study employed a descriptive survey and quasi-experimental research design. The descriptive component gathered baseline data on the nature and extent of aggressive behaviour among out-of-school adolescents. The quasi-experimental component facilitated evaluation of CBT's influence on behaviour change through pretest–posttest measurement of cognitive and aggressive behaviour scores in CBT-exposed and control group participants.

3.2 Participants and Sampling

The target population comprised all out-of-school adolescents, both male and female, residing within Ondo West Local Government Area of Ondo State, Nigeria. Using simple random sampling to minimise selection bias and enhance representativeness, a total of N = 150 participants were recruited. The sample comprised 73 males (48.7%) and 77 females (51.3%), reflecting an approximately balanced gender distribution. Of all participants, 43.3% had been out of school for more than one year, and 38.0% for six months to one year, indicating that most had experienced sustained educational exclusion prior to the study.

3.3 Instrument

Data were collected using a structured questionnaire: "The Influence of Cognitive Behaviour Therapy on Managing Aggressiveness among Out-of-School Adolescents" organised into two sections. Section A elicited demographic information including gender and duration of school non-attendance. Section B assessed aggressive behaviour and CBT influence using items presented on a four-point Likert scale ranging from Strongly Agree (4) to Strongly Disagree (1). Face and content validity were established through expert review by the research supervisors and two educational research specialists, whose feedback was incorporated into the final instrument. Test–retest reliability was determined by administering the questionnaire to a comparable out-of-area sample twice over a two-week interval, yielding a high correlation coefficient indicating satisfactory reliability.

3.4 Procedure

The researcher personally administered the questionnaires to all participants to ensure a high response rate and clarity of instructions. Participants were assured of the confidentiality of their responses and the voluntary nature of their participation in compliance with ethical research standards. CBT sessions were conducted in structured group format by trained counsellors, incorporating psychoeducation on the CBT model, cognitive restructuring exercises, anger management training, problem-solving skills instruction, and behavioural rehearsal. Pretest and posttest measures of aggressive behaviour and cognitive behaviour were obtained from both CBT and control group participants.

3.5 Data Analysis

Data were analysed using IBM SPSS Statistics (Version 25). Descriptive statistics (frequency counts, percentages, means, and standard deviations) summarised demographic characteristics and questionnaire item responses. Inferential statistics included Pearson Product Moment Correlation (PPMC) to examine bivariate relationships between cognitive and aggressive behaviour; a two-way ANOVA to test for differences in CBT outcomes by group and sex; multiple regression analysis to assess predictors of post-intervention aggressive behaviour; and paired-samples t-tests with Cohen's d effect sizes to evaluate within-group change following CBT. All hypotheses were tested at $\alpha = .05$.

4. RESULTS

4.1 Extent of Aggressive Behaviour among Out-of-School Adolescents

Table 1 presents descriptive statistics for the aggressive behaviour scale. Results indicate a moderate level of aggression overall, with verbal and emotional expressions most prevalent. Shouting at friends when angry produced the highest mean (M = 2.78, SD = 1.055), while arguing loudly (M = 2.44) and losing one's temper quickly (M = 2.42) were also relatively

frequent. Physical and property-directed aggression indicators obtained lower means, suggesting that verbal and emotional forms of aggression are more characteristic of this population than overt physical violence.

Table 1: Descriptive Statistics for Aggressive Behaviour Items (N = 150)

Item	N	M	SD	Remark
I get into physical fights	150	2.16	1.259	Moderate
I shout at friends when angry	150	2.78	1.055	Mod-High
I use harsh words to control friends	150	2.33	1.109	Moderate
I deliberately damage property	150	2.15	1.032	Moderate
I am always hostile	150	2.15	1.108	Moderate
I bully others unjustly	150	2.19	1.034	Moderate
I lose my temper quickly	150	2.42	1.095	Moderate
I shove others when upset	150	2.39	1.135	Moderate
I argue loudly with friends	150	2.44	1.229	Moderate
I hurt someone's feelings intentionally	150	2.14	1.010	Moderate
I intimidate others occasionally	150	2.22	1.074	Moderate

Note. M = Mean; SD = Standard Deviation. Scale: 1 = Strongly Disagree to 4 = Strongly Agree.

4.2 Hypotheses Testing

Hypothesis 1: Relationship between Cognitive Behaviour and Aggressive Behaviour

A Pearson correlation was computed between cognitive behaviour (CB) and aggressive behaviour (AB) pretest and posttest scores. As shown in Table 2, cognitive pretest and posttest scores were strongly correlated ($r = .835$, $p < .01$), indicating high internal consistency in cognitive development across the intervention period. Critically, the correlation between cognitive behaviour posttest and aggressive behaviour posttest was weak and negative ($r = -.025$), suggesting that improved cognitive awareness post-CBT was associated with a slight decrease in aggression. Although this relationship did not reach statistical significance, its direction is theoretically consistent with CBT's proposed mechanism of change. Ho1 was therefore retained.

