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The Impact of Operation Triple Zero (OTZ) Initiative on Viral Load Suppression among Adolescents Living with HIV in Buruku LGA, Benue State, Nigeria

Akpe Tavershima Thomas[1*], Okwor Alexis Nnaemezie[2]

[1](RN, B.Sc. MHM, Ph.D FIHSAN)
[2](MB,BS, MSC.PH)

[*]*Corresponding Author's Email: tatakpe@yahoo.com*

Abstract

This study assessed multifaceted dynamics influencing viral load suppression of adolescents living with HIV/AIDS in the context of the operation triple zero (OTZ) initiative within the APIN-supported implementing sites in Buruku LGA. The study encompasses analysis of demographic, healthcare, and psychosocial attributes enhancing critical determinants of viral load outcomes among the vulnerable population. A quantitative data collection method was used on a 196 adolescents attending healthcare facilities in Buruku LGA who were selected through stratified random sampling. Questionnaire was used to collect data which showed 7.7% of the adolescents achieved a remarkable viral load suppression before enrollment on the programme, while 38.3% achieved suppressed viral loads after enrollment on the OTZ. Research questions were developed based on viral suppression, the impact of OTZ on viral load, social demographic factors influencing viral load suppression and healthcare workers attitude related to viral load suppression Gender-related factors, proximity to healthcare facilities, income levels and age were identified as influential determinants affecting viral loading outcomes. These findings emphasize the necessity of tailored interventions addressing the specific challenges faced by adolescents based on their gender, geographical context, socioeconomic status and age. The study advocates for celebration of achievements, recognition of caregiver's support, education and persistent progress tracking. By incorporating the insight and recommendations offered, healthcare providers and policy makers can better tailor intervention to improve viral local outcome, foster resilient communities, and enhance the overall well-being of adolescents living with HIV/ADIS.

Keywords: Viral Load, Viral Suppression, Operation Triple Zero (OTZ)

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INTRODUCTION

The HIV pandemic is most severely affecting Sub-Saharan African Nigeria which is home to two-thirds of all HIV positive people globally and 1 in every 25 adults (3.4%) with young teenagers and adolescents bearing the most of this scourge. UNICEF in 2018 stated that 1.6 million adolescents are living with HIV, with most of these having the transmission through unprotected sexual and other potentially risky behaviours. Early sexual debut, inter-generational sex and multiple/concurrent sexual partners are sexuality risky behaviours that increases the vulnerability of adolescents to HIV (UNAIDS, 2017). According to Dixon-Umo (2020), AIDs related fatalities among young people is rising while there is a 32% decline in other age groups. HIV/AIDS is now considered as the second most common cause of death among young people in the United States of American (Kapogrannis et al., 2018). This assertion can also be applicable to Nigeria, since the youths have replica social behaviours globally. Nasuuna et al. (2018) stated that results for viral suppression in children can adolescents also indicates that Antiretroviral Therapy (ART) outcomes for children and adolescents in high-and-low-income societies are often lower than in adults.

From the foregone, a support group, Operation Triple Zero (OTZ) is set up as a club which gives psychological support to encourage ART adherence and retention in care of young people living with HIV/AIDS (Schotanus-dijkstra et al., 2017). OTZ club provides young people living with HIV/AIDS with a complete and comprehensive treatment literacy bundle to equip them for future actions on HIV/AIDS treatment. Additionally they are committed in ensuring a straight forward treatment plan that aims to achieving “three Zeroes”: Zero missed health practitioner appointment, Zero missed doses of medications, and Zero viral load assessment. This program also give beneficiaries the opportunity and the chance to take care of their health generally, make informed choices and decisions, get external support and identify as well as have interactions with successful peers. This propels, motivates and give them psychosocial support required for better ART adherence and viral load suppression is guaranteed. This approach of taking care of HIV/AIDS positive individuals, and their care givers (both professionals and none-professionals) the privilege of been involved in the aspect of care including planning and implementation efforts (Akpe, 2009. This is made possible through OTZ club group meetings, where similar challenges are discussed and assistance is preferred, where necessary.

