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Effectiveness of Outreach Clinical Mentoring on Retention in Care and Viral Suppression among HIV Positive Young Persons on Art in North Central Nigeria

Ogwuche John Igoche[1] ; Ruth Amarachi Ogbonna[2] ; Ejila Moses Onehi[3] ;
Adamu Ibrahim Alhasan[4] ; Attah Peter[5] ; Inyang Nsikak Isaac[6]
[1] Nasarawa State AIDS Control Program Ministry of Health Lafia Nasarawa State,
[2] Ministry of Health Lafia Nasarawa State,
[3] Nasarawa State AIDS Control Program Ministry of Health Lafia Nasarawa State,
[4] Department of Public Health, Ministry of Health Lafia Nasarawa State,
[5] Department of Public Health, Ministry of Health Lafia Nasarawa State,
[6] Principal Medical Officer Lafia Nasarawa state

Corresponding Author: Ogwuche John Igoche,
Nasarawa State AIDS Control Program, Ministry of Health, Lafia Nasarawa State.

Abstract:-

➢ ***Introduction***

Sexual and reproductive health challenges vis-à-vis Human immunodeficiency virus/Acquired immune deficiency syndrome, constitute a complex phenomenon in young persons. These health complexes have been shown to adversely affect the disclosure of their positive status, their adherence to medications or retention in care and overall quality of life. This study was meant to determine the effectiveness of deliberate clinical mentoring on retention in care, measured by the rate of interruption in treatment and viral suppression among young persons on anti-retroviral therapy.

➢ ***Methods***

This study employed a facility-based quasi-experimental design. A multi-stage sampling technique was used to select study participants. The three senatorial zones of Nasarawa state were selected through a purposive sampling method at stage one. One Local Government Area was selected from each of the three senatorial zones through simple random sampling technique at stage two. Five health care facilities were randomly selected from each of the three selected Local Government Areas through balloting at stage three. Baseline data was collected at the beginning of the study; mid-term data mid-way into the study and post-intervention data was collected at the end of the study. The respondents/mentees were mentored for a period of eight months.

➢ ***Results***

Difference in means of interruption in treatment rates at baseline and at midterm, which is an estimate of the amount by which intervention changed the outcome was –0.69605 with a p-value of 0.359. Mean differences in interruption in treatment rates pre- and post-intervention was 0.7333 with a p-value of 0.033, which was statistically significant. In a similar vein, mean differences in viral suppression rates at start of study and mid-term on the one hand, and then pre- and post-intervention on the other hand, were respectively 4.80000 and 3.40000. The corresponding p-values were 0.235 and 0.174, which were not statistically significant.

➢ ***Conclusion***

This study showed 100% retention among young persons on anti-retroviral therapy following 8 months of meticulous outreach clinical mentoring. The study also showed improvements in viral suppression rates, but the extent statistically, was not significant. Clinical mentoring should therefore, be prioritized and strengthened for better clinical care outcomes in positive young persons on anti retroviral therapy.

Keywords:- *Clinical Mentoring, Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome, Interruption in Treatment, Viral Load, Young Persons.*

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I. INTRODUCTION

The discovery of highly active anti-retroviral therapy (HAART) to combat the human immunodeficiency virus (HIV) pandemic in the mid-nineties is regarded as a significant public health milestone (1,2).

Nigeria is home to 9% of those living with HIV/AIDS globally, contributing to more than 10% of new infections and more than 10% of AIDS-associated mortality globally (3,4). 37% of new infections worldwide occur in young people.[1] Young people are made up of individuals aged 10-24 years and comprise adolescents and youths (5). Of the 1.8 billion young people around the world today, about 17.5% reside in Africa and make up 31.8% of the total population in Africa (6,7) In Nigeria, 31.4% of the population are young people of which adolescents constitute about 72.6% (7). Young people encounter many challenges, of which sexual and reproductive health rank second in respect of priority (5) Due to early puberty, early sexual debut, rising incidence of illicit sexual behaviors among others, young people are more predisposed to HIV/AIDS and other sexually transmitted infections, unsafe abortions, sexual exploitation and violence (8,9).

Apart from the physical, mental, social and psychological changes that young people undergo, young people living with HIV have reported mental challenges such as psychological distress, suicidal tendencies, anxiety disorders and depressive illness (10,11). Psychosocial challenges also involve development of a unique social image and individuality that emanate directly from self-perception of HIV status (12). These health complexes have been shown to adversely affect disclosure, adherence to medications or retention in care and their overall quality of life (10,11). In addition, the medications that adolescents living with HIV have to take for a lifetime present challenges that may also adversely affect quality of life (13,14,15). Transition of care makes it incumbent on an adolescent to take responsibility for his/her care in respect of quality decision making. This adjustment may be difficult without good psychosocial support (16,17)

According to United Nations Program for HIV/AIDS (UNAIDS) 2022 epidemiological estimates, 92% of people living with HIV (PLHIV) on HAART were virally suppressed, but only 68% of all PLHIV were virally suppressed.[18] The prevalence of HIV in Nasarawa State is 2% and among people aged 15-49 years old is 5.9%, compared to the national estimate of 2.8% (18). About 10,300 adolescents are living with HIV in Nasarawa State, making up 4.5% of the total in Nigeria (18,19). According to the Nasarawa State Surge project which commenced in May 2019 in response to Nigeria's HIV/AIDS Impact and Indicator Survey (NAIIS), the number of PLHIV as at December 2021, was 33,090 and viral suppression rate was 95% (20,21). Estimates of viral suppression rates after 12 months of HAART in low and middles-income countries (LMIC), depending on the HIV RNA threshold, range from 50% to as high as 90% (22,23).

In a study in Nigeria, only 50% of patients on standard care achieved undetectable viral load of less than 400 copies per ml after one year of ART (24). In another study in Jos among PLHIV, there was a high level of treatment modification of 83%, treatment discontinuation of 28% and early virologic failure of 49% among patients receiving standard care (24,25,26)

The 2030 target of the modified Joint UNAIDS 95 – 95 – 95 target, did not consider young people as a priority group in spite of the fact that mortality increased by 50% in that age group compared to other groups where mortality decreased by 35% between 2005 and 2013 (1,27). In Nigeria, the National HIV/AIDS Strategic Plan aligned with UNAIDS target, but failed to mention young people as a special category (4). The National HIV Strategy for Adolescents and Young People made reference to only 50% of young people in respect of linkage to care, but was silent on retention, viral load monitoring and viral suppression (10,28).

Clinical mentoring, as defined by WHO, is the systematic process of practical training and consultations that foster on-going professional development to yield sustainable high-quality clinical care outcomes. Among other roles, clinical mentoring identify areas for improvement, embraces responsive coaching and modelling of best practices, advocacy, data collection and routine reporting. This study is meant to determine, real time, the effect of outreach clinical mentoring on retention in care on the one hand, and viral suppression rate among young persons on standard ART on the other hand, in order to make evidence-oriented recommendations on programmatic and policy issues in the drive towards the attainment of epidemic control of HIV/AIDS. This concept is captured in this study's research paradigm (Appendix 1).

II. MATERIALS AND METHODS

Nasarawa State, one of the 36 states in Nigeria, is located in the north-central geopolitical zone of the country. It is a multi-cultural setting that is bordered in the north geographically, by Nigeria's Federal Capital Territory. It has an estimated population of 1,869,377 based on the 2006 population census. The main occupation of the indigenous people is farming. It is made up of 13 Local Government Areas (LGAs) spread around three political senatorial zones.

It was a facility-based quasi-experimental study. The facilities recruited for the study were those that were offering verifiable ART services at least one year prior to the commencement of this study. Multi-stage sampling technique was used for this study. At stage one, the three senatorial zones of Nasarawa state were selected through a purposive

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sampling method to enhance fair representation. In stage two, one LGA was selected from each of the three senatorial zones through simple random sampling technique. In stage three, five health care facilities were randomly selected from each of the three selected LGAs through balloting.

The data tools used for this study were facility encounter records, pharmacy drug pick-up records and viral load assessment records. The clinical mentors (CMs) who were all medical doctors recruited for the on-going US CDC-backed National HIV/AIDS Clinical Mentorship Program, had a week-long, intensive residential training on the tenets of clinical mentoring prior to the commencement of this study. The Director of Public Health (DPH), Nasarawa State's Ministry of Health, through an introductory letter presented to the various facility heads, introduced the CMs and also gave a synopsis of the novel Clinical Mentorship Program, vis-à-vis, its place in the global drive towards achieving epidemic control for HIV/AIDS.

III. INTERVENTION

The intervention which lasted for eight months was divided into three phases:

- *Phase One*

In the first week, clinical mentors held facility entry/advocacy meetings with facility heads in all the recruited sites. The timing of the meetings at the various facilities were flexible in order to avoid or minimize interruptions in daily service delivery routines. The meetings were interactive in all cases and lasted between one and two hours. Baseline secondary data were extracted from the viral load assessment records and the drug pick-up records across all the facilities recruited for the study by the trained CMs.

From the second week, depending on the context, routine one-on-one or group mentoring activities commenced in earnest on week days. Mentees were all the facility staff directly involved in HIV/AIDS prevention, care and management. Some of the components of the daily week-day routines of CMs were relationship building through cordial interactions and continuous promotion of public relations etiquette; technical sessions involving teaching, hands-on coaching, provision of working aids like the current National Treatment Guideline and information, education and communication materials (IEC); demonstrations and role play where applicable; data collection, assessment of data tools for completeness and corrections where applicable; direct participation in service delivery like clinical consultation, counselling, client tracking; advocacy to the MOH and to the Implementing Partners (IPs) where necessary; compilation of routine weekly/monthly data summary; feedback to facilities after weekly/monthly data analysis etc. All the above activities continued throughout the follow-up period in all the facilities recruited for the study.

- *Phase Two*

At the end of the fourth month, which was mid-way through the follow-up period, mid-term data was also collected on viral suppression rates and retention rates. As a form formative evaluation, the data was collated and analyzed and some of the findings were used to fine-tune the mentoring process.

- *Phase Three*

At the end of the eighth month, post-intervention data on viral suppression rates and retention rates were also collected.

Quantitative data was checked for completeness and analyzed with IBM Statistical Package and Service Solution version 23 (SPSS version 23) software. The data was presented as tables. Continuous variables were summarized using means and standard deviations. Differences in viral suppression rates and retention-in-care rates before intervention, mid-way into intervention and after intervention were tested using paired t-test (statistical test of significance). $P \leq 0.05$ was considered statistically significant.

Ethical approval for this work was obtained from the Research Ethics Committee of Nasarawa State Ministry of Health (NHREC Protocol No:18/06/2017).

The main limitation of this study was the fact that the study used a quasi-experimental design without a comparison group which may reduce the statistical power of the findings. Effort was however, made through meticulous randomization to minimize non-random errors.

IV. RESULTS

From table 1 (Appendix 2), the standard deviations for pair 2, midway and post-intervention were approximately zero, indicating the fact that the data points were clustered around the mean. Similarly, the standard error of means are also close to zero, suggesting the fact that the sample mean could be a true predictor of the population mean.

For all other observations, standard deviations had high values and data points were therefore higher than or spread away from the mean. The high values of standard error of means were indicative of the fact that they may not be true representations of the population mean.

From table 2 (Appendix 3) above, the difference in means of IIT at baseline and at midterm, which is an estimate of the amount by which intervention changed the outcome was – 0.69605 with a p-value of 0.359. There was therefore no statistically significant difference in IIT rates at baseline compared to mid-way into the study. This evidence was also supported by a wide confidence interval which crossed the zero mark.

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Mean difference in IIT rates pre- and post-intervention was 0.7333 with a p-value of 0.033, which was statistically significant. There was also a narrow confidence interval which did not cross the zero mark.

In a similar vein, mean differences in viral suppression rates at start of study and mid-term on the one hand, and then pre- and post-intervention on the other hand, were respectively 4.80000 and 3.40000. The corresponding p-values were 0.235 and 0.174, which were not statistically significant. The confidence intervals were also wide and had both negative and positive values.

V. DISCUSSION

In this study meant to assess the effectiveness of out-reach clinical mentoring on retention and viral suppression among young people living with HIV/AIDS in Nasarawa State, there was no statistically significant difference in the mean IIT rates at baseline compared to the mean IIT rates midway into the study (p-value = 0.359). The fact that there was no statistically significant difference in IIT rates at the beginning of the study compared to midway into the study may be explained by the relatively short duration of follow-up at that stage of the study. Among other things, the interventions were in the form relationship building, on the job coaching and modeling of best practices. All these measures were systematically directed at attitudinal changes, changes in knowledge and changes in practice. Knowledge and practice may be easily influenced in a relatively short period of time, but attitudinal changes usually take longer periods to become expressly obvious (29).

On the contrary, there was a statistically significant difference (p = 0.036) in the mean IIT at baseline (-0.21333) compared to the mean IIT post-intervention (0.07333), which was suggestive of about 100% retention among young persons. The study in Jos afore-mentioned earlier reported a treatment discontinuation of 28% (26). Another study in Uganda and Kenya, reported a retention rate after 48 weeks of follow-up of 92% (30). This study used a streamlined treatment approach and the researchers were of the opinion that the approach adequately addressed structural barriers, issues in patient-clinician relationship and knowledge gaps that may have led to stigma and poor motivation prior to study.

The high retention rate in the index study may be a direct function of the intervention which was systematically deployed through practical trainings and consultations that fostered on-going professional development with the potential to yield sustainable high-quality clinical care outcomes. Among other roles, the mentoring process also identified areas for improvement, embraced responsive coaching and modeling of best practices, advocacy, data collection and routine reporting/feedback. Through thorough emphasis on community service components like social mobilization, meticulous tracking, partner notification services, long appointments and home drop-off of drugs, structural barriers like distance to health facilities, long waiting time and frequent visits were addressed.

There was no statistically significant difference (p = 0.235) in viral suppression rates at start of study compared to midway into the study. In a similar vein, there was no statistically significant difference (p = 0.174) in means observed before intervention compared to the means observed after intervention. There was demonstrable increase in viral suppression rates after intervention, but the extent statistically, was not significant. It is worthy of note that the analysis in this study captured only young people aged between 10 years of age and 24 years of age. As such, the findings may not be a good predictor of the rates of retention and viral suppression among all PLHIV in Nasarawa State. Other contextual factors may explain some of the findings above. Firstly, the follow-up period in some of our catchment communities were fraught with incessant security challenges that generated internal displacements which impacted negatively on the smooth running of the ART program in some centres. Facility staff, mentors and implementing partners even had occasions to navigate dangerous terrains in order to take services to displaced clients. Secondly, some of the health facilities are run by volunteer staff whose only income emanate from irregular stipends given at facility level. Most of them complained that they no longer receive honorarium from the implementing partners. The result was low morale and poor enthusiasm on the part some of the workers in this category. Mentors addressed this through continuous advocacy and subtle intangible incentives like relentless coaching, quality health information dissemination, relationship building and modeling of best practices. The third drawback noted hands-on was the paucity of funds for facility-initiated tracking, continuous virtual engagement and adequate community outreaches. The desire in some cases could be felt, but the means were lacking. Lastly, task shifting in accordance with the Ouagadgou Declaration was over-burdened in some of the facilities. For example, there is a fairly busy facility where the clinician functions as the counselor, pharmacy focal person, tracker, tester and the record clerk. This, sure will be counter-productive programmatically.

Different studies in low and middle-income countries have estimated viral suppression rates of between 50% and 90% after 12 months of standard regimens (22,23). In another study in Nigeria, only 50% viral suppression was reported in patients on standard care after one year of ART (24). The study in Jos reported early virologic failure of 49% among patients receiving standard care (24). These are institution-based studies and the findings are likely to come across with low statistical power. The findings are however, out of tune with findings from a similar study in Zambia which reported a statistically significant improvement in viral suppