Effects of Cognitive Behavioural Therapy and Impulsivity on Depression and Anxiety in Women Living with HIV/AIDS in Abakaliki, Nigeria

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Abstract

This study examined the effects of cognitive behavioural therapy (CBT) and impulsivity on depression and anxiety among women living with HIV/AIDS in Abakaliki, Nigeria. Fifty female participants, aged 18 to 53, diagnosed with HIV, were selected using purposive sampling. The study adopted a quasi-experimental design in which the treatment group received CBT intervention while the control group received routine standard care. Three standardised instruments were used for data collection: Beck's Depression Inventory (BDI)-II, Beck's Anxiety Inventory (BAI), and the Barratt's Impulsiveness Scale (BIS-11), 50 participants were assigned equally, with 25 assigned to each of the intervention group and comparison group. Multivariate Analysis of Variance results indicated that Wilks' $\Lambda = .01$, $F(2, 45) = 0.72$, $p < .025$, partial $\eta^{\wedge 2} = .01$. To minimise the risk of a Type 1 error, the Bonferroni post hoc correction was applied by dividing the original alpha level of 0.05 by 2 (number of dependent variables), resulting in an adjusted alpha of 0.025. Thus, impulsivity did not have a significant effect on levels of depression and anxiety in this study. Findings revealed that impulsivity did not significantly influence depression and anxiety among the participants. However, cognitive behavioural therapy had a significant effect in alleviating depressive and anxiety symptoms among women living with HIV/AIDS. The interaction effect between CBT and Impulsivity was not significant. It is recommended that CBT-based interventions be integrated into routine psychological and medical care for people living with HIV/AIDS to enhance their psychological well-being.

Keywords: Cognitive behavioural therapy, impulsivity, depression, anxiety, women living with HIV/AIDS

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Introduction

The burden of women living with HIV/AIDS remains a significant global health challenge. Around 40.8 million people are living with HIV, and among them, approximately 21.6 million are women, as reported by UNAIDS (UNAIDS, 2024). Sub-Saharan Africa is disproportionately affected, with women accounting for about 61% of infections (UNAIDS, 2017). In Nigeria, recent estimates indicate that about 2 million people are currently living with HIV, with an adult prevalence rate of approximately 1.3% (National Agency for the Control of AIDS [NACA], 2024). Women constitute a significant proportion of individuals affected by HIV infection. In Ebonyi State, women living with HIV account for approximately 2.5% of the national total (HIV/AIDS Epidemic Control Report, 2023). Young women are particularly vulnerable, representing about 17% of reported HIV cases (CDC, 2017). This disparity has been linked to various socio-structural factors, including gender inequality, poverty, and involvement in transactional sexual relationships (ICRW, 2018; Lawrence et al., 2018; Ross, 2017).

HIV/AIDS has significant psychological implications, as people living with HIV/AIDS (PLWHA) often experience stigma, discrimination, and mental health challenges (Asare, 2022; Le Blanc et al., 2008; Whelan, 2002). Depression is particularly prevalent among PLWHA, with rates reported to be several times higher than those in the general population in Nigeria (Chikezie et al., 2013; Gaynes et al., 2012). Regional studies report prevalence rates of 33.3% in Enugu and 56.7% in North Central Nigeria (Iwuibia & Brown, 2014), while global estimates range from 13.7% in the United States to 80.6% in China (Adam et al.,2018; Rong et al., 2017). Women living with HIV are especially vulnerable due to caregiving responsibilities and additional psychosocial stressors, which contribute to higher depressive symptoms and poorer health outcomes such as increased viral load, lower CD4 counts, and faster disease progression (Bayon et al., 2012; Li et al., 2012; Leserman et al., 2018).

Anxiety is also common among PLWHA, with prevalence reported up to 43% (Brandt et al., 2017). Anxiety often co-occurs with depression and can negatively affect medication adherence, symptom management, and overall quality of life (Antoni, 2003; DiMatteo et al., 2000). Specific anxiety disorders range from 6.5% to 20% (Bing et al., 2001; Haller & Miles, 2003).

