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Assessment of the Influence of Adolescent-Youth Friendly Health Services on HIV-related Quality of Life (AYLHIV) in Taraba State, Nigeria

Dadi Aisha Nantim[1, 4, 8*], Adegbenro Caleb Aderemi[2], Bako Ali Istifanus[3], Eruchalu Kene[4], Anyanti Jennifer[4], Idogho Omokhudu[4], Dadi Nantim Mullah[5], John-Dada Ima[6], Arije Olujide[7], Jimoh Abdulazeez[8]

[1]*School of Public Health, Texila American University, George Town, Guyana*
[2]*Public Health Programme, College of Health Sciences, Bowen University, Iwo, Osun State, Nigeria*
[3]*Taraba State AIDS Control Agency, Jalingo, Taraba State, Nigeria*
[4]*Society for Family Health, Abuja, Nigeria*
[5]*National Agency for Food and Drug Administration and Control, Kaduna State, Nigeria*
[6]*National HIV/AIDS Viral Hepatitis and STIs Control Programme, Abuja, Nigeria*
[7]*Institute of Public Health, Obafemi Awolowo University, Ile Ife, Osun State Nigeria*
[8]*Department of Human Physiology, Faculty of Basic Medical Sciences, College of Medicine, Ahmadu bello University, Zaria, Nigeria*

Abstract

Adolescents and youth living with HIV (AYLHIV) face unique challenges impacting their mental, emotional, and social well-being. In Nigeria, where youth-friendly healthcare services are evolving, the true influence of Adolescent and Youth-Friendly Health Services (AYFHS) on HIV-related quality of life (HRQoL) remains unclear. This study assessed the impact of AYFHS on the HRQoL of AYLHIV in Taraba State, Nigeria. Informed consent was obtained from all participants. A cross-sectional comparative study was conducted among 386 AYLHIV aged 10–24 years, comprising 193 AYFHS attendees and 193 non-attendees using a multistage sampling method. Data were collected via a structured, interviewer-administered questionnaire covering Anti-retro-viral therapy (ART) adherence, stigma, resilience, and overall quality of life. Analyses were performed using SPSS version 27, with t-tests and multiple regressions applied to determine group differences. Findings revealed that AYFHS attendees had significantly better ART adherence (78% vs. 62%), higher resilience (81% vs. 54%), and greater confidence in managing HIV in AYLHIV attendees. The AYLHIV attendees were also more hopeful about the future and less likely to feel ashamed of their status. Enhanced social support, peer-engagement, and provider friendliness were key contributing factors. Non-attendees reported greater emotional distress and lower treatment confidence. These results demonstrate that AYFHS attendees significantly improve HIV-related quality of life among adolescents. In conclusion, expanding youth-friendly models maybe essential for improving treatment outcomes and addressing psycho-social needs, contributing to Nigeria's progress toward achieving UNAIDS 95-95-95 goals.

Keywords*: Adolescents, ART Adherence, HIV, Mental Health, Quality of Life, Youth-Friendly Health Services.*

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****Corresponding Author: nantimaisha@gmail.com***

Introduction

Human Immunodeficiency Virus (HIV) infection remains a chronic communicable disease of significant global public health concern [1]. While early HIV responses emphasised adult treatment and prevention of vertical transmission, the specific needs of adolescents and young people living with HIV (AYLHIV) have received comparatively less attention [2]. This age group experiences heightened vulnerability, rapid disease progression, and poor clinical outcomes, including reduced ART adherence, increased stigma, and poor retention in care [3, 4]. Addressing this gap requires targeted approaches that consider their distinct social, emotional, and developmental needs.

One of the most promising involvements is the Adolescent and Youth-Friendly Health Services (AYFHS) mock-up, which many nations, including resource-constrained countries like Nigeria, have chosen to provide comprehensive, accessible, and non-judgmental HIV services. AYFHS focuses on building trust, offering psychosocial support, and tailoring health communication for youth populations [5]. Evidence from global and African contexts demonstrates that AYFHS significantly improves ART adherence, reduces emotional distress, and enhances quality of life among AYLHIV [6, 7]. Thus, AYFHS is considered one of the most effective strategies for improving care and outcomes among HIV-positive adolescents and youth.

In the face of the recognised benefits of AYFHS, several limitations hinder its full practice. Many young people still face stigma, poverty, low access to education, and health system weaknesses that prevent them from actualizing available services effectively [8]. The disparity in HIV treatment is glaringly 52% of HIV-infected children globally receive treatment, compared to 76% of infected adults [9]. These gradients persist across the entire care continuum, from diagnosis to retention, and are particularly pronounced in underserved regions like North-East Nigeria.