OTZ is one of the customized adolescent-focused services delivery models introduced to improve viral load suppression. This club enrolls adolescents aged 10-19 years in groups at selected health facilities where HIV care and treatment services are already given. Eight facilities in Buruku LGA of Benue State, Nigeria which houses this club are already been supported and sponsored for HIV/AIDS care by AIDS Prevention Initiative in Nigeria (APIN).

Being a new addition and conceptual approach to HIV programming, OTZ has a dearth of publicity and published studies particularly in the study setting aimed at contributing to the knowledge gap in HIV particularly and public health as a discipline generally.

The general objective of the study is to understudy the impact of OTZ initiative on viral load suppression among adolescents living with HIV in APIN supported and implementing sites in Buruku LGA, Benue State, Nigeria.

Specific objectives included:

i. To ascertain the proportion of adolescents living with HIV in Buruku LGA who were previously unsuppressed but became suppressed within 6 months of OTZ enrolment.

ii. To determine the impacts of OTZ peer influence on viral load suppression among adolescents in Buruku LGA living with HIV and enrolled with OTZ programme.

iii. To identify the socio-demographic factors influencing viral load suppression among adolescents living with HIV in Buruku LGA who were enrolled in OTZ.

iv. To assess the Healthcare worker related factors to viral suppression among adolescents of the OTZ club in Buruku LGA.

Four research questions were prompted based on the objectives. These were:

i. What is the proportion of adolescents in Buruku LGA who were previously unsuppressed but became suppressed 6 months after enrolment into OTZ?

ii. What are the impacts of OTZ peer influence on viral load suppression among adolescents in Buruku LGA?

iii. What are the socio-demographic factors influencing viral load suppression on the adolescents enrolled in OTZ in Buruku LGA?

iv. What are the healthcare workers attitude-related factors on viral suppression among adolescents of the OTZ club in Buruku LGA?

CONCEPTUAL FRAMEWORK

HIV/AIDS is a chronic and fatal pandemic which remains difficult to combat. Millions have died as a result of this widespread pandemic and a much more proportion of lives have been severely affected. Data indicates that over 35 million people have had HIV resulting to 1.7 million deaths due to AIDs related causes. Two-thirds of these have occurred in sub-Saharan Africa (UNAIDS, 2017) Nigeria has one of the highest incidences of HIV/AIDS globally, including death rate, despite the availability of simple tests and multiple support services. According to Gweguen et al (2021), the viral load has been proposed as the most reliable indicator of ARV treatment failure. It has been established that viral suppression occurs in 95% of HIV positive patients who adhered to treatment regimen. The viral load describes the level of HIV present in the body. The unit of measurement is copies of HIV per milliliter of blood. Transmission is highly unlikely when the blood viral load is < 1000 copies/ml. Nasuuna et al., (2019) however inform that in South Africa young adults and adolescents experience virologic failure rates of 8.2% and 5.0% respectively. The optimal assence of OTZ club is to encourage persistent and correct intake of antiretroviral drugs at the right time to ensure viral suppression. To peruse this, OTZ club offer a comprehence HIV treatment literacy package and empower youths living with HIV/AIDS to be self-health managers, take control of their informed decisions, receive support from peers who are doing well and follow guides to treatment as treatment personnels presents (Shotanus-dijkstra et al., 2017).

Nasuuna et al. (2018) is also of the view that the main goal of psychosocial support for youths living with HIV is based on the need for better ART adherence and viral load suppression. This

is based on the premium that adherence to ART is a key factor leading to viral load suppression while non-adherence to ART is a major cause of HIV drug resistance and subsequent immunological and clinical failure. Zanoni, Sibaya and Haberer (2019) as well as WHO (2015) impress that following support group has been shown to be a significant resource for improved adherence to ART by adolescents.

Living with HIV

There are certain living condition an individual will follow to help maintain high quality of life as they live with HIV. These are inexhaustively presented:

- Gaining knowledge about HIV disease and treatments. It is extremely helpful for HIV positive individuals to learn and comprehend all they can concerning HIV and its treatment. This can be had from health professionals, peer groups and literature consultation. Inevitably, the key to successful living with HIV/AIDS is putting information into practice perspective-meaning setting goals and collaborating with health care professionals in achieving treatment plans.

- Staying healthy – this involves getting sufficient exercise and rest, following nutritious diet i.e consuming sufficient healthy calories, protein, fats, minerals, vitamins and water. And living in a conducive environment.

- Avoidance of exposure to contagions infections – people with HIV/AIDS should avoid contacts with people who have other contagious illnesses, contagion illness, if contact is unavoidable, wear marks and wash hands during and after contacts.

- Stress, Anxiety and Psychological complication-HIV positive individuals are confronted with psychological and emotional stress, particularly at initial knowledge of their seropositive status (Darrel, 1999). Stress sources include uncertainties of HIV, concern about abandonment, loss of employment, copping with health system, expenses of drugs and health care generally. Hence stress weakens the immune system, managing stress becomes very important through counseling.

- Complementary and alternative treatments-HIV+ individuals may believe that complementary and alternative treatments will help control their infection by strengthening their immune system, protecting immune cells from HIV and slow the progression of the disease process. Imperatively, anyone who is considering trying these forms of treatment should first investigate it carefully-Beware of the obnoxious claim that the treatment is a “CURE” or will have miraculous effects.

- New Therapies allow people with HIV/AIDS to live longer and even better- Until recently HIV/AIDS was taken as a “death sentence”. This concept has totally changed now a there are potent medications, improved medical care generally, better use of prophylaxis and treatments for opportunistic infections and a use of combination therapies. Today HIV/AIDs positive individuals are seeking help to continue with life.

Socio-Demographic Characteristics of Adolescents in OTZ

The greatest variable for OTZ enrollment is the socio-demographic characteristics which is found to be a key factor in viral suppression who acquired HIV horizontally, hence these play a crucial role in care and treatment. There include (but certainty not exhaustive):

- Age-Lokpo et al (2020) associated patients age and viral load suppression with an evidence that older adolescents (15-19 years) exhibited a greater propensity for viral suppression than younger adolescents. Okonji et al (2021) also demonstrates that older age groups have self-efficacy and self-competency in ART adherence.
- Gender – Females are more likely to have a viral load under 1000 RNA copies/ml due to their ART adherence while males have lower levels of compliance to ART. This could be advanced to the notion of masculinity ingrained in the society with their attendant concomitant male socio-economic activities
- Family economic status- there are many hurdles for adolescents dealings with HIV/AIDS, but poverty directly or indirectly exacerbates there barriers. Financial instability, food insecurity, lack of access to health resources and other economic variables have a toll on viral load particularly in low-and middle-income societies which are consequent on poor adherence to ART (Schotanus-dijkstra et al., 2020). Ulunta et al. (2010) demonstrate that the issue of treatment interruption is not satisfactorily solved by offering free ART without adequately addressing additional financial obstacle such as transportation cost. This may affect the desire to reduce the viral load subsequently.
- Religion and its influence on viral suppression – religion often times play either beneficial or deterioratory roles in HIV programmes; however they are crucial in providing hope to the despairing whether they have total surrender to God to interfere in their treatment. WHO (2022) states that those with this notion come back with high viral loads as a result of poor adherence.
- Literacy and its collaboration in virologic suppression-lower educational attainment has been linked with lower self-reported medication adherence comparative with high educational attainment (Gueguen et al., 2021 and Lokpo et al., 2020).
- Socio-Cultural factors and their influence on virologic suppression. Many factors as already discussed have both social and cultural conotatons, hence their bearing on viral load which are often negative (Ulunta et al., 2010). Many cultures in Africa have debarring influence on the use of Orthodox approach but promote Africa's health treatment (Hofstede and Thousand, 2001).
- Health facilities factors related to viral suppression-Health facility related factors influence the overall management of ART. This includes failure to follow up, long waiting time for health workers, distances to health facilities, opening hours and sometimes general unfriendly approach of health workers. Gordon (2022) states that non-recording of essential data such as viral load test results, CD4 count and adherence rates may be unproductive and negative affect viral load.

METHODOLOGY

A cross-sectional survey design was utilized to carry out a quantitative research in APIN-supported implementing sites in Buruku LGA, Benue State. The population for this study include adolescents who are registered in the operation triple zero (OTZ) club meeting in APIN-supported implementing sites in Buruku LGA for the last six months and are currently on ART which is put at 320. Using Sullivan sample size formula a sample of 213 was had. A

multistage sampling technique was used to select the respondents for this study. A structured self-developed questionnaire was used for data collection. The questionnaire was distributed to be participants after approval was heard from the Head of Health department of Buruku LGA and acceptance of the participants. The participants were reassured of strict confidentiality of all information given and their identity will be concealed at all stages of the study.

The inclusion criteria: Those on ART, between 12 – 19 years old, current resident in Buruku LGA where they are taking their treatment, gave their consent to take part in the study and had viral-load results.

Those excluded for the study were those older than 19years who are HIV positive but not on ART, living outside Buruku LGA, those unwilling to participate in the study and those without viral-load results previously done.

Parents and guardians of the participants also gave their assents and approval for their wards to participate in the study.

Data Presentation

Data was presented using Tables as shown:

Table 1: Demographic Characteristics of Respondents

Respondent's Demographic	Variable	Frequencies	Percentage (%)
Gender	Male	60	30.6
	Female	136	69.4
Age Range	Below 14 years	106	54.1
	14-16 years	45	23
	17-19 years	45	23
Marital Status	Single	135	68.9
	Divorced	46	23.5
	Married	15	7.7
Occupation Respondents	Unemployed	120	53.6
	Employed	46	23.5
	Self-employed	30	15.3
Educational Qualification	Primary Education	60	30.6
	Secondary Education	106	54.1
	Non formal education	30	15.3
Religion Status Respondents	Christianity	165	84.2
	Islam	31	15.8
Total		196	100

There was a calculated sample size of 213, but only 196 responded to the questionnaire and presented themselves to active participation in the activities of OTZ. The remaining 17 sampled refrained from the club since the study was done during farming season, many opted for farming activities than attending to the club. Besides, financial constraints was adduced by some as a reason of non-participation.

Table 2: The viral Load of adolescent in Buruku LGA before OTZ enrolment

	Responses	Frequencies	Percentage (%)
Valid	Viral load was less than 50 copies/ml	15	7.7
	Viral load was between 50-999 copies/ml	45	23.0
	My viral load was 1000 copies/ml and above	121	61.7
	Missing System	15	7.7
	Total	**196**	**100.0**

Table 3: The viral load of adolescents in Buruku LGA after OTZ enrolment

	Responses	Frequencies	Percentage (%)
Valid	Viral load was less than 50 copies/ml	75	38.3
	Viral load was between 50-999 copies/ml	45	23.0
	My viral load was 1000 copies/ml and above	61	31.1
	Missing System	15	7.7
	Total	**196**	**100.0**

The viral-load measurement were obtained from the medical records of the participants as recorded in their clinical notes at the clinics they were attending (Table 2).

The viral-load measurements were reassessed 6 months after enrollment on the OTZ programme as reported and as presented in Table 3.