Table 2: Pearson Correlation Matrix: Cognitive and Aggressive Behaviour (N = 150)

Variable	CB Pre	CB Post	AB Pre	AB Post
CB Pretest	1.000	0.835**	0.057	0.106
CB Posttest	0.835**	1.000	0.093	−0.025
AB Pretest	0.057	0.093	1.000	0.802**
AB Posttest	0.106	−0.025	0.802**	1.000

Note. CB = Cognitive Behaviour; AB = Aggressive Behaviour. ** $p < .01$ (2-tailed).

Hypothesis 2: Gender as a Moderator of CBT Outcomes

A two-way ANOVA examined the main effects of CBT group membership and sex, as well as their interaction, on cognitive behaviour scores. Table 3 presents the results. Group membership exerted a significant main effect ($F(1, 146) = 13.784$, $p < .001$, $\eta^2 = .086$), confirming that CBT meaningfully improved cognitive functioning relative to the control condition. However, sex yielded no significant main effect ($F(1, 146) = 0.034$, $p = .854$, $\eta^2 = .000$), and the Group × Sex interaction was non-significant ($F(1, 146) = 1.476$, $p = .226$, $\eta^2 =$

.010). These results indicate that both male and female adolescents benefitted equally from CBT, demonstrating the gender-neutral effectiveness of the intervention. Ho2 was retained.

Table 3: Two-Way ANOVA: Effect of CBT Group and Sex on Cognitive Behaviour (N = 150)

Source	SS	df	MS	F	p	Partial η^2
Corrected Model	266.11	3	88.70	5.235	.002	.097
Group (CBT vs. Control)	233.57	1	233.57	13.784	< .001	.086
Sex	0.574	1	0.574	0.034	.854	.000
Group × Sex	25.017	1	25.017	1.476	.226	.010
Error	2474.02	146	16.945	—	—	—

Note. SS = Sum of Squares; df = Degrees of Freedom; MS = Mean Square; η^2 = Partial Eta Squared.

Hypothesis 3: Predictive Influence of CBT Variables on Aggressive Behaviour

Multiple regression analysis was conducted to determine the extent to which CBT group membership, cognitive behaviour pretest, and cognitive behaviour posttest predicted aggressive behaviour posttest scores. Table 4 presents the regression coefficients and model summary. The overall regression model was statistically significant, $F(3, 146) = 13.347$, $p < .001$, $R^2 = .215$, indicating that the predictors collectively explained 21.5% of the variance in post-intervention aggressive behaviour scores. CBT group membership was the only significant predictor ($B = -6.802$, $\beta = -0.567$, $t = -5.479$, $p < .001$), indicating that participation in CBT was associated with substantially lower post-intervention aggression scores compared to the control group. Neither the cognitive behaviour pretest ($p = .184$) nor the posttest ($p = .069$) reached statistical significance. Ho3 was rejected.

Table 4: Multiple Regression Predicting Aggressive Behaviour Post-test (N = 150)

Predictor	B	SE	β	t	p
Constant	24.116	3.537	—	6.818	< .001
CB Pretest	−0.352	0.263	−.239	−1.336	.184
CB Posttest	0.481	0.262	.342	1.834	.069
Group (CBT vs. Control)	−6.802	1.241	−.567	−5.479	< .001

Note. CB = Cognitive Behaviour; SE = Standard Error; β = Standardised Coefficient.
Model summary: $R = .464$, $R^2 = .215$, Adjusted $R^2 = .199$, $F(3, 146) = 13.347$, $p < .001$.

Paired-Samples t-Test: Pre- to Post-Intervention Change

A paired-samples t-test compared pretest and posttest means for both cognitive behaviour and aggressive behaviour. Results (Table 5) showed a significant increase in cognitive behaviour scores (M difference = −2.27, $t(149) = -11.49$, $p < .001$, Cohen's $d = 0.94$) and a significant decrease in aggressive behaviour scores (M difference = 3.08, $t(149) = 10.46$, $p < .001$, Cohen's $d = 0.85$). Both effect sizes were large, indicating that CBT produced practically meaningful improvements in cognitive functioning and substantial reductions in aggressive behaviour.

Table 5: Paired-Samples t-Test: Pretest–Posttest Comparison (N = 150)

Measure	M Pre	M Post	Diff.	t	df	p	d
Cognitive Behaviour	30.77	33.04	−2.27	−11.49	149	< .001	0.94

Aggressive Behaviour	28.90	25.82	3.08	10.46	149	< .001	0.85

Note. M = Mean; Diff. = Mean Difference; d = Cohen's d effect size.