Cognitive Behavioural Therapy (CBT) is widely recognised as an effective intervention for reducing depression and anxiety among people living with HIV/AIDS (PLWHA) (Butler et al., 2019; Dobson, 2017; Gloaguen et al., 2019; Wilson et al., 2018). Empirical and meta-analytic studies further highlight its effectiveness in reducing psychological distress, depressive symptoms, and stress while improving overall well-being (Chibanda et al., 2015; Yan et al., 2021). However, limited research has examined the effectiveness of CBT in addressing depressive and anxiety disorders among women living with HIV across different levels of impulsivity.

The interaction between impulsivity, anxiety and depression among people living with HIV/AIDS (PLWHA) remains insufficiently explored. Impulsivity, characterised by rapid decision-making and limited forethought, has been linked to both anxiety and depressive symptoms (Gay et al., 2011; Johnson et al., 2022). Evidence suggests that individuals with higher levels of emotion-related impulsivity are more vulnerable to developing anxiety and depression, often acting impulsively when experiencing intense worry or negative emotions (Cougle et al., 2011; Kashdan & Hofmann, 2008). Among individuals living with HIV, studies have also shown a significant association between

impulsivity traits and depressive symptoms, indicating that higher impulsivity is related to greater depression severity (Johnson et al., 2018; Zaldivar-Basurto et al., 2019). Despite these findings, research examining this relationship specifically among women living with HIV remains limited, highlighting the need for further investigation in this population.

This study aims to address how cognitive behavioural therapy and impulsivity could have effects on anxiety and depression in women living with HIV. It aims to understand the complex reciprocal influence between these variables and investigate the potential interaction effect of CBT and impulsivity in this context. By providing insight into these issues, the study intends to contribute to the development of targeted strategies to improve the mental health and overall well-being of women living with HIV/AIDS. This, in turn, could help bridge the gender gap in HIV prevalence and enhance the well-being of this vulnerable population.

Theoretical background and development of hypotheses

This study's theoretical foundation is built on Beck's Cognitive Theory, which provides crucial insights into the cognitive processes influencing depression and anxiety among women living with HIV. Beck's Cognitive Theory is central to understanding depression, emphasising the pivotal role of cognitive processes during the onset and persistence of depressive symptoms.

At the heart of Beck's theory is the negative cognitive triad: a pessimistic view of misaligned self-view, a bleak perspective of the global view, and a grim outlook on future existence. The cognitive triad may manifest in several ways. Negative perceptions of the self may involve feelings of guilt, shame, or self-blame associated with their diagnosis. Negative views of the world may emerge through perceived stigma, discrimination, and social rejection. Similarly, pessimistic expectations about the future may arise due to concerns about illness progression, mortality, and social relationships. These maladaptive cognitive patterns contribute significantly to the development and maintenance of depressive and anxiety symptoms in this population.

Role of cognitive behavioural therapy among women living with HIV/AIDS

Cognitive behavioural therapy is designed to modify these maladaptive cognitive processes. CBT operates on the principle that psychological distress is maintained by dysfunctional thinking patterns and maladaptive behaviours for women living with HIV/AIDS. CBT can help restructure harmful beliefs related to stigma, illness perception, and personal worth. By addressing these distorted thoughts, CBT reduces depressive and anxiety symptoms and promotes healthier coping strategies, emotional resilience, and improved psychological well-being.

Influence of impulsivity on emotional regulation and treatment outcomes

Impulsivity, characterised by acting without adequate reflection, can affect emotional regulation and engagement in therapy. High impulsivity may worsen depressive and anxiety symptoms and limit the effectiveness of CBT by reducing individual’s ability to apply cognitive and behavioural strategies during treatment.

This study is summarised in the conceptual model presented in Figure 1. CBT INTERVENTION, IMPULSIVITY, DEPRESSION & ANXIETY

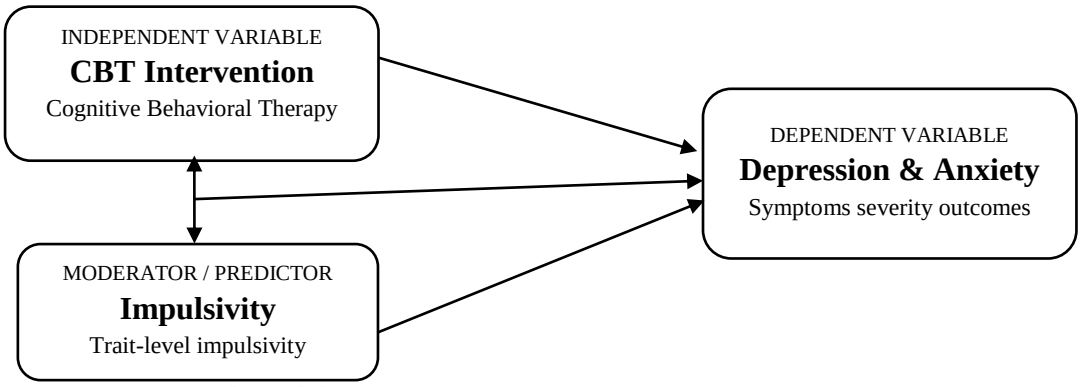

Fig 1. *Conceptual Model*

Cognitive behavioral therapy and depression/anxiety

Cognitive behavioral therapy (CBT) is well established as an effective psychological intervention for alleviating depression, anxiety, and stress, particularly among individuals living with chronic conditions such as HIV/AIDS. Empirical studies support its effectiveness in improving psychological well-being among people living with HIV (PLWH). For example, Atefeh et al. (2017) reported significant reductions in depression, anxiety, and stress among women with HIV who received CBT alongside routine care in Tehran. Similarly, Japheth et al. (2017) found that group-based CBT significantly reduced depressive symptoms among people PLWH in Kenya, with improvement maintained two months after treatment. Supporting these findings, Qin et al.(2022), in a meta-analysis of sixteen studies, confirmed the effectiveness of CBT in reducing depressive symptoms among PLWH, although improvements in antiretroviral therapy adherence were not statistically significant.

The effectiveness of CBT is grounded in its theoretical framework, which posits that maladaptive thoughts influence emotional and behavioral outcomes. By identifying and restructuring these distorted cognitions, individuals can achieve better emotional regulation and coping (Beck, 2011; Hofmann et al., 2012). Numerous studies have also demonstrated the broader effectiveness of CBT across clinical settings. For instance, Twomey et al. (2015) found that multimodal CBT significantly reduced depression and anxiety compared to treatment-as-usual, while Niles et al. (2021) reported large treatment effects for internet-delivered CBT in managing depression and anxiety disorders.

Despite the growing evidence supporting CBT, relatively few studies have examined its effectiveness specifically among women living with HIV/AIDS. However, Safren et al. (2012) demonstrated that CBT-based therapy for adherence and depression (CBT-AD) significantly improved both ART adherence and depressive symptoms among HIV-positive individuals. These findings highlight the potential of CBT in addressing psychological distress in HIV populations, thereby providing the basis for the present study.

Existing research demonstrates the effectiveness of cognitive behavioural therapy (CBT) in alleviating depressive and anxiety symptoms among people living with HIV. However, few studies have examined whether these benefits persist across individuals with differing personality traits, such as impulsivity. Impulsivity has been linked to emotional dysregulation and heightened vulnerability to psychological distress, which may influence treatment outcomes. CBT primarily focuses on cognitive restructuring and behavioural regulation, which may help individuals gain better control over impulsive tendencies and

improve emotional well-being. Therefore, it is reasonable to expect that CBT could remain effective in addressing depression and anxiety among women living with HIV, regardless of their level of impulsivity. Given the scarcity of empirical studies addressing this integration, particularly among women living with HIV in Abakaliki, the present study seeks to examine the effectiveness of CBT in reducing depressive and anxiety symptoms irrespective of impulsive traits within this population.

H1: Cognitive behavioural therapy will not significantly affect depression among women living with HIV in Abakaliki.

H2: Cognitive behavioural therapy will not significantly affect anxiety among women living with HIV in Abakaliki.

Impulsivity and Depression/Anxiety

Recent empirical studies have highlighted the role of impulsivity in various psychological outcomes across different populations. Evidence suggests that impulsivity is closely linked to emotional regulation and mental health conditions such as anxiety and depression. For instance, Barcala et al. (2022) examined female athletes and reported that higher levels of physical activity were associated with lower impulsivity and greater mindfulness, with mindfulness moderating the relationship between impulsivity and anxiety. Similarly, Fresan et al. (2021), in their study of patients diagnosed with Generalised Anxiety Disorder (GAD), found that more than half of the participants were clinically depressed and exhibited significantly higher levels of anxiety and impulsivity compared to non-depressed patients, suggesting a shared underlying mechanism among anxiety, depression, and impulsive tendencies.