Table 4: Impacts of OTZ peer influence on viral load suppression

	Responses	Frequencies	Percentage (%)
Valid	OTZ peer association has made me to take my drugs more frequently	91	46.4
	OTZ peer association has made me shy away from taking my drugs	30	15.3
	OTZ peer association has made me feeling different about taking my drugs	30	15.3
	OTZ peer association has impacted positively my life	30	15.3
Missing	System	15	7.7
	Total	**196**	**100.0**

Table 5: Socio-demographic factors influencing viral load suppression among the adolescents

	Responses	Frequencies	Percentage (%)
Valid	Being male or female	15	7.7
	Distance of my house to the health centre	121	61.7
	My income level	15	7.7
	My age is a negative factor	30	15.3
Missing	System	15	7.7
	Total	**196**	**100.0**

Table 6: Healthcare worker related factors to viral suppression among adolescents of the OTZ club

	Responses	Frequencies	Percentage (%)
Valid	They are hostile to me anytime I visit facility	31	15.8
	They keep me for longer times when I come for drug pick up	15	7.7
	They advise me to be hardworking to be a great person in life	150	76.5
	Total	**196**	**100.0**

DISCUSSION OF FINDING

A noteworthy finding is attributable to the category of adolescents who had already achieved viral load suppression below 50 copies/ml on enrollment in the OTZ initiative. Viral load suppression at this level is considered the "golden standard" in HIV treatment as it indicates "suppressed". Nasuuna et al, (2018) also attest to this. This is a testament to the effectiveness of ART and adherence to the treatment regimes. Though 15 (7.7%) of the respondents had viral load of less than 50 copies/ml, indicating that HIV treatment and care was already available to some adolescents even before OTZ initiation in the study area, through association between OTZ participation and viral-load improvement was not particularly measured.

Early diagnosis and immediate initiation of ART contribute to better outcome and reduce the risk of transmission (WHO, 2015). However, a deeper exploration is needed to understand the factors that contribute to the successful viral load suppression before OTZ.

Another group of adolescents had viral loads between 50 and 999 copies/ml (low level of viraemia) before enrolling in OTZ initiative. The findings indicates that some level of HIV treatment was already in place, but they needed increased access to ART and regular monitoring. Adolescents in this category should receive continued support to aid them achieve suppression below 50 copies/ml. suppression of the viral-load could be associated to OTZ, though no measurement was instituted.

This study finding indicates a diverse spectrum of viral loads of adolescents before their participation in OTZ initiative. Some of these adolescents had viral loads over 1000 copies/ml, indicating that they were at a higher risk of experiencing disease progression transmission and weakened immune system making them more susceptible to opportunities infection, Ulunta et al., (2010) and Zanomi et al., (2019) are also of this view. It is therefore crucial to conduct a thorough investigation to determine barriers and possible challenges leading to such high viral loads before joining the OTZ initiative. Interventions required to improve their viral load suppression may include optimization of treatment adherence to supports, mental health and stress services (Darrel, 1999) and social support networks. As indicated on table 3, a significant cohort of adolescent achieved complete viral load suppression event to under-detectable levels after joining the OTZ initiative. This carries profound implications with attendant impact on viral load suppression and adherence (UNAIDS, 2017).

The study also found a significant perceived association between adolescent's perceptions of gender influence on viral load. The gender-related factors encompass a range of issues including sociocultural norms, access to healthcare, gender based violence and differential health care-seeking behaviors. This can be improved by gender sensitive healthcare services, educational programmes and engagement to empower adolescents to overcome gender related barriers to care.

The findings highlights the impacts of geographical factors on health care access and treatment adherence particularly in remote rural riverine areas which may be hindered by linear distance and the obstacle of crossing big streams and the river Katsina-Ala in Buruku LGA.

Other obstacles are limited access to transportation, the unavailability of healthcare facilities and the time and efforts required for healthcare visits. These may affect their ability to achieve and maintain viral load suppression. Strategies to compact this include the establishment of satellite clinics, mobile healthcare units, or transportation support programmes.

Economic factors play a crucial role in access to healthcare, including the affordability of medication, transportation and other associated costs. By this, lower income adolescents may encounter these difficulties which are related and essential for viral load suppression. Interventions to mitigate these disparities may include but not limited to financial assistance programmes, social support network and advocacy for policies that reduce the economic burden of HIV care (Akpe, 2009).

Discussion of this study also reflected on age related perceptions, with some believing that adolescents negatively influence HIV infection. For adolescents living with HIV brings unique challenges regarding stigma, disclosure concerns and psychology-social issues. This is in agreement with the findings of Gordon (2022), stigma can be particularly pronounced in adolescence within peers, schools and social activities. Fear of disclosure and discrimination can lead to stress and psychological challenges, which may impact treatment adherence and viral load suppression. This then call for a holistic approach that considers age appropriate counselling, mental health support, peer interventions and psycho-social wellbeing.

With regards to health care provider's related factors, some responders expressed hostility from caregivers at healthcare's facilitates which have far reaching and negative impacts on various aspects of healthcare engagements, treatment adherence and overall wellbeing leading to poor communication and resulting in suboptimal care. It is imperative to investigate the root causes of hostility through surveys, focus group discussing or interviews to gain insights into the factors contributing to negative attitudes. Extended waiting time also negatively impacts

attending rescheduled appointments for assessment and medication regularly. This can lead to missed appointments and interruption in treatment which have severe consequences on treatment adherence, viral load suppression and disease management (Boar and Mashamba, 2005). Schotanus-dijkstra et al. (2020) and Ulunta et al. (2022) are of the notion that to mitigate this, health care facilities should priorities process optimization, stream lining medication pick-up process, implementing appointments scheduling septems, selling clear expectations for waiting times, improving the efficiency of administrative procedures and involving adolescents in decisions making, thus making the healthcare experience more patient-centered. Other reports depicted positive caregivers which fostered a sense of self-worth and resilience among adolescents.

The implications of this study are multifaceted and carry significance importance for the management and care of adolescence living with HIV/AIDS in the context of the Operation Triple Zero (OTZ) initiative in Buruku LGA, Benue State, Nigeria these implications can inform policies, practices and future research in the field of HIV/AIDS care and management particularly among adolescents.

CONCLUSION

The findings of this study critically highlights multiple factors influencing viral load suppression among adolescents living with HIV/AIDS. Many factors have an interrelationships with determining viral load outcomes - gender related factors, geographic behaviours, social economic status and age related challenges are referred to as some of the factors. Identifying and addressing these factors is essential for designing mitigating interventions that empower adolescents to achieve and maintain viral load suppression and ultimately empowering their overall health and wellbeing.

The research findings shed light on the diverse spectrum of viral load outcomes among adolescents living with HIV/AIDS before and after their participation in the OTZ initiative. This initiative aims to provide comprehensive care, psychological care and support to these group, particularly focusing on improving their viral load suppression, which is critical aspect of HIV management, many participants demonstrated progress in reducing their viral loads compared to before OTZ enrollment, thus showing promising progress and effects of OTZ initiative.

Recommendations

The following recommendations are made in relation to the study:

- Recognize and celebrate adolescents who achieve undetectable viral load as HIV defeatist. This is to empower them to become peer mentors and advocates.
- Recognize and emphasize the crucial roles caregivers play in adolescents HIV care. Provider training and guidance for caregivers on how to offer emotional and psycho-social support. Re-enforce positive care giver interactions and open communication.
- Ensuring continuous care and support for adolescent with suppressed viral loads.
- Identifying and mitigating specific barriers hindering the attainment of undetectable viral load levels-offer additional counselling, adherence support and mental health services.

- Recognize the impact of geographic barriers interference on health care access to reduce travel distance and circumvent geographical obstacles.
- Develop financial assistance programs targeting lower income adolescents in term of grants and vocational training.

Incorporating there recommendations into the general elaborate care and support framework for adolescents living with HIV/AIDS can contribute significantly to improve viral load suppression outcomes, overall wellbeing and a brighter future for this vulnerable population segment.

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