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Influence of Self-efficacy and Outcome Expectation on Antiretroviral Therapy among Persons Living With HIV/AIDS in Benue State, North Central Nigeria

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Abstract

This study explored the impact of self-efficacy and outcome expectations—particularly anxiety—on adherence to antiretroviral therapy (ART) among individuals living with HIV/AIDS in Benue State, Nigeria. A descriptive survey design was employed, targeting a population of 52,400 individuals who had been on ART for at least one year across all General Hospitals in the 23 Local Government Areas of the state. From this population, a sample of 400 participants was selected through a two-stage sampling method. Data were collected using a validated 33-item questionnaire titled Perceived Determinants of Viral Load Adherence to Antiretroviral Therapy Questionnaire (PDVAARTQ), with a reliability coefficient of 0.723 determined by Cronbach's Alpha. Descriptive statistics such as mean and standard deviation were used to answer research questions, while inferential statistics including Pearson Product Moment Correlation and Chi-square tests were used to test hypotheses at a 0.05 level of significance. Findings indicated that anxiety, as a form of outcome expectation, had a statistically significant and moderately negative influence on ART adherence. This means that higher anxiety levels were associated with reduced adherence to treatment. On the other hand, self-efficacy exhibited a statistically significant and strong positive influence on ART adherence, showing that individuals with higher confidence in their ability to manage their health were more likely to stick to their medication regimen. Two hypotheses were tested. The first hypothesis (H_{01}), which stated that self-efficacy does not significantly influence ART adherence, was rejected based on Chi-square results showing a significant positive relationship ($p < 0.05$). The second hypothesis (H_{02}), positing that anxiety has no influence on adherence, was also rejected, as analysis confirmed a significant negative effect ($p < 0.05$). The study concluded that psychological factors such as self-efficacy and anxiety play critical roles in ART adherence. It recommended the establishment of comprehensive support systems that address psychological, medical, and social needs, tailored to the individual, to enhance treatment outcomes among people living with HIV/AIDS.

Keywords: Adherence, Self-efficacy, Outcome Expectation, Anxiety, Anti-Retroviral Therapy (ART).

Introduction.

Human Immuno-deficiency Virus (HIV), which is a retrovirus, is the causative agent of Acquired Immune Deficiency Syndrome (AIDS). The disease HIV/AIDS, remains a global public health challenge (Joint United Nation Programme on HIV/AIDS (UNAIDS, 2020). Globally, an estimated 38 million people were living with HIV in 2019 and out of this figure, an estimated 1.7 million cases were people newly infected with the virus.

The most recent results released by the Government of Nigeria indicate a national HIV prevalence in Nigeria of 1.4 percent among adults aged 15–49 year (UNAIDS (2020). Benue state has been considered among the 'hot zones' for HIV/AIDS in Nigeria (Olusegun et al., 2021). The National Agency for the Control of AIDS, NACA, disclosed that the prevalence rate of HIV/AIDS in Benue state has dropped from 12.9 to 4.7 per cent (Duru, 2021). However, the prevalence rate in the State continues to exceed the national average, which is at 1.4%. In a study done among. Nigerian state, here is a disparity in prevalence between urban and rural settlement with the former having a higher prevalence of HIV (Mahy et al., 2014). The study also revealed that the prevalence was higher among female than male with 4.0% and 3.2% respectively in 2007. Five years later in 2012, the female rate declined to 3.5% but was still higher than the male rate of 3.3% (National Agency for the Control of AIDS (NACA, 2015). The age group 35 – 39 years had the highest prevalence in 2012 with 4.4% compared to age 15 – 24 which accounts for 42% of new infections globally (Kharsany & Karim, 2016; Wang et al.., 2016).

International health initiatives have focused on expanding access to Anti-Retroviral Therapy (ART) in countries with high levels of HIV endemicity including Nigeria (Monjok et al., 2010). The incidence of HIV in Nigeria peaked in 2009 with 278,061 new infections, and the rate of new infections has continued to decline with 262,238 in 2011, 239,155 in 2013, and 227, 518 in 2014 (National Agency for the Control of AIDS (NACA), 2015).

With the intervention of the United States government through the PEPFAR in 2001, ARVs became free for those enrolled in care in treatment centers in Nigeria (Fagbemi et al., 2021). However, that also came with adherence challenges because ARVs are drugs to be taken for life. No matter the potency of the ARVs, without adherence to prescribed regimen ARV, there will be no effective management of HIV. In Nigeria, as in advanced nations, adherence to antiretroviral therapy (ART) has its challenges. According to Ogunsola et al. (2023) who did a systematic review of 13 published studies on adherence in Nigeria, the success of the ART expansion programs by global health initiatives is dependent on individuals' adherence to HIV medicines.

Antiretroviral Therapy (ART) is a medical treatment for individuals infected with the human immunodeficiency virus (HIV), the virus that causes acquired immunodeficiency syndrome (AIDS). ART involves the use of a combination of antiretroviral drugs to suppress the replication of the virus within the body. The primary goal of ART is to reduce the viral load in the bloodstream, allowing the immune system to function more effectively and slowing the progression of HIV-related diseases. Successful implementation of ART has significantly transformed HIV/AIDS from a once-deadly condition to a manageable chronic illness. ART typically consists of a combination of three or more antiretroviral. (Tang et al., 2022)

Adherence means sticking to ARV's as prescribed by the clinician. It is associated with most of the parameters that defined a good ART outcome such as low viral load, high Clusters of Differentiation-4 (CD4) counts, and low morbidity and mortality (Granchi et al., 2012).

Adherence has virologic, immunological, and clinical implications for HIV management outcomes. For example, poor adherence in pregnancy is known to increase disease progression and increase the risk of virus transmission to the child (Ekama et al., 2012; Vitalis, 2013; Bailey et al., 2014; Kanters et al., 2016; Nachega et al., 2016). Studies among geriatric patients also have shown that adherence is a challenge that cut across all ages (Kamkuemah et al., 2022). In a comprehensive systematic review and meta-analysis study of adherence in adolescents and young adult aged 15–24 years from 53 countries, 62.3% was found to be adherent. The highest adherence rates were from Africa (84%) and Asia (84%). This was followed by South America (63%), Europe (62%), and North America (53%) had the poorest rates of adherence (Kim et al., 2014). A meta-analysis of adherence in sub-Saharan Africa indicated adherence rates of less than 80% among 23% of Africans (Croomeet al., 2017). While there is no particular cut-off mark for adherence to be described as good adherence, most studies framed an adherence rate of 85% and above as good adherence (Falang et al., 2012; Suleiman & Momo, 2016). Adherence rates among people living with HIV (PLHIV) in Nigeria vary considerably depending on the instrument used in the measurement. There are several ways to measure adherence which include direct measures, secondary database analysis, electronic medication packing, pill count, clinician assessment and self-report (Lam & Fresco, 2015). Patient self-report, pharmacy refill records and pill counts are the commonest instruments of measure (McMahon et al., 2011).

Self-efficacy refers to an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments. Self-efficacy reflects confidence in the ability to exert control over one's own motivation, behavior, and social environment. Adegoke (2014) found that the mean HIV Adherence Self-Efficacy score was 6.45 out of a possible 10. Beliefs held by the participants about the importance of (necessity) and concerns about ART in the management of HIV infection were generally positive. There was a mean score of 4.05 out of 5, indicating a strong belief in the use of ART. There was a strong association between adherence self-efficacy and ART adherence ($p<0.001$) in the non-adherent participants. Regression analysis showed significance for adherence self-efficacy on ART nonadherence ($p < 0.041$), with adherence self-efficacy explaining 9.8% of the variance.

Outcome expectation such as happiness, vitality, anxiety or perceived stress, is the belief that the course of action will have a positive or negative effect on achieving a goal or managing a situation. Outcome expectancy refers to the value of the consequences of a behavior from the perspective of an individual. The higher these values are, the more likely people are to engage in the desired behavior. Reesor et al. (2017) stated that individuals commonly seek help for problem health behaviors, such as excessive drinking, smoking, and weight gain. Yet there is a high rate of recidivism in these behaviors because outcome expectancies are either too high, negative outcome expectancies are not considered, or outcome expectancies are not properly addressed. Health care providers are recommended to list the outcome expectancy for the problem behavior and corresponding treatment for their patient. Through the process it is important to acknowledge both the positive and negative outcomes of engaging in the problem behavior. Health care providers are then encouraged to have their patient identify the goals and objectives that will assist in achieving the desired outcome. By recognizing and addressing outcome expectancies, it is more likely that the patient will be less resistant to the health care provider’s recommendations to change problematic behavior.

Despite the availability of antiretroviral therapy (ART) in Benue State, Nigeria, adherence to treatment among people living with HIV/AIDS (PLHIV) remains a significant challenge. Poor adherence to ART contributes to virologic failure, increased risk of drug resistance, and overall poor health outcomes. Several psychosocial factors influence adherence behavior,

among which self-efficacy and outcome expectations—such as anxiety—play critical roles. However, limited research has been conducted within the local context to assess how these psychological factors impact ART adherence among PLHIV in Benue State. Understanding these influences is essential for designing interventions that can improve adherence rates and health outcomes.

Purpose of the Study

The main purpose of this study was to investigate the influence of self-efficacy and outcome expectation (specifically anxiety) on adherence to antiretroviral therapy among persons living with HIV/AIDS in Benue State, Nigeria.

Specific Objectives

1. To determine the influence of self-efficacy on adherence to antiretroviral therapy among people living with HIV/AIDS in Benue State; and
2. To examine the influence of outcome expectation (anxiety) on adherence to antiretroviral therapy among people living with HIV/AIDS in Benue State.

Methods

This study adopted a descriptive survey design. This design was deemed most appropriate because it allows for the collection of data from a large population to describe existing phenomena—in this case, the influence of self-efficacy and anxiety on adherence to antiretroviral therapy (ART) among individuals living with HIV/AIDS. The descriptive survey design is particularly useful for identifying patterns, relationships, and variations in behavior, perceptions, and experiences among respondents. It enabled the researcher to capture a snapshot of the attitudes and behaviors of the target population at a specific point in time without manipulating any variables. The descriptive survey design was selected because: It provides a reliable means of collecting quantitative data from a large and diverse population. It is effective for studies focused on understanding the current status of variables and relationships between them (such as self-efficacy, anxiety, and ART adherence). It allows for generalization of findings across the population, given adequate sampling. It supports the testing of hypotheses through statistical analysis, which was necessary to determine the significance and magnitude of influence of the independent variables on ART adherence.

The study was conducted in Benue State, located in the North-Central region of Nigeria. Benue is known to have one of the highest HIV prevalence rates in the country, which makes it a strategic location for studies related to HIV/AIDS management and intervention. The population of interest included all 52,400 HIV-positive individuals receiving care in the 23 General Hospitals across the 23 Local Government Areas (LGAs) in the state. These hospitals serve as major treatment and care centers for people living with HIV/AIDS, offering services such as HIV testing, counseling, antiretroviral therapy, and routine clinical monitoring. The state's unique epidemiological profile and healthcare structure made it an appropriate setting for assessing behavioral and psychological factors influencing ART adherence. The population of the study consisted of all 52,400 HIV Positive subjects in all the 23 General Hospital in the 23 LGAs in Benue State.

A sample of 400 HIV positive subjects was drawn from the population with a two-stage sampling procedure. In the first stage, the study adopted cluster sampling and all the 23 General Hospitals (GH) in the state were used as clusters. In the second stage, the number of patients on ART treatment in each General Hospital (GH) and the total number on treatment in all the GH were systematically used in calculating the proportion of the samples to be selected from each facility.

The instrument used is the researcher developed, validated and pre-tested questionnaire titled Psycho-Demographic Variables and Adherence to ART Questionnaire (PDVAARTAQ). The questionnaire is a structured close ended type developed based on the objectives of the study and was meant to elicit information to answer the research questions and test the hypotheses. The instrument was validated by 4 experts in the Department of Human Kinetics and Health Education, Benue State University, Makurdi. The reliability of the instrument was ascertained through Cronbach Alpha Statistic which yielded a reliability co-efficient indexabove 0.70 with a mean of 0.85 which was substantial for use in the study (Akem, 2007). Data were collected from the respondents in their respective health facilities.

Respondents filled and returned the completed questionnaire on the spot to avoid loss. Data were analysed using frequencies and percentages to answer research questions, The t-test was applied to evaluate the difference between group means while hypotheses were tested using Pearson chi-square statistic at .05 level of significance. All the analysis were computed u sing Statistical Package for Social Sciences (SPSS) version 26.

Results

Table 1**: Mean and Standard Deviation on the Influence of Self-efficacy on Adherence to Antiretroviral Therapy**

S/No.	Item Description	N	1	2	3	4	x	SD	Decision
1	I stick to my treatment plan even when the side effects begin to interfere with my daily activities.	400	75	53	123	149	2.86	1.11	
2	I integrate my treatment plan into my daily routine.	400	49	86	147	118	2.84	0.99	
3	I integrate my medication into my daily routine even if it means taking medication in front of people who don't know you are HIV positive.	400	28	92	116	164	3.04	0.96	
4	I stick to my treatment schedule even when my daily routine is disrupted.	400	36	218	30	116	2.56	1	
5	I stick to my treatment schedule when I am not feeling well.	400	18	102	137	143	3.01	0.89	
6	I stick to my treatment schedule even if it means changing my eating habits.	400	14	77	133	176	3.18	0.86	
7	I continue with my treatment even if doing so interferes with my daily activities.	400	29	55	123	193	3.2	0.93	
8	continue with the treatment my doctor prescribed even if my T-cells drop significantly in the next three months.	400	22	52	152	175	3.2	0.86	
9	I continue with my treatment even when I am feeling discouraged about my health.	400	39	52	149	160	3.08	0.96	
10	I continue with my treatment even when people close to me tell me that they don't think it is doing any good.	400	51	71	168	110	2.84	0.97	
	Cluster Mean and Standard Deviation		**36**	**86**	**128**	**150**	**2.99**	**0.99**	

Note:*1= Extremely not Confident, 2 = Not Confident, 3 = Confident and 4 = Extremely Confident*

Table 1 shows the mean scores and standard deviation of items 1-10 with a cluster mean of 2.99 and a standard deviation of 0.99. The cluster mean (x) of 2.99 is above the cut-off mean point of 2.50, hence the result implies that respondents have accepted with all the items on table 2. This therefore means that self-efficacy has positive influence on adherence to antiretroviral therapy among people living with HIV/AIDS in Benue State

Table 2: **Mean and Standard Deviation on the Influence of Outcome Expectation (Anxiety)on Adherence to Antiretroviral Therapy among Persons living with HIV/AIDS in Benue State**

S/No.	Item Description	N	1	2	3	4	x	SD	Decision
11	Worrying too much about my health interferes with my treatment	400	26	144	112	118	2.8	0.94	
12	Worrying too much that I am on medication make me not to be consistent with treatment	400	36	30	150	184	3.21	0.93	
13	Thinking that medication do not help my condition	400	51	86	122	141	2.88	1.03	
14	Not being able to control worrying affect my interest in continuing with treatment	400	57	51	170	122	2.89	1	
15	Restlessness affects my daily medication	400	42	86	172	120	2.93	0.94	
16	Feeling afraid that something awful might happen affect my treatment	400	33	56	154	157	3.09	0.93	
17	Having trouble relaxing make me forget my dictation	400	65	70	172	93	2.73	0.99	
	Cluster Mean and Standard Deviation		**44**	**73**	**150**	**133**	**2.93**	**0.97**	

Note:*4 = Always, 3 = Sometimes, 2 = Rarely and 1 = Never*

Table 2 shows the mean scores and standard deviation of items 11-17 with a cluster mean of 2.93 and a standard deviation of 0.97. The cluster mean of 2.93 is above cut-off mean point of 2,50, which entails that respondents have accepted with all the items on table 3. This result implies that outcome expectation (anxiety) has negative influence on adherence to antiretroviral therapy among people living with HIV/AIDS in Benue State.

Table 3: **Chi-square Analysis on the Influence of Outcome Expectationon Adherence to Antiretroviral Therapy among Persons living with HIV/AIDS in Benue State**

Responses	**Fo**	**Fe**	**Df**	x^2	***P***	**Remark**
Never	44	100.0				
Rarely	73	100.0				
Some times	150	100.0	3	74.540	0.000	Significant
Always	133	100.0				
Total	**400**					

x^2(df, 3) = 74.540, p = 0.00 < 0.05

Table 3 shows Chi-square Analysis on the Influence of Outcome Expectation on Adherence to Antiretroviral Therapy among Persons living with HIV/AIDS.The chi-square statistic reported is 74.540. Since the p value is less than the alpha value of 0.05 the null hypothesis is rejected. This implies that outcome expectation has a negative significant influence on adherence to antiretroviral therapy among people living with HIV/AIDS in Benue State.