5. DISCUSSION

The results of this study provide valuable data to the literature on CBT based interventions for adolescent aggression in community based settings in sub-Saharan Africa. From the results, three important themes appear which have theoretical and practical implications.

First, the level of aggressive behaviour, though at a moderate level, observed in the out-of-school adolescents is in line with the social learning perspective as posited by Bandura (1978) which states that aggression is learned and is built from environmental exposure and peer modeling, mostly in the form of verbal and emotional aggression rather than through physical means. The lack of the school environment, which offers structure, supervision and pro-social peer interaction, may make it easier to become exposed to such verbal aggression modelled behaviour. The comparatively low level of physical aggression is as well consistent with the relatively low prevalence of the same in out of school youth in Southwest Nigeria reported by Adeniyi and Fawole (2019), and could be a manifestation of social desirability in self-report, or equally, of the early stage of aggressive trajectories in this population. However, as studies on developmental pathways have consistently shown, without intervention, verbal and emotional aggression can often worsen over time (Loeber & Farrington, 2012).

Secondly, the magnitude of change in cognitive functioning (Cohen's d = 0.94) and aggressive behaviour (Cohen's d = 0.85) in the present study are very similar to the findings in the international literature regarding the efficacy of CBT. The effect sizes are similar to those found in Beelmann and Lösel (2020) and Sukhodolsky et al. (2016) meta-analyses as well as with Ogunleye and Adediran (2021), Ajayi (2022) local evidence in Nigeria. What is noteworthy is that the finding that the group membership of the CBT was the strongest and the only significant predictor of post-intervention aggression ($\beta = -0.567$, $p < .001$) accounted for 21.5% of the variance. The unaccounted for variance (about 78.5%) possibly comes from distal factors within the intervention, such as environmental, familial, and socioeconomic ones, which are not accounted for in the intervention but are consistent with the multi-determined nature of adolescent aggression (Miller et al., 2020) as well as the findings of Ogunleye and Adediran (2021) that distal factors such as family and community reinforcement of CBT learning significantly moderates long-term outcomes.

Third, the results in this study showed no significant gender differences in the outcome of the CBT ($p = .854$), which corroborates with current evidence in Nigeria and other parts of the world that the fundamental cognitive and behavioural processes of CBT are applicable across gender (Ofole & Adebayo, 2021; Adegoke & Oladipo, 2022; Nwachukwu & Okafor, 2018). The practical implication of this finding is that community-based CBT programme for out-of-school adolescents in Ondo West can be delivered in mixed-gender group format without loss of efficacy and can increase reach and cost effectiveness in resource-limited settings.

A non-significant weak negative correlation between post-CBT cognitive behaviour and aggressive behaviour ($r = -.025$) is of theoretical interest. This directionality is aligned with the hypothesised mechanism of action, namely, increase in cognitive functioning, which is reflected in the reduction of hostile attribution bias and increase in problem solving, should lead to a reduction in aggressive responding (Kazdin, 2017). This is perhaps a reflection of the short intervention period, the moderate cognitive change produced and the slower time-lagged and iterative change in behaviours compared to cognitive change. Sustained follow-up assessment might show a more significant relationship as cognitive gains become established as behaviour change.

6. CONCLUSION AND RECOMMENDATIONS

This study is intended to offer empirical evidence for the effectiveness of CBT as an evidence-based, gender friendly and feasible intervention to manage aggressive behaviours of out-of-school adolescents in Ondo West Local Government Area, Nigeria. The moderate to large effect sizes achieved for both cognitive and aggression reduction, and the adaptability of CBT group delivery across cultures, indicate that CBT has strong potential for intervening in the psychological aspects of youth vulnerabilities in low-resource communities in Nigeria.

Several recommendations are put forward, based on these findings. Counselling/rehabilitation programmes for out-of-school adolescents, offered by government community centres, non-governmental organisations and faith-based institutions, should formally use CBT as a key element in the interventions, using culturally relevant and manualised group programmes to maximise outreach. Second, there is a need for prioritizing capacity building to build CBT capacity of counsellors, social workers and community health workers such as cultural adaptation, group facilitation, and evidence-based outcome monitoring. Third, systematic incorporation of families and communities in CBT programmes should be achieved, as there is evidence that family inclusive approaches have a significant impact on maintaining treatment gains (Eyberg et al., 2018). Fourthly, government policy frameworks for youth welfare in Ondo State and Nigeria in general should acknowledge CBT based community intervention as a legitimate intervention and fundable aspect of youth rehabilitations and crime prevention. Fifth, future research should attempt to overcome the limitations of this study by using a randomised controlled design, extending the follow-up periods, exploring participants' lived experience of CBT, and assessing moderating factors, such as family background, peer influences and socioeconomic status.

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

Ethical Statement: The study was conducted in compliance with ethical standards for research involving human participants. Informed consent was obtained from all participants, and confidentiality of data was maintained throughout.

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