Be that as it may, progress is evident. The Paediatric Breakthrough Partnership (PBP) project, funded by ViiV Healthcare Positive Action, brought partners together across their respective fields of expertise to implement paediatric and adolescent projects in Nigeria and four other African countries: Uganda, Mozambique, Tanzania, and Cameroon. The partners involved in this implementation are Aidsfonds, Elizabeth Glaser Paediatric AIDS Foundation (EGPAF), Paediatric-Adolescent Treatment Africa (PATA), and UNICEF, with Society for Family Health (SFH) as Aidsfonds' implementer in Nigeria. The project implementation is in Taraba and Rivers States in Nigeria, with one of its objectives to expand youth-friendly care access that will promote access to health care, which will improve health outcomes for adolescents living with HIV. These initiatives have contributed to increased ART adherence and engagement in care among AYLHIV, particularly among those enrolled in peer-led support models such as OTZ (Operation Triple Zero). These efforts reflect a growing commitment to improving the physical, mental, and social well-being of this liable group.

This study, therefore, aims to assess the influence of Adolescent and Youth-Friendly Health Services on the health-related quality of life of adolescents and young people living with HIV in Taraba State, Nigeria. Specifically, it evaluates and compares mental health and emotional well-being, healthy lifestyle choices, including physical activity and nutrition and social relationships between AYFHS users and non-users.

This study thoroughly focuses on health-related quality of life as an effect scrutinizing how structured AYFHS programs affect various dimensions of life quality among HIV positive adolescents and young adults. Additionally, focuses on low resource, high burden state like Taraba, Nigeria.

Materials and Methods

Description of the Study Area

Taraba State is an Island state in the Northeast Geopolitical Zone of Nigeria. The State lies on Latitude: 8.0° N - 10.0° N and longitude 9.0° E - 12.0° E. It covers an area of approximately 54,473 square kilometres, making it one of Nigeria's largest states. The state shares edge with Bauchi State to the north, Gombe State to the northeast, Adamawa State to the east, and Benue and Nasarawa states to the west. Taraba State is divided into three senatorial districts which covers 16 Local Government Areas, namely, Ardo Kola, Bali, Donga, Gashaka, Gassol, Ibi, Jalingo, Karim Lamido, Kurmi, Lau, Sardauna, Takum, Ussa, Wukari, Yorro and Zing. The study population were drawn from five LGAs; Wukari, Jalingo, Kurmi, Sardauna, Gashaka. According to the 2006 censusin Nigeria, Taraba State had a population of 2,294,800 million people. The estimated population of the State was 3,609,800 [10]. The population comprised 51.1% male and 48.9% female. The people are largely farmers, traders and civil servants. Taraba State has the 4th largest population of people living with HIV in Nigeria, with a frequency rate of 2.7% [11].

Study Design

This study employed a comparative cross-sectional design to assess differences in health-related quality of life (HRQoL) among adolescents and young people living with HIV (AYLHIV) based on their use of Adolescent and Youth-Friendly Health Services (AYFHS). Data was collected at a single point to compare AYFHS attendees and non-attendees. A multistage sampling method was employed to select participants from AYFHS and non-AYFHS facilities across Taraba State. Quantitative data were gathered using a structured, interviewer-administered questionnaire AYLHIVQOLQ covering ART adherence, mental and emotional well-being, lifestyle, and social relationships.

This study employed also used a qualitative approach, utilizing purposive sampling to select participants for in-depth interviews (IDIs) and focus group discussions (FGDs). A total of six participants were selected for the IDIs, while 14 participants were divided into two FGD groups, each consisting of seven participants. Semi-structured interview guides were used to facilitate both the IDIs and FGDs, allowing for in-depth exploration of the research topic.

The interviews were conducted in a private setting to ensure participant comfort and confidentiality. All interviews were audio-recorded and subsequently transcribed verbatim to ensure accuracy. Thematic coding was employed to identify themes and patterns in the data, enabling the researcher to draw meaningful conclusions.

To ensure the consistency and validity of the findings, data triangulation was conducted, combining insights from both the IDIs and FGDs. This approach allowed for a comprehensive understanding of the research topic, enhancing the reliability and credibility of the study's findings. In-depth interviews (IDI) were conducted to triangulate the quantitative analysis, providing qualitative data insights. The tool underwent expert validation and pilot testing.

Population of the Study

The study inhabitants consisted of all adolescents and young adults between the ages of 10 and 24 living with HIV in Taraba State. According to available data as at September 2024, by Data for Implementation (Data.FI) [12], a global initiative that support countries in strengthening their health information systems, stated that Taraba State, Nigeria has an estimated 2,598 adolescents living with HIV aged 10-24 who are aware of their status and on ART in Paediatrics Breakthrough Partnership supported facilities whether attending Adolescent and young people health friendly

services or not. Out of these numbers, 4 years of age, 157 females and 149 males, children aged 5 to 9 were (271 females and 321 males), 393 females and 424 males were between the ages of 10 and 14 years, and those aged 15 to 19 were (539 females and 344 males).

Inclusion Criteria

The inclusion criteria for this study prioritise adolescents and young people aged 10 to 24 years who had been diagnosed with HIV and were currently receiving antiretroviral therapy (ART). Participants were eligible if they were aware of their HIV-positive status and were receiving care either at Adolescent-Youth Friendly Health Services (AYFHS) facilities or non-AYFHS facilities within Taraba State, North-East Nigeria. Informed consent or assent was required from all participants or their caregivers, ensuring ethical compliance and voluntary involvement.

Exclusion Criteria

Subjects were excluded from the study if they did not fall within the specified age range of 10 to 24 years, had not been diagnosed with HIV, or were unaware of their HIV status. Those who were not on ART at the time of data collection or who declined to provide consent or assent were also excluded. These criteria were carefully designed to ensure the study population was representative of adolescents and young people living with HIV, thereby allowing for a precise assessment of the perceived quality of life among those attending AYFHS compared to their counterparts in non-AYFHS settings.

Sample Size Determination

The sample size was determined using the two-sample proportion comparison formula, which is applicable to comparing independent groups. Proportions were derived from Ulunta sampling formula [13], which showed that 92% of adolescents in OTZ Clubs achieved viral suppression, while we postulate that this proportion will be at least 10 percentage points smaller for those not in such support groups. Using the same size for comparing proportions as follows.

$$\text{N per group} = \frac{2 \times \left(Z_{\alpha} + Z_{\beta}\right)^2 \times p(1-p)}{(p_1 - p_2)^2}$$

Assuming a 95% confidence level and power of 80%, the sample size calculation per group is,

$$\text{N per group} = \frac{2 \times (1.96 + 0.84)^2 \times 0.87(1.0.87)}{(0.92\_0.82)^2}$$

This gives a sample size of per group of 174, 192 per group after adding 10% non-response, and a total sample size of 386 for the two groups.

Sampling Techniques

A multistage sampling technique was employed in this study. The population was categorized into two groups: AYPLHIV attending Adolescent and Youth-Friendly Health Services (AYFHS) in PBP-supported facilities, and those not attending AYFHS in non-PBP-supported facilities. Simple random sampling was used to select six facilities from each group. Within each facility, systematic random sampling was applied to select 193 participants per group. The first participant was chosen through balloting, and subsequent participants were selected at every nth interval. If a selected individual declined, the next available willing participant was included. Qualitative data were collected using semi structured interview and FGD guides. One-on-one interviews and FGDs explored participants' experiences and perceptions. FGDs were moderated by the researcher, with a research assistant as a note taker. Observation techniques were also used to assess the facility environment and staff-client interactions. All interviews and FGDs were audio recorded and transcribed verbatim. Data was analyzed using thematic analysis to identify recurring patterns and themes, providing deeper insight into the

quality of life and service experiences of AYPLHIV.

Data Collection

The data compilation techniques for quantitative data were the questionnaire titled "Adolescent-Youth Living with HIV Quality of Life Questionnaire" (AYLHIVQOLQ). The questionnaire contained both open and closed-ended questions in line with the objectives of the study. The questionnaire information was labelled A-F. Section "A", termed socio-demographic characteristics, had 12 items, including AYA gender, age, education level, marital status, occupation, parental education, duration of HIV diagnosis, Household income, etc. Section "B, C D, E, and F" all had 10 items each bothering on specific research objectives and other meaningful issues relevant to the study.

Data Analysis

Quantitative data were predetermined during pilot testing for consistency and transformed into numeric codes for analysis. Descriptive statistics (frequencies and percentages) summarized demographic variables such as age, gender, and AYFHS attendance. Inferential statistics, including independent t-tests and regression analysis, examined relationships and group differences, using a 0.05 alpha level. All analyses were conducted using SPSS version 27, with results presented through tables and charts. Qualitative data from in-depth interviews and focus group discussions were transcribed verbatim. Thematic and content analyses were applied to identify recurring patterns and meaningful themes. Observational data were reviewed through field notes, focusing on physical settings and provider-client engagement.

Results

Table 1 provides a comprehensive outline of the characteristics of the study population. The gender distribution of the respondents indicates a slightly higher proportion of females (60%) compared to males (40%). This disparity reflects the general trend of females being more likely to access healthcare services, particularly in the context of HIV/AIDS. The age distribution of the respondents shows a relatively even spread across the adolescent and young adult age groups, with 25% in the 10-14 age range, 39% in the 15-19 age range, and 36% in the 20-24 age range. This distribution highlights the importance of tailoring healthcare services to meet the unique needs of different age groups within the adolescent and young adult population. The respondents' educational levels varied, with 23% having completed primary education, 41% having completed secondary education, and 18% having completed tertiary education. A small proportion (17%) of respondents had no formal education. This distribution highlights the need for healthcare services to be accessible and understandable to individuals with varying levels of education. The respondents' occupations were diverse, with 26% engaged in trading, 34% working as artisans, and 40% students. This distribution reflects the economic realities of many young people in the study population, with many engaged in informal sector activities or still in school. The living arrangements of the respondents showed that 41% lived with their biological parents, 29% lived with relatives, and 30% lived with others. This distribution highlights the importance of considering the social support networks of adolescents and young adults living with HIV.

Table 1. Socio-Demographic Information of Respondents

Items	Variables	Frequency	Percentage (%)
Gender	Male	155	40
	Female	231	60
Age	10-14 years	97	25
	15-19 years	152	39
	20-24	137	36
Educational Level	Primary	89	23
	Secondary	157	41
	Tertiary	76	18
	None	16	17
AYA Occupation	Trading	102	26
	Artisan	130	34
	Student	154	40
Who do you live with	Biological Parent	157	41
	Relatives	112	29
	Others	117	30
How long have you been on ART?	1-5 years	176	46
	6-10 years	167	43
	11years & above	43	11

The interval of antiretroviral therapy (ART) among respondents varied, with 46% having been on treatment for 1-5 years, 43% for 6-10 years, and 11% for 11 years or more. This distribution highlights the need for ongoing support and care for individuals living with HIV, particularly as they transition from pediatric to adult care.

Table 2 presents a comparison of mental health and emotional well-being outcomes between adolescents and young adults (AYAs) attending Adolescent and Young Adults Health Friendly Services (AYFHS) and a comparison group. The findings suggest that AYAs attending AYFHS tend to have better mental health and emotional well-being outcomes compared to those not attending AYFHS.

In terms of internalised stigma, AYAs attending AYFHS reported lower levels of shame associated with their HIV status. Specifically, 57% of AYAs attending AYFHS strongly disagreed with feeling ashamed, compared to 8% in the comparison group. This suggests that AYFHS may play a role in reducing internalised stigma among AYAs living with HIV.

The findings also indicate that AYA attending AYFHS demonstrated higher levels of resilience and coping. For instance, 75% of AYA attending AYFHS agreed or strongly agreed that they can handle emotional challenges, compared to 38% in the comparison group. This suggests that AYFHS may be effective in promoting resilience and coping skills among AYAs living with HIV.

Furthermore, AYAs attending AYFHS reported higher levels of hope for their future, with 95% agreeing or strongly agreeing that they are hopeful despite living with HIV, compared to 60% in the comparison group. This finding highlights the potential of AYFHS to promote a positive outlook and hope for the future among AYA living with HIV.

In addition, AYAs attending AYFHS demonstrated higher levels of confidence in managing their HIV treatment, with 98% agreeing or strongly agreeing that they are confident, compared to 57% in the comparison

group. This suggests that AYFHS may be effective in promoting self-efficacy and treatment adherence among AYA living with HIV.

Table 2. Frequency Table of Mental Health and Emotional Well-being Among Adolescents and Young Adults Attending AYFHS and the Comparison Group in Taraba

Items	**Variables**	**Percentage (%) among AYAs attending AYFHS (N=193)**	**Percentage (%) among AYAs attending AYFHS (N=193)**
Internalized stigma			
I have often felt ashamed of my HIV status	Strongly disagree	57	8
	Disagree	31	14
	Neutral	5	10
	Agree	5	23
	Strongly agree	2	45
Resilience and coping			
I am able to handle the emotional challenges of living with HIV	Strongly disagree	5	7
	Disagree	20	40
	Neutral	0	15
	Agree	45	22
	Strongly agree	30	16
Hope and optimism			
I am hopeful about my future despite living with HIV	Strongly disagree	0	26
	Disagree	5	8
	Neutral	0	6
	Agree	28	17
	Strongly agree	67	43
Self-Efficacy			
I am confident in my ability to manage my HIV treatment	Strongly disagree	0	5
	Disagree	0	25
	Neutral	2	13
	Agree	72	24
	Strongly agree	26	33

In one of the interviewees' opinions:

> *Managing one's HIV requires eating a balanced diet, adherence to ART, and maintaining physical, emotional and spiritual health. This is because HIV viral load is largely affected by one's state of mind, behavioural disposition and diet.*

Another interviewee (Civil Servant), who happened to be a caregiver to one of the adolescents on treatment, said:

> *I encourage my child not to miss AYFHS and to always take her medication as prescribed. Attending AYHFS has made me have a better perspective of life.*

Figure 1 highlights the importance of Adolescent and Young People Health Friendly Services (AYFHS) in promoting healthy lifestyles and habits among Adolescents and Youth Living with HIV (AYLHIV). The significantly higher adherence percentage (96%) among AYLHIV attending AYFHS

compared to the comparison group (74%) underscores the effectiveness of AYFHS in supporting treatment adherence. This finding is consistent with previous research highlighting the importance of comprehensive care models in improving treatment outcomes among people living with HIV [14]. The AYFHS model may be providing tailored support, education, and counseling that enables AYLHIV to better manage their condition and adhere to treatment regimens. The slightly higher adherence percentage to balanced diet habits among AYLHIV attending AYFHS (80%) compared to the comparison group (78%) suggests that AYFHS may be having a positive impact on nutrition-related behaviors. However, the difference is not substantial and both groups still have room for improvement. Nutrition counseling and education are essential components of comprehensive care for people living with HIV and AYFHS may need to strengthen these aspects to have a more significant impact [15]. The similarity in physical exercise habits between the two groups (70%) suggests that AYFHS may not be having a significant impact on this aspect of healthy lifestyle. Physical activity is essential for overall health and well-being, particularly for people living with HIV [16]. AYFHS may need to prioritize physical activity promotion and provide accessible exercise programs tailored to the needs of AYLHIV.

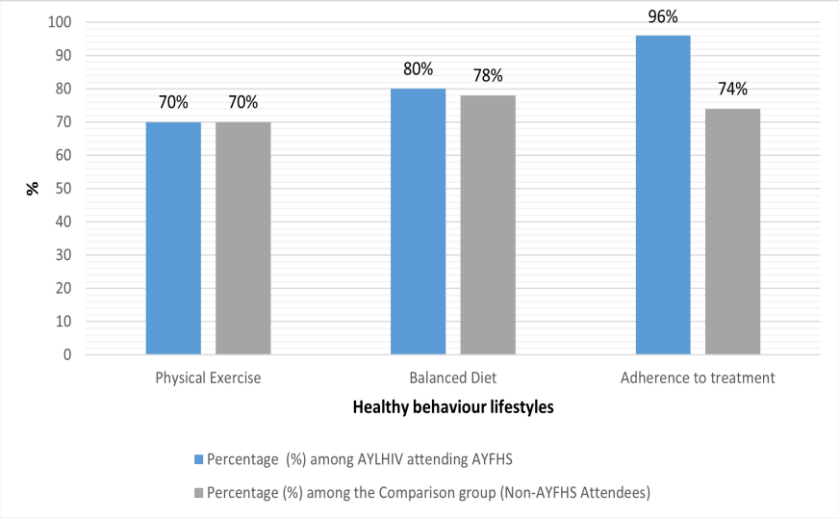

Figure 1. Adherence to Healthy Behavior and Lifestyle among Adolescent and Young Adult Attending AYFHS and the Comparison Group in Taraba State, Nigeria

Another respondent (male, 17years) narrated that:

We are 10 in the family, and we hardly ate balanced diet coupled with the current economy in Nigeria. This affected my ART adherence, and viral load. But through the AYFHS I have learnt how to make balanced meal from locally available recipe. This has helped improved my physical health.

According to another respondent (male), he said that:

I don't attend the AYFHS support group, but I learnt the importance of physical exercise to reduce stress and fatigue during clinic appointment. I can say that I have seen massive improvement in my health ever since.

Table 3 The table presents findings on social support and adherence among adolescents and young adults living with HIV (AYALHIV) attending Adolescent and Young Adults Health Friendly Services (AYFHS) and a comparison group. The results highlight the importance of social support in medication adherence, with both groups relying heavily on family members to remember their medication. Specifically, 55% of AYFHS attendees and 56% of the

comparison group cited family support as a key factor.

In addition to family support, both groups also utilize mobile apps and reminders to aid adherence, with 33% of AYFHS attendees and 34% of the comparison group using these tools. Notably, all AYFHS attendees reported receiving counseling or support to help them adhere to their treatment, compared to 85% of the comparison group. Furthermore, AYFHS attendees reported higher satisfaction with the counseling and support they received, with 93% finding it "very helpful" compared to 89% of the comparison group.

The findings also suggest that AYFHS attendees may be less likely to experience adherence challenges, with 13% requiring enhanced adherence counseling compared to 19% of the comparison group. Overall, the results highlight the importance of comprehensive support services, including counseling and family involvement, in promoting treatment adherence and overall well-being among AYALHIV.

The implications of these findings are significant, suggesting that tailored interventions that address adherence challenges and promote social support can have a positive impact on outcomes among AYALHIV.

Table 3. Social Relationship Among AYALHIV Adolescent Who Attend AYFHS and the Comparison Group in Taraba

Items	**Variables**	**Percentage (%) among AYA attending AYFHS (N=193)**	**Percentage (%) among AYA attending AYFHS (N=193)**
Social support and adherence			
Who helps you remember to take your medication?	Family member	55	56
	Friend	2	0
	Healthcare provider	2	0
	Mobile app or reminder	33	34
	Other (please specify)	8	10
Counselling and support			
Have you ever received counseling or support to help you adhere to your treatment?	Yes	100	85
	No	0	15
Effectiveness of support			
If yes, how helpful was this support	Very helpful	93	89
	Not very helpful	3	11
	Not at all helpful	0	0
Adherence challenges			
Have you ever been placed on enhanced adherence counselling due to poor adherence to your treatment plan?	Yes	13	19
	No	87	81

A comparison of the findings between the two groups reveals that while family members are a crucial source of support for both groups, AYFHS attendees are more likely to use mobile apps and alarm clocks as reminders and find the support they receive to be more helpful. Non-attendees, on the other hand, are more likely to rely on prayer time & meals as reminders.

In an interview with a female interviewee receiving treatment at Zing General Hospital, she said:

> *I wasn't born with HIV but contracted it due to a careless lifestyle. At first, I was so depressed and felt like committing suicide but with the encouragement of my parent especially my father, I now have suppressed viral load adhering to my ART regimen. and I have been seeing improvement.*

Hypothesis Testing: Inferential Statistics

Table 4 The table presents the results of a linear regression analysis examining the relationship between attendance at Adolescent and Young Adults Health Friendly Services (AYFHS) and mental health and emotional well-being among adolescents and young adults in Taraba State, Nigeria. The results indicate a significant positive relationship between AYFHS attendance and mental health and emotional well-being (B = 2.51, SE = 0.67, β = 0.35, t = 3.98, p < .001). The 95% confidence interval (1.20, 3.82) suggests that the true effect size is likely to be between 1.20 and 3.82. In contrast, the results also indicate a significant positive relationship between non-AYFHS attendance and mental health and emotional well-being (B = 1.82, SE = 0.41, β = 0.29, t = 3.56, p < .001). However, the effect size is smaller compared to AYFHS attendance. The 95% confidence interval (1.02, 2.62) suggests that the true effect size is likely to be between 1.02 and 2.62. The coefficient of determination (R2) values for AYFHS attendance and non-AYFHS attendance are 0.26 and 0.33, respectively. This indicates that approximately 26% and 33% of the variance in mental health and emotional well-being can be explained by the predictors in the model. The F-statistics (15.81 and 12.69) further support the significance of the models. Overall, the findings suggest that attending AYFHS is associated with better mental health and emotional well-being outcomes among adolescents and young adults.

Table 4. Linear Regression Analysis of Mental Health and Emotional Well-being Among Adolescent and Young Adult Attending AYFHS and the Comparison Group in Taraba State, Nigeria

Predictor	B	SE	B	t	P	R2	F	Cl
AYFHS Attendance	2.51	0.67	0.35	3.98	< .001	0.26	15.81	95%(1.20, 3.82)
Non-AYFHS Attendance	1.82	0.41	0.29	3.56	< .001	0.33	12.69	95%(1.02, 2.62)

P< .001, df=384, M=mean, SD=Standard deviation, R2: coefficient of determination. β=standardized regression coefficient, AYFHS Attendance: 0 = non-attendees, 1 = attendees, N=386, an=193, bn=193

Table 5 The table presents the mean difference in adherence to healthy behavior and lifestyle between adolescents and young adults attending Adolescent and Young Adults Health Friendly Services (AYFHS) and those not attending AYFHS in Taraba State, Nigeria. The findings revealed significant differences in adherence to healthy behavior and lifestyle between the two groups. Specifically, AYFHS attendees reported a higher mean score for healthy behavior (M = 5.05, SD = 5.65) compared to non-attendees (M = 4.65, SD = 5.43), with a statistically significant mean difference (t (384) = 2.03, p = 0.005). The Cohen's d value of 0.20 suggests a small effect size. Similarly, AYFHS attendees reported a higher mean score for Health-Related Quality of Life (HRQoL) (M = 3.89, SD = 2.96)

compared to non-attendees (M = 3.07, SD = 1.70), with a statistically significant mean difference (t (384) = 2.09, p = 0.006). The Cohen's d value of 0.28 suggests a small to medium effect size. These findings suggest that AYFHS may be effective in promoting positive health outcomes among adolescents and young adults.