Further evidence supporting this relationship was provided by Ferreira-Garcia et.al. (2022), who investigated impulsivity among individuals with GAD and identified negative effect as a significant mediator between GAD and impulsivity. Their findings suggest that heightened negative emotions may drive impulsive behaviour, highlighting a common vulnerability factor across mood and impulse-control disorders. In a broader perspective, Moore (2021) conducted a meta-analysis examining the association between impulsivity, aggression, and suicidality among adults. The findings revealed that both trait and behavioural impulsive aggression were strong predictors of suicide, emphasising the importance of considering impulsivity in psychological assessments.

Earlier theoretical and empirical work by Swann et al. (2009) also suggests that impulsivity functions as a personality trait that predisposes individuals to episodes of mania and severe depression, indicating that impulsivity may operate both as a baseline vulnerability factor and as a mood-dependent amplifier of emotional dysregulation. Although existing literature has established the relationship between impulsivity and mental health outcomes across several populations, there remains a paucity of research specifically examining impulsivity among women living with HIV/AIDS. Given this gap in the literature, the present study hypotheses that impulsivity may significantly influence depressive and anxiety symptoms among women living with HIV/AIDS.

Recent empirical studies highlight the significant role of impulsivity in psychological outcomes. Johnson and Smith (2021) reported that higher impulsivity is associated with increased depressive and anxiety symptoms among women living with chronic conditions. Similarly, Lee et al. (2022) found that impulsive individuals are less likely to adhere to therapeutic interventions, which can exacerbate mental health challenges.

Evidence also suggests that cognitive behavioral therapy (CBT) can mitigate these effects; Rodriguez and Patel (2020) demonstrated that participants with high impulsivity experienced significant reductions in anxiety following CBT. Collectively, these findings underscore the importance of examining impulsivity in studies on mental health interventions, particularly in clinical populations such as women living with HIV.

H3: Impulsivity will not significantly affect depression among women living with HIV/AIDS in Abakaliki.

H4: Impulsivity will not significantly affect anxiety among women living with HIV/AIDS in Abakaliki.

H5: Cognitive-behavioural therapy and impulsivity will not have a significant interaction effect on depression among women living with HIV/AIDS in Abakaliki.

H6: Cognitive-behavioural therapy and impulsivity will not have a significant interaction effect on anxiety among women living with HIV/AIDS in Abakaliki.

Method

Participants

The study involved 50 women living with HIV/AIDS, selected from the patient population at Alex Ekwueme Federal Teaching Hospital in Abakaliki, Nigeria. Purposive sampling was employed, focusing exclusively on women living with HIV to ensure a targeted and representative sample.

In addition, participants are females, aged 18 years and older, with a medical diagnosis confirming HIV positive status and a minimum of six months residency in Abakaliki. Participants also needed to score above 18 on the Beck's Depression Inventory with a clinically significant level of depressive symptoms and anxiety on the Beck's Anxiety Inventory.

The demographic data collected included age, marital status, employment status, education level, and the duration of HIV diagnosis. Participants' ages ranged from 20 to 53 years (Mean = 37.24, SD = 8.99). Educational qualifications varied: 5 (10%) had a primary school certificate, 9 (18%) had an SSCE, 29 (58%) had a BSC/HND, and 7 (14%) had an MSC/PhD. Marital status was diverse, with 16 (32%) single, 28 (56%) married, 3 (6%) separated/divorced, and 3 (6%) widowed. The duration of HIV diagnosis also varied: 16 (32%) were diagnosed less than a year ago, 19 (38%) within 1-5 years, 9 (18%) between 6-10 years, and 6 (12%) over 10 years ago.

Informed consent, emphasising confidentiality and voluntary participation, was obtained from all participants. Three final-year psychology students were trained as research assistants by a clinical psychologist to ensure unbiased data collection. Participants were screened for impulsivity using Barratt's Impulsiveness Scale, ensuring an even distribution of low and high impulsivity levels across experimental (Low = 10, High = 15) and control groups (Low = 10, High = 15). Random assignment was conducted using a randomised controlled trial (RCT) design. Participants were divided into an experimental group receiving cognitive behavioural therapy (CBT) (n = 25) and a control group receiving standard HIV/AIDS counselling (n = 25).

All participants had moderate or severe anxiety and depression according to pre-test data. CBT sessions, led by licensed therapists, lasted 60-90 minutes and included cognitive restructuring, behavioural activation, psychoeducation, and skills training. The intervention lasted 8 weeks, with weekly sessions to ensure consistent progress.

Measures

Three standardised instruments were used for data collection alongside a demographic questionnaire.

Beck Depression Inventory (BDI)-II: Depressive symptoms were measured using the Beck Depression Inventory (BDI)-II (Beck & Steer, 1996). This 21-item instrument measured four components of depressive symptoms: thought-related, action-based, mood-related, and physiological (Steer et al., 1999; Brown et al., 1995). The Beck Depression Inventory-II (BDI-II) is a 21-item self-report instrument measuring depressive symptom severity. Each item is rated on a 4-point scale (0-3), yielding total scores ranging from 0 to 63. In the Nigerian context, a score of 18 and above indicates a depressive disorder (Adebayo, 1996; Olley et al., 2001; Awaritefe, 1998). The scale has been validated in the Nigerian context with demonstrated internal consistency ($\alpha = 0.88$) (Ogakwu et al., 2022).

Beck Anxiety Inventory (BAI): Anxiety levels were assessed using the Beck Anxiety Inventory (BAI) (Beck & Steer, 1993). The BAI is a self-report measure that consists of 21 items, each describing prevalent symptoms of anxiety. Participants rated the intensity of their symptoms over the past week on a 4-point Likert scale ranging from 0 (not at all) to 3 (severely). The BAI has shown a high level of reliability scale and study rigor which demonstrated strong consistency in earlier research, with Cronbach's alpha coefficients ranging from 0.92 to 0.94, indicating strong reliability (Beck & Steer, 1993). It also exhibits good concurrent validity, as evidenced by significant correlations with other established measures of anxiety, such as the State-Trait Anxiety Inventory (STAI) (Osman et al., 1997). The BAI has been adapted to the Nigerian context and has established validity and reliability values. The reliability analysis yielded a Cronbach's coefficient of 0.82 (Anyebe et al., 2023). Anxiety levels were statistically analyzed base on received scores from BAI: 0–17 points indicate low anxiety, 18–24 points indicate moderate anxiety, and 25 and higher points indicate the presence of severe anxiety (Bulut & Bulut, 2016).

Barratt Impulsiveness Scale (BIS-II): Impulsive behaviours were measured through the Barratt Impulsiveness Scale (BIS-11) (Barratt, 1990). The BIS-11 comprises 30 items that assess different facets of impulsivity, such as acting without thinking, lack of premeditation, and sensation seeking. Participants respond to each item on a 4-point Likert scale ranging from "rarely/never" to "almost always/always." Higher scores on the scale reported heightened impulsivity. In the context of this investigation, the BIS-11 was adapted to the Nigerian context, ensuring its relevance and applicability to the local population. We assessed the internal consistency of the Barratt Impulsiveness Scale (BIS-11) using data from our sample of 50 women living with HIV. Cronbach's alpha was calculated to evaluate the reliability of the scale within this Nigerian context the overall Cronbach's alpha for the BIS-II in our sample was ($\alpha = 0.78$), indicating adequate reliability for the sample unlike, Previous research by Nweze et al. (2020) which demonstrated the internal consistency of the BIS-II in the Nigerian context, with a reported Cronbach's alpha coefficient of ($\alpha = 0.54$).

Demographic Questionnaire: This section collected information on participants' age, marital status, educational status, employment status and duration of HIV diagnosis.

Procedure

The Department of Psychology, Alex Ekwueme Federal University, Ndufu-Alike, Research and Ethics Review Committee approved the study by issuing an ethics clearance letter. This letter was subsequently taken to the health facility where the research was conducted, ensuring formal approval and compliance with ethical standards. Following ethical clearance, informed consent was obtained from all participants, emphasising confidentiality, privacy, and the right to withdraw from the study at any time without repercussions.

Respondents who met the inclusion criteria were naturally grouped based on their clinical attendance at the ART clinics. Although the study was not a randomised controlled trial (RCT), it employed a Quasi-experimental design, assigning participants to either the CBT-intervention group or the comparison (non-intervention) group. Both groups completed the pretest measures, including the BDI-II, BAI, and BIS-II.