Discussion

The findings on influence of self -efficacy on adherence to ART revealed that self- efficacy has significant positive influence on adherence to antiretroviral therapy among persons living with HIV/AIDS in Benue state. This finding means that people living with HIV/AIDS because they stick to their treatment plan and treatment schedule, they also integrate their treatment plan and medication into their daily routine any obstruction not withstanding (x^2(df, 3) = 75.760, p = 0.00 < 0.05), Study respondents accepted all the items on table 2 with cluster mean (x) = 2.99±0.99 (SD) above cut-off point = 2.50 which revealed that self-efficacy has positive influence on adherence to antiretroviral therapy among people living with HIV/AIDS in Benue State. This work agrees with a study conducted here in Abuja and Jos Nigeria by Onibukun et al., 2021 and Damulak et al. (2021) which highlighted that higher levels of self-efficacy were associated with better adherence to ART among HIV-positive patients (Onibukun et al., 2021; Damulaket al., 2021). Similarly, research in Uganda by Kiwanuka and his colleagues found that patients with strong self-efficacy were more likely to adhere to their ART regimen (Kiwanuka et al., 2022). Also in a study in the United States, it was observed that self-efficacy positively influenced medication adherence among people living with HIV (PLHIV) (Johnson et al., 2020). Furthermore, in South Africa found that self-efficacy significantly predicted ART adherence among HIV-positive individuals (Gonzalez et al., 2011). Similarly, research conducted in the United States reported that self-efficacy was a strong predictor of medication adherence in HIV patients (Johnson et al., 2007). Another study in Uganda demonstrated that enhancing self-efficacy through targeted interventions improved ART adherence rates (Kellerman et al., 2013).

The study also revealed that outcome expectation (anxiety) has a significant influence on adherence to antiretroviral therapy as most of the respondents. (x^2(df, 3) = 74.540, p = 0.00 < 0.05), Study respondents accepted all the items on table 4 with cluster mean (x) = 2.93±0.97 (SD) above cut-off point = 2.50, revealing that outcome expectation (anxiety) has negative influence on adherence to antiretroviral therapy among people living with HIV/AIDS in

Benue. My study agrees with the study conducted in Kenya, anxiety was found to negatively impact adherence among HIV-positive individuals (Otieno et al., 2021). Research in India also demonstrated that higher anxiety levels were associated with lower ART adherence (Kumar et al., 2022). Similarly, a study in the United States confirmed that anxiety symptoms could lead to poorer adherence to ART (Gonzalez et al., 2020). In a study conducted in Nigeria, anxiety symptoms were found to be a significant predictor of non-adherence to ART (Okonkwo et al., 2020). Research in the United States indicated that anxiety was associated with lower adherence rates among HIV-positive individuals (Safren et al., 2001). In Ethiopia, a study identified that anxiety disorders were linked to poor ART adherence, emphasizing the need for mental health support in HIV care (Berhe & Bayray, 2013).

Conclusion

Based on the findings from the research questions of this study the following conclusions are drawn: Self-efficacy has a significant positive influence on adherence to antiretroviral therapy among people living with HIV/AIDS in Benue State. Outcome expectation (anxiety) has a significant negative influence on adherence to antiretroviral therapy among people living with HIV/AIDS in Benue State.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Interventions aimed at boosting self-efficacy should be implemented among people living with HIV/AIDS. This can include counseling, peer support groups, and skills training that empower patients to manage their health effectively and adhere to their treatment plans.Since self-efficacy has a significant positive influence on ART adherence, strengthening patients' belief in their ability to adhere to treatment can improve overall adherence rates.
2. Psychological support services, including cognitive-behavioral therapy (CBT) and stress management programs should be provided, to help patients manage anxiety and reduce negative outcome expectations related to ART.Given that anxiety negatively impacts ART adherence, addressing these concerns can lead to better adherence and health outcomes.

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