Table 5. Mean Difference of Adherence to Healthy Behaviour and Lifestyle Among Adolescent and Young Adult Attending AYFHS and the Comparison Group in Taraba State, Nigeria

	On AYHFS		**Not on AYHFS**					
Variable	M	SD	M	SD	t(384)	P	R	Cohen's d
Healthy behaviour	5.05	5.65	4.65	5.43	2.03	.005	0.32	0.20
HRQoL	3.89	2.96	3.07	1.70	2.09	.006	0.36	0.28

**P<0.05, df=384, M=mean, SD=Standard deviation, R=Beta coefficient, N=386, an=193, bn=193*

Table 6: The table presents the mean difference in social relationship and Health-Related Quality of Life (HRQoL) among Adolescents and Young Adults Living with HIV (AYALHIV) attending Adolescent and Young Adults Health Friendly Services (AYFHS) and those not attending AYFHS in Taraba. The results indicate a significant difference in social relationship between AYFHS attendees (M = 14.05, SD = 7.05) and non-attendees (M = 11.48, SD = 5.47), with a t-value of 6.53 and a p-value of < .000. The Cohen's d value of 0.56 suggests a moderate effect size, indicating that AYFHS attendees tend to have better social relationships compared to non-attendees. The Beta coefficient (R = 0.622) indicates a strong positive relationship between AYFHS attendance and social relationships. In contrast, the results for HRQoL indicate a significant difference between AYFHS attendees (M = 22.07, SD = 10.83) and non-attendees (M = 13.50, SD = 5.96), with a t-value of 5.09 and a p-value of < .000. The Beta coefficient (R = 0.56) indicates a strong positive relationship between AYFHS attendance and HRQoL, suggesting that AYFHS attendance is associated with higher HRQoL scores. The Cohen's d value of 0.80 suggests a large effect size. The positive Beta coefficient for HRQoL (R = 0.56) suggests that as AYFHS attendance increases, HRQoL scores also tend to increase. This indicates that AYFHS attendance positively impacts HRQoL among AYALHIV. The strong positive relationship between AYFHS attendance and both social relationships and HRQoL suggests that AYFHS is an effective intervention for promoting the well-being of AYALHIV. Overall, the findings suggest that AYFHS attendees tend to have better social relationships and higher HRQoL scores compared to non-attendees. These results highlight the potential benefits of AYFHS attendance for AYALHIV, particularly in terms of social relationships and overall well-being.

Table 6. Mean Difference of Social Relationship Among AYALHIV Adolescent Who Attend AYFHS and the Comparison Group in Taraba

	Not-On AYHFS		**On AYHFS**					
Variable	M	SD	M	SD	t (384)	P	R	Cohen's d
Social relationship	14.05	7.05	11.48	5.47	6.53	.000	0.622	0.56
HRQoL	13.50	5.96	22.07	10.83	5.09	.000	0.56	0.80

**P<0.001, df=384, M=mean, SD=Standard deviation, R=Beta coefficient N=386, an=193, bn=193*

Discussion

This study assesses and compares the mental health and emotional well-being of Adolescents and Young People Living with HIV (AYLHIV) who attend Adolescent and Youth-Friendly Health Services (AYFHS) with those who do not, in Taraba State, Nigeria. It also evaluates the extent to which AYLHIV adopt healthy lifestyle choices particularly regular physical exercise and balanced nutrition. Furthermore, the study explores the level of social relationships and support among AYFHS attendees versus their counterparts in the comparison group.

The study found a significant positive relationship between AYFHS attendance and mental health and emotional well-being (B = 2.51, SE = 0.67, β = 0.35, t = 3.98, p < .001), with a 95% confidence interval of 1.20 to 3.82. In contrast, non-AYFHS attendance also had a significant positive relationship with mental health and emotional well-being (B = 1.82, SE = 0.41, β = 0.29, t = 3.56, p < .001), with a 95% confidence interval of 1.02 to 2.62. The R-squared values indicate that 26% (R2 = 0.26) and 33% (R2 = 0.33) of the variance in mental health and emotional well-being can be explained by AYFHS attendance and non-AYFHS attendance, respectively. The F-statistics (15.81 and 12.69) support the significance of the models. Overall, attending AYFHS is associated with better mental health and emotional well-being outcomes. This finding is consistent with previous studies that have shown the benefits of specialized youth-friendly settings in reducing stigma and improving mental health outcomes among AYLHIV [17].

The study also found significant differences in adherence to healthy behavior and lifestyle among adolescents and young adults attending Adolescent Youth-Friendly Health Services (AYFHS) compared to non-attendees. AYFHS attendees had higher mean scores for healthy behavior (M = 5.05, SD = 5.65) compared to non-attendees (M = 4.65, SD = 5.43), with a statistically significant mean difference (t (384) = 2.03, p = 0.005) and a small effect size (Cohen's d = 0.20). Additionally, AYFHS attendees reported higher mean scores for Health-Related Quality of Life (HRQoL) (M = 3.89, SD = 2.96) compared to non-attendees (M = 3.07, SD = 1.70), with a statistically significant mean difference (t(384) = 2.09, p = 0.006) and a small to medium effect size (Cohen's d = 0.28). The finding is in accordance with that of [18], who demonstrated that youth-friendly environments are associated with significantly improved promote physical exercise and balance diet essential for boosting the immune system, the management of HIV and the overall well-being of the adolescent. Furthermore, [19], postulated that the integration of peer support, targeted counselling, and a non-judgmental service atmosphere can markedly enhance treatment compliance. Also, this result is in line with the findings of [20], they reported an overall viral suppression load of 92.4% in the OTZ group of AYALHIV and 84.3% in the regular ART group among AYALHIV in Addis Ababa, Ethiopia, indicating that OTZ had 8.1% times greater chance of suppressing HIV viral load.

In this study, the independent sample t -test for Hypothesis revealed that at 384 degree of freedom reveals that AYFHS attendees had better social relationships (M = 14.05, SD = 7.05) compared to non-attendees (M = 11.48, SD = 5.47), with a significant difference (t = 6.53, p < .000) and a moderate effect size (Cohen's d = 0.56). AYFHS attendance was strongly positively related to social relationships (R = 0.622). Additionally, attendees had higher HRQoL scores (M = 22.07, SD = 10.83) compared to non-attendees (M = 13.50, SD = 5.96), with a significant difference (t = 5.09, p < .000) and a large effect size (Cohen's d = 0.80). AYFHS attendance was also strongly positively related to HRQoL (R = 0.56). This suggests that as social relationships increase, quality of life also improves.

Our postulate is consistent with previous studies that have shown a positive relationship between HIV resilience and quality of life among people living with HIV. [21], argued that social relationships facilitate disclosure and lead to viral load suppression. A friendly, supportive and non-judgmental environment can enhance self-efficacy and promote coping strategies that are integral to resilience [22] asserted that the integration of peer support networks and psycho-social interventions within AYFHS reduces emotional burden of HIV, strengthen social connections by 70% thereby strengthening the individual's ability to manage their condition effectively.

Further research should be carried out in different location and geographical area to compare and contrast if Taraba State, Nigeria is not an exception to how adolescence and young people living with HIV respond to the challenges associated with it.

Ethical Considerations

This study was conducted with utmost regard for ethical principles. Informed consent was obtained from all participants prior to data collection. Participants were assured of confidentiality and anonymity, and their right to withdraw from the study at any point was respected. For participants under the age of 18, parental or guardian consent was obtained in addition to the adolescent's assent. All data collected was stored securely and only accessible to authorized personnel. The study protocol was approved by the relevant institutional review board or ethics committee.

Conclusion

This study features the health-related quality of life of adolescents living with HIV, comparing the health outcomes of AYLHIV who participate in Adolescent and Young Friendly Health Services (AYFHS) in PBP facilities and non-attendees. The study demonstrated that AYFHS attendance is associated with improved mental health and emotional well-being, healthy lifestyle choices, and social relationships among AYLHIV. The findings highlight the importance of specialized youth-friendly services in promoting positive health outcomes and improving the overall well-being of AYLHIV. The study's results have implications for policy, policy makers and practice, emphasizing the need to scale up AYFHS to reach more AYLHIV and improve their access to specialized care, promote healthy lifestyle choices, including physical exercise and balanced nutrition, among AYLHIV and strengthen social relationships and support networks among AYLHIV to improve their overall quality of life.

Conflict of Interest

No competing interests were declared by the authors.

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