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Impacts of Operation Triple Zero (OTZ) Club Support Group on Anti-Retroviral Therapy (ART) Adherence among Adolescents in Enugu State

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Abstract

More than two-thirds of people infected with HIV live in Sub-Saharan Africa. Adherence to Anti-Retroviral Treatment (ART) is a key factor that leads to viral load suppression, while non-adherence is a major cause of HIV drug resistance and subsequent immunological and clinical failure. Participating in a support group for adolescents has been shown to be a significant resource for improve adherence among adolescents with chronic illness. The aim of this study was to investigate the impact of Operation Triple Zero (OTZ) clubs on ART adherence among adolescents on ART. A cross-sectional study was conducted on HIV/AIDS adolescent patients accessing treatment at Enugu State University Teaching Hospital, Mother of Christ Hospital and Poly clinic all in Enugu North LGA, Enugu State, Nigeria. All the Adolescents (ages 10 -17) on ART on-treatment were the source population. A simple random sampling using the lottery method was used to select the files of the participants using the patient files. The participants were grouped into two, those that were enrolled in OTZ club and those not enrolled in any of the support group. Data generated were analyzed with Chi square using SPSS version 20.0 at a 95% confidence interval. Results show that females (50.4%) participated more in the study compared to males (49.6%). It also shows that the mean age of the respondents was 13.2±2.14 with majority (43.4%) of the respondents between the ages of 10-12years. The results also show that those enrolled in OTZ club have higher viral load suppression rate (92%) as compared to those not enrolled in the

programme (48.3%). The result of data analysis shows that demographic factors such age and sex does not have significant effect on ART adherence which could be indicated in viral load suppression (p> 0.05%) but participation in support group activities have. The education and support received from support group could help adolescents understand the importance of taking care of their health by adhering to their ART.
Keywords: Adherence, Operation Triple Zero, Social Support, Support Group, Vulnerable Children.

Introduction

HIV/AIDS is a chronic and devastating disease of global public health concern (UNAIDS, 2013). The disease has been declared a global public health emergency by the World Health Organization. Since its discovery, HIV still remains one of the most challenging pandemics facing the world. The pandemic has caused millions of deaths worldwide and has crippled the lives of many more. In 2012 alone, there were 35.3 million people living with HIV and 1.7 million died from AIDS related causes worldwide (UNAIDS, 2020).

Sub-Saharan Africa still tops the lead among the region of the world affected by HIV, accounting for two-thirds of the global burden of disease. It is estimated that people infected by the virus in Sub-Saharan Africa stands at about 25 million adults and children, accounting for nearly 70% of the global total. As of 2019, 1.8 million people in Nigeria were living with HIV. Women were the most affected group, counting about one million individuals. Children up to 14 years who were HIV positive equaled to 150 thousand (UNAIDS, 2020). Nigeria ranks among countries with the highest burden of HIV in the world, next only to South Africa. Previously, many people requiring Anti-Retroviral Therapy (ART) were not enrolled due to non-accessibility and the cost of obtaining the drugs. This adversely affected adherence to ART and viral load suppression leading to high HIV/AIDS morbidity and mortality.

In recent times, due to remarkable efforts made by many philanthropists and non-governmental organizations including the United States President's Emergency Plan for AIDS Relief (PEPFAR), the Global Fund for HIV, TB and Malaria and the Clinton foundation in making drugs accessible to everyone through sponsorship and the introduction of more effective ART, significant gains have been made in mitigating the impact of the HIV/AIDS pandemic (Hudelson and Cluver, 2015). The increasing efficiency of and access to ART, along with increasing improvements in ART service delivery have redefined the HIV epidemic from a deadly infectious disease to a chronic, manageable disease (Mukumbang *et al*., 2017). Despite the remarkable stride made towards controlling HIV/AIDS, poor adherence to treatment and suboptimal retention in care are expected to continue to present significant challenges to ending AIDS by 2030 (Wong *et al*., 2017).

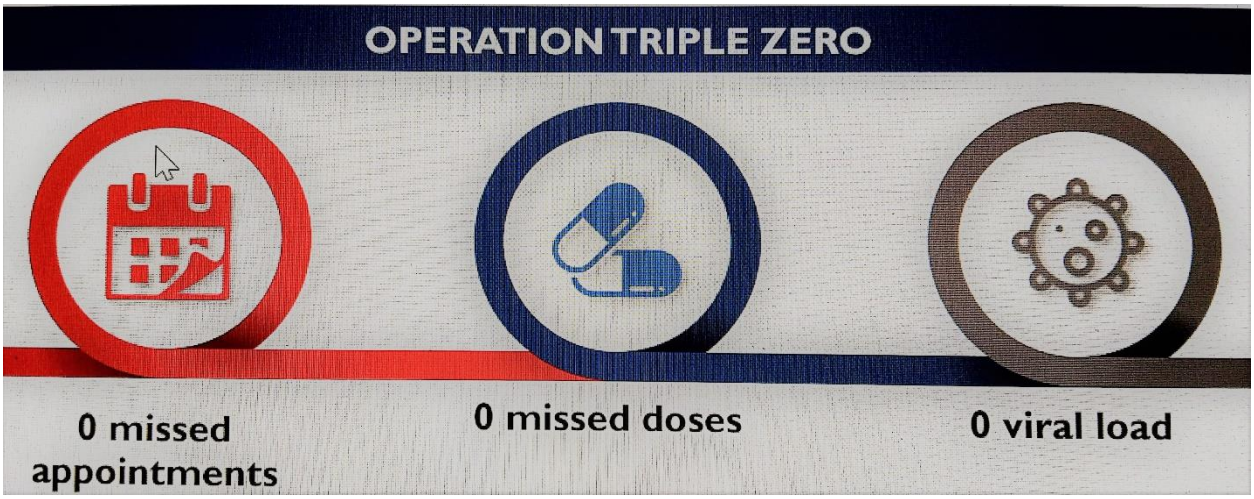


Image credit: USAID.GOV (improving treatment outcomes).

Young people living with HIV (YPLHIV) constitute a major significant sub-population of people with HIV globally. The increasing availability and efficiency of ART worldwide has resulted in more children and adolescents living longer with HIV (Sam-Agudu *et al*., 2017). Despite the progress recorded in the area of ART efficacy and availability, it has been recorded that adolescents struggle to initiate, remain engaged, and consistently adhere to ART (Aderemi *et al*., 2014). While most of the individual, social and health system barriers associated with ART adherence and retention in care affecting the general population also apply to YPLWH, they face greater risks of mental and behavioral health problems, which constitute additional barriers (Woollett *et al*., 2017).

To promote ART adherence and retention in care among YPLWH, many psychosocial supports have been initiated, one of which is the operation triple zero (OTZ) Club (Schotanus-dijkstra *et al*., 2017). OTZ Clubs offer a comprehensive HIV treatment literacy package and empower YPLHIV to be self-health managers. Furthermore, they commit to a simple treatment goal of achieving "three zeroes": zero missed appointments, zero missed drugs/medications, and zero viral load (VL). The programmes empower participants to take charge of their health, take control of their decisions, receive support from fellow peers, and identify with peers who are doing well (Schotanus-dijkstra *et al*., 2017). OTZ Clubs are facilitated by facility treatment personnel and nurses in the hospitals (Schotanus-dijkstra *et al*., 2017). They have the common goal of giving YPLHIV the psychosocial support needed for better ART adherence and viral load suppression.

It has been well documented that psychosocial support affects the adherence and retention in ART care among adults living with HIV (Spaan *et al*., 2018). Nevertheless, there is little evidence on the nature and role of psychosocial support such as OTZ club for YPLHIV. There is thus need to investigate the impact of support groups on YPLHIV, as well as document the impact. Although there has been some proposed positive effect of support groups on YPLHIV but they are mere theoretical assumptions. The need to empirically validate this claim informs the intention of this study.

This study is anchored on the Social Support Theory. The Social Support Theory, emerged from publications by Don Drennon-Gala and Francis Cullen, both of whom drew on insights from several theoretical traditions. The theory is centered on the proposition that instrumental, informational, and emotional supports reduce the likelihood of delinquency and crime.

Social support is commonly conceptualized as the social resources on which an individual can rely when dealing with life problems and stressors (Thoits, 1995). Cullen, Wright, and Chamlin (1999) described social support as a process of transmitting human, cultural, material, and social capital, whether between individuals or between larger social units (communities, states) and their members. Support is often provided informally, through social relationships,

Cullen et al., (1999) argued that social support is a key theoretical concept influencing the likelihood of individual criminal behavior. In general, the more social support there is in an individual's social network, the less likely it is that person will engage in crime. Among adolescents, the more support provided by the family, particularly positive, sustained relationships with parents, the lower is the risk for delinquency. Social support can create a context in which strong prosocial bonds form and also create a context in which parental and other social controls are most efficacious.

Methods

Study design and setting

A cross-sectional study was conducted involving HIV/AIDS adolescent patients accessing treatment at Enugu State University Teaching Hospital (ESUTH), Mother of Christ Specialist Hospital (MOC) and Poly Sub District Hospital (Poly) all in Enugu North LGA, Enugu State, Nigeria. These are among the largest hospitals in Enugu state and the largest hospital in Enugu North LGA. There were 4436 HIV/AIDS patients on treatment in MOC, 3677 in ESUTH and 1916 in Poly hospital at the time of the study. And there were 205 adolescents on ART in the three facilities (as at January, 2021). All the Adolescents (10 -17) on ART on-treatment at MOC, ESUTH and Poly were the source population.

Sample Size Determination and Sampling Techniques

The sample size was calculated using the formula for estimation of a single population proportion ($n = [(Z\alpha/2)^2 \times P\ (1\text{-}P)]/d^2$) with the assumptions of 95% Confidence Level (CL) and marginal error (d) of 0.05. A viral suppression level of 0.88 (88.0%) was taken from the study conducted in Nairobi (Cherotich, 2019). Based on this formula, the calculated sample size yielded 129 study participants.

A simple random sampling using the lottery method was used to select the files of the participants. The sampling was done using patient files. First, all 205 patient cards were collected from the ART clinic and coded.

Then, 129 patient cards were randomly selected using probability methods. Finally, data were collected from randomly selected patients using the facility electronic records.

Measurement and Data Collection Procedure

Data was collected using patient cards and facility electronic records. The dependent variable was adherence to ART which was measured using viral load suppression and the independent variables were socio-demographic characteristics which include age, gender and enrollment in support group meeting. The adherence level was measured by checking the viral load results. Any viral load count less than 1000 is considered suppressed while a viral load count above 1000 is considered unsuppressed. This was based on PEPFAR guidelines.

Data were collected by three trained personnel that were expert in the use of Microsoft excel and one supervisor.

Data quality control

The participants were grouped into two, those that were enrolled in OTZ club and those not enrolled in any of the support group using information available in the facility electronic records. Information was only collected from the folders of those that have been enrolled on OTZ club for at least six months before the viral load test, for the first group and those that never attended any of the group meeting, for the second group. This was to properly access the impact of the support group against those that were not enrolled in the group.

Data processing and analysis

The required data from electronic record were filtered, coded, checked, cleaned and entered into excel and exported to Statistical Package for Social Sciences (SPSS) version 20.0 for analysis. Data generated were represented in tables, frequencies and percentages. All associations and statistical significance were measured with Chi square using an odds ratio at a 95% confidence interval with a p-value of less than 0.05.

Ethical consideration

This study was reviewed and approved by Twinning for Health Support Initiative – Nigeria, Sub-grantee of the 4GATES OVC project in Enugu State, working in these facilities with those enrolled in ART. Written informed consent was obtained from caregivers of the study participants and they were also assured that they could choose to drop out of the study if need be. The patients' information was kept confidential.

Results

Socio-demographic characteristics of respondents

A total of 129 respondents were accessed using their facility folders and the result is presented in Table 1. As can be seen, Females (50.4%) participated more in the study compared to males (49.6%). The gender was fairly evenly spread. The mean age of the respondents was 13.2±2.14 with majority (43.4%) of the respondents between the ages of 10-12 years with age range 16 – 17 (20.2) making up a smaller age group among the respondents.

Table 4.1: Socio-demographic characteristics of respondents

Variable	Frequency	Percentage (%)
Gender		
Male	64	49.6
Female	65	50.4
Age in Years		
10 – 12	56	43.4
13 – 15	47	36.4
16 – 17	26	20.2

13.2±2.14

The rate of viral load suppression among those enrolled in support group and those not enrolled in the group

Table 2 shows the rate of viral load suppression among those enrolled in OTZ clubs and those not enrolled in the group. The results show that those enrolled in OTZ clubs have higher viral load suppression rate (92%) as compared to those not enrolled in the programme (48.3). Equally, those not enrolled in any support group have higher viral load unsuppressed rate (51.7) when comparing with those enrolled in support group programme (8). This suggests that the support groups contribute to their understanding the need to adhere to their medication as reflected in increased virus suppression.

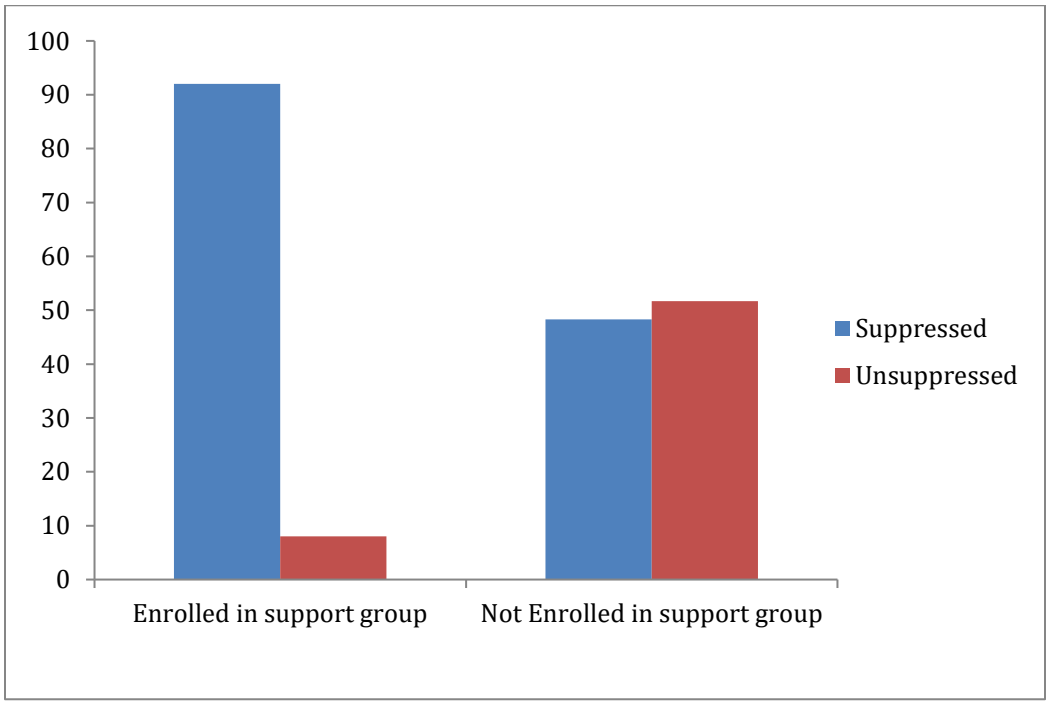
Table 2: The rate of viral load suppression among those enrolled in support group and those not enrolled in the group.

Variable	Frequency	Percentage (%)
Enrolled in Support Group		
Suppressed	92	92
Unsuppressed	8	8
Total	**100**	**100**
Not Enrolled in Support Group		
Suppressed	14	48.3
Unsuppressed	15	51.7
Total	29	100

13.2±1.16 (Mean±STD)

Figure 1 shows comparison in viral load suppression between those enrolled in support group and those not enrolled in the group. The results show that those enrolled in OTZ clubs have very high viral load suppression and those not enrolled in any of the support group have very low viral load suppression. It suggests that those enrolled in the support group adhere more to their ART which is indicated in their very high viral load suppression.

Figure 1: Comparison of the viral load suppression among those enrolled in support group and those not enrolled in the group.



Difference between gender and viral load suppression

Table 3: Difference between gender and viral load suppression

The gender of the respondents	Viral Load Suppression		
	Suppressed	Unsuppressed	Total
Male	52	12	64
Female	54	11	65
X^2 (N=129) P= 0.261			

The table above shows difference between gender and viral load suppression. Chi square was used to test if gender has effect on viral load suppression at $p > 0.05$. The result shows that gender does not have effect on viral load suppression with $p = 0.261$. In other words, both male and female have about equal chances of having viral load suppression.

Difference between age and viral load suppression

Table 4: Difference between age and viral load suppression

Age distribution	Viral Load Suppression		
	Suppressed	Suppression	Total
10 – 12	45	11	56
13 – 15	40	7	47
16 – 17	21	5	26
X^2 (N=129) P= .306			

Analysis carried out to determine if age of adolescent has an effect on viral load suppression is shown in table 4. Chi square was used to test if the age of adolescent has effect on viral load suppression at $p > 0.05$. The result shows that age of adolescent does not have effect on viral load suppression with $p = 0.342$. In other words, adolescent of age 10 to 17 years has about equal chances of having viral load suppression.

Difference between support group and viral load suppression

Table 5: Difference between support group and viral load suppression

Support group	Viral Load Suppression		
	Suppressed	Unsuppressed	Total
Enrolled Support group	92	8	100
Not enrolled in support group	14	15	29
X^2 (N=129) P= 0.026			

Again, analysis carried out to determine if support groups have effect on viral load suppression using Chi square at $p > 0.05$ is shown in table 5. The result shows that support groups have effect on viral load suppression with $p = 0.026$. This shows that support groups significantly contribute to chances of having viral load suppression.

Discussion

This study investigated the impact of OTZ club on ART adherence among adolescents on ART at ESUTH, MOC and Poly clinic all in Enugu State, Nigeria. The findings show that there were more females (50.4%) adolescents on ART in the facilities studied than males (49.6%) counterpart, although there were no significant differences. This is in related to the findings obtained by Bello (2011) and Oku (2014) who also reported higher number of female on ART in their research. This may be because females have high tendency of presenting to the hospital when infected.

It was found out that those enrolled in OTZ clubs have a higher viral load suppression rate (92%) as compared to those not enrolled in the programme (48.3). The study by Mills *et al* (2006) have shown that social support could be a strong facilitator of adherence to ART which can lead to viral load suppression. Equally, a review by Ammassari *et al*. (2002) which summarized the results of 20 studies investigating the issue of barriers to optimal highly active antiretroviral therapy (HAART) adherence, revealed that lack of social support, amongst other factors were most consistently associated with non- adherence which results to unsuppressed viral load.

In this study, findings of factors that affects adherence to ART showed that demographic factors such age and sex are not associated with adherence ($p > 0.05\%$), this is similar to study by Agu, (2011) which found that age and sex were not found to have any association with adherence ($p > 0.05\%$). Similarly, a study by (Oku, 2014) reported similar finding that age, sex, occupation and educational status are not associated with adherence ($p > 0.05\%$).

OTZ club meeting attendance was found to be associated with adherence in this study which is in agreement with the report of Mills *et al* (2006) which stated that social support is a strong facilitator of adherence to ART which can lead to viral load suppression. It also agrees with the findings of Diabate´ (2007) which shows that lack of social support were associated with poor adherence. This could be attributed to the increased knowledge on the importance of adherence gained during the support group meeting.

Conclusion

The study has shown that, through OTZ club, children are retained in care, with an excellent adherence to ART and have viral load suppression. It equally shows that age and sex does not have effect on adolescent's adherence to ART and viral load suppression. Therefore, enrollment to OTZ club is recommended to all adolescents on ART programs.

The findings of this study could also prove useful to policy makers, program planners and antiretroviral service providers in the state and country for implementing large scale adherence interventions. A follow-up study is also recommended to see if this effects continue over time.

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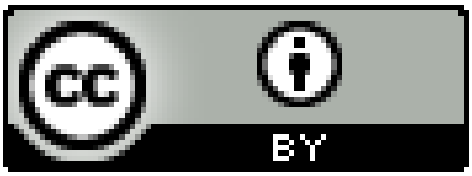

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