The CBT intervention was conducted over eight weekly sessions, each lasting approximately 60minutes. Sessions were facilitated by trained clinical psychologists and conducted in small groups of 8-10 participants. The CBT program focused on the following modules:

Session1-2: Psychoeducation on HIV, mental health, and the CBT model.
Session 3: Detecting spontaneous thoughts and cognitive errors.
Session 4: Correcting dysfunctional thoughts.
Session 5: Behavioural activation and self-monitoring.
Session 6: Coping skills for stigma, self-blame, and emotional regulation.
Session 7: Relapse prevention and reinforcement of adaptive thinking.
Session 8: Review and termination-reinforcing learned strategies.

Participants in the Non-Intervention group received the facility's normal routine care counselling, given in the ART departments, which primarily focused on medication compliance, lifestyle guidance, and nutritional advice, without any cognitive-behavioural components.

Design/Statistics

This study adopted a quasi-experimental approach due to practical conditions and ethics-professional considerations inherent in the research context. Data analysis was conducted using Multivariate Analysis of Variance (MANOVA). A Bonferroni adjustment was applied to control for Type1 error across the two dependent variables, resulting in an adjusted significance level of $p<.025$. The adoption of MANOVA was considered appropriate due to its suitability for analysing the relationship between multiple dependent variables (depression and anxiety scores) and multiple independent variables (impulsivity and cognitive behavioural therapy) simultaneously (Tabachnick & Fidell, 2019). MANOVA allows for the examination of interactions between independent variables, such as the interaction between impulsivity and cognitive behavioural therapy, which is particularly relevant to the investigation focus on understanding the combined effects of impulsivity and therapeutic intervention on depressive and anxiety outcomes amongst women living with HIV/AIDS in Abakaliki. The statistical evaluation was conducted using SPSS statistical software, version 22. Descriptive statistics, including means, standard deviations, and frequencies, were calculated to outline participant characteristics and outcome factors.

Results

Table 1: Descriptive Statistics Showing the Overall and Group Means and Standard Deviations of Participants' Depression and Anxiety Levels in the Treatment and Control Groups with various Impulsivity Levels

Variable	*Impulsivity level*	*Group*	*M*	*SD*	*N*
Anxiety	Low	Control Group	39.10	5.685	10
		Treatment Group	19.40	10.405	10
		Total	29.25	12.989	20
	High	Control Group	37.80	7.331	15
		Treatment Group	18.13	6.512	15
		Total	27.97	12.102	30
	Total	Control Group	38.32	6.625	25
		Treatment Group	18.64	8.108	25
		Total	28.48	12.349	50
Depression	Low	Control Group	35.00	7.180	10
		Treatment Group	21.00	10.812	10
		Total	28.00	11.462	20
	High	Control Group	36.27	7.382	15
		Treatment Group	19.87	6.988	15
		Total	28.07	10.929	30
	Total	Control Group	35.76	7.178	25
		Treatment Group	20.32	8.523	25
		Total	28.04	11.029	50

Note. M= Mean; SD = Standard Deviation

Based on the results shown in the descriptive statistics table (Table 1), for anxiety, among participants with Low impulsivity, those in the Treatment Group reported a lower mean anxiety score (M = 19.40, SD = 10.405) compared to those in the Control/Non-Treatment Group (M = 39.10, SD = 5.685). Similarly, among participants with High impulsivity, those in the Treatment Group had a lower mean anxiety score (M = 18.13, SD = 6.512) compared to those in the Control Group (M = 37.80, SD = 7.331). Overall, participants in the Treatment Group, regardless of impulsivity level, exhibited lower mean anxiety scores compared to those in the Control Group.

For depression, among participants with Low impulsivity, those in the Treatment Group had a lower mean depression score (M = 21.00, SD = 10.812) compared to those in the Control Group (M = 35.00, SD = 7.180). Similarly, among participants with High impulsivity, those in the Treatment Group had a lower mean depression score (M = 19.87, SD = 6.988) compared to those in the Control Group (M = 36.27, SD = 7.382). Overall, participants in the Treatment Group, regardless of impulsivity level, exhibited lower mean depression scores compared to those in the Control Group.

Table 2: Multivariate Analysis of Variance

Following confirmation that these assumptions were satisfied, the MANOVA was conducted to examine the main and interaction effects of **Cognitive Behavioral Therapy (CBT)** and **Impulsivity** on depression and anxiety in women living with HIV/AIDS in Abakaliki.

Effect size interpretation

The magnitude of the effects was interpreted using partial eta squared (η^²). According to conventional benchmarks, .01 demonstrate a small effect, .06 demonstrate a medium effect, and .14 indicates a large effect.

***Post-Hoc Analysis*:** following value main effects, Bonferroni post hoc tests were performed to examine pairwise differences among the groups.

Result of Multivariate Tests Showing the Main and Interaction Effects of Cognitive Behavioural Therapy and Impulsivity on Depression and Anxiety.

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Wilks' Lambda	.040	533.354[b]	2.000	45.000	.000	.960
Impulsivity	Wilks' Lambda	.992	.179[b]	2.000	45.000	.837	.008
CBT Group	Wilks' Lambda	.299	52.657[b]	2.000	45.000	.000	.701
Impulsivity CBT Group	Wilks' Lambda	.994	.136[b]	2.000	45.000	.873	.006

a. Design: Intercept + Impulsivity + CBT Group + Impulsivity + CBT Group
b. Exact statistic

Results from Table 2 showed statistical main effect of impulsivity on depression and anxiety was not significant, as indicated by Wilks' Lambda (Λ = .01), F(2, 45) = 0.719, p > .025. The effect size, as measured by partial eta squared, was minimal (partial η^² = .01). This suggests that impulsivity alone had a statistically significant impact on levels of depression and anxiety in the sample population.

The main impact of cognitive behaviour therapy (CBT) on depression and anxiety was significant (Λ = .299), F(2, 45) = 52.657, p < .001. The effect size, as measured by partial eta squared, was substantial (partial η^² = .701), indicating that CBT had a significant impact on the levels of depression and anxiety in the sample population.

The interaction effect between impulsivity and the CBT-based therapy on depressive symptoms and anxious symptoms was not significant (Λ = .994), F(2, 45) = .136, p > .025. The effect size, as reported by partial eta squared, was negligible (partial η^² = .006). This suggests that the combined influence of impulsivity and CBT had no statistically significant impact on the levels of depression and anxiety in the sample population.

Table 3: Test of Between-Subject Effects Showing the Main and Interaction Effects of CBT and Impulsivity on Depression and Anxiety

Tests of Between-Subjects Effects							
Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Anxiety	4861.047[a]	3	1620.349	28.542	.000	.651
	Depres	2997.253[b]	3	999.084	15.512	.000	.503
Intercept	Anxiety	39284.963	1	39284.963	691.999	.000	.938
	Depres	37721.653	1	37721.653	585.687	.000	.927
Impulsivity	Anxiety	19.763	1	19.763	.348	.558	.008
	Depres	.053	1	.053	.001	.977	.000
CBT Group	Anxiety	4649.203	1	4649.203	81.895	.000	.640
	Depres	2772.480	1	2772.480	43.047	.000	.483
Impulsivity CBT Group	Anxiety	.003	1	.003	.000	.994	.000
	Depres	17.280	1	17.280	.268	.607	.006
Error	Anxiety	2611.433	46	56.770			
	Depres	2962.667	46	64.406			
Total	Anxiety	48028.000	50				
	Depres	45272.000	50				
Corrected Total	Anxiety	7472.480	49				
	Depres	5959.920	49				

a. R Squared = .651 (Adjusted R Squared = .628)
b. R Squared = .503 (Adjusted R Squared = .470)

The analysis between-subjects effects for anxiety revealed a significant overall model effect, showing that the combination of predictors (Impulsivity and Cognitive Behavior Therapy [CBT]) significantly forecasted anxiety levels, $F(3, 46) = 28.542$, $p < .001$, partial $\eta^2 = .651$. when examining individual effects the CBT Group had a significant main effect on anxiety, $F(1, 46) = 81.895$, $p < .001$, partial $\eta^2 = .640$, suggesting that consenting participants in the intervention group experienced significantly different anxiety levels compared to those in the comparison/control group. However, neither Impulsivity ($F(1, 46) = 0.348$, $p = .558$, partial $\eta^2 = .008$) nor the interaction between Impulsivity and CBT ($F(1, 46) = 0.000$, $p = .994$, partial $\eta^2 = .000$) showed a statistical main effects on anxiety.

Similarly, for depression, the between-subjects effects analysis indicated a significant main effect of the model, demonstrating that the combined independent variables significantly predicted depression levels, $F(3, 46) = 15.512$, $p < .001$, partial $\eta^2 = .503$. Analysis of the individual effects revealed that the CBT Group had a significant main effect on depression, $F(1, 46) = 43.047$, $p < .001$, partial $\eta^2 = .483$, indicating that individuals in the intervention group exhibited significantly different when contrasted with those in the comparison group. However, neither Impulsivity ($F(1, 46) = 0.001$, $p = .977$, partial $\eta^2 = .000$) nor the interaction between Impulsivity and CBT Group ($F(1, 46) = 0.268$, $p = .607$, partial $\eta^2 = .006$) showed significant main effects on depression.

Discussion

The study's findings revealed several key insights into the interrelationship between impulsivity, CBT, and psychological well-being in women living with HIV/AIDS in Abakaliki. Firstly, the data revealed impulsivity had no significant impact on depression or anxiety within this population. This result contradicts previous research suggesting that impulsivity is linked to higher depressive and anxiety symptoms (Johnson et al., 2018; Gay, Schmidt, & Linder, 2011). On the other hand, the findings underscored the significant positive impact of cognitive-behavioural therapy (CBT) on reducing depression and anxiety among the participants. CBT proved effective in managing mental health distress, supporting previous studies that emphasise its efficacy across diverse populations (Spies et al., 2013). The results showed that CBT's structured approach to challenging negative thought patterns and modifying maladaptive behaviours was beneficial, irrespective of individual impulsivity levels. This aligns with Beck's cognitive theory, which forms the basis of CBT by targeting and reframing dysfunctional thoughts (Beck et al., 1979). The absence of interaction effects between impulsivity and CBT suggests that CBT's effectiveness in alleviating depression and anxiety is consistent across varying impulsivity levels, reinforcing its robustness as a therapeutic intervention for women living with HIV/AIDS. This finding diverges from some prior literature suggesting impulsivity may moderate the effectiveness of therapeutic interventions (Valls et al., 2020). Still, it underscores the versatility and resilience of CBT in addressing psychological well-being in this vulnerable population.

Implications of the Study

The study enhances theoretical models in psychology by integrating impulsivity as a factor in understanding depression and anxiety among individuals living with HIV/AIDS. This integration deepens our insight view of the subject matter, which handles the intricate relationship between these psychological variables and emotional health outcomes within the vulnerable populations.

Empirically, the study validates the clinical impact of the CBT-based therapy in minimizing depressive symptomatic levels and anxiety symptomatic among women with HIV/AIDS. This evidence strengthens the growing body of research supporting psychosocial interventions in improving mental health in this population.

Practically, the findings support incorporating CBT into routine HIV/AIDS care and highlight the importance of personalized interventions based on impulsivity levels. This approach can enhance the wellbeing of care and treatment endpoints for people living with HIV/AIDS.

Limitations of the Study and Suggestion for Further Studies

The study's limited sample size and reliance on purposive sampling technique limit the external validity of the findings of women living with HIV/AIDS. These constraints restrict the ability to draw robust conclusions, may not adequately reflect the diversity of the wider population characteristics, and experiences the broader and larger population. Additionally, the quasi-experimental design and potential social desirability bias in self-reported measures further affect the consistency and accuracy of the study's results.

To resolve the outlined constraints, future research should employ a more diverse and representative sampling approach, incorporating a multi-center design involving various healthcare facilities and regions. Additionally, conducting longitudinal studies with multiple follow-up assessments would offer deeper insights into the dynamic trajectories of depressive and anxiety symptoms over time.

Conclusion

This study really delved into how cognitive behavioral therapy and impulsivity intersect to affect depression and anxiety in women living with HIV/AIDS in Abakaliki. Overall, the results suggest that Cognitive Behavior Therapy significantly influenced both anxiety and depression levels among participants. However, Impulsivity alone did not have a statistically main effect on either anxiety or depression. Additionally, the interaction between Impulsivity and Cognitive Behavior Therapy did not significantly affect anxiety or depression levels. These research outcomes highlight the importance of Cognitive Behavior Therapy as a proven therapeutic intervention for managing symptoms of depression and anxiety among women living with HIV/AIDS in Abakaliki, while also suggesting that Impulsivity may not independently contribute to variations in anxiety or depression levels in this population due to the positive impact of the CBT-based therapy intervention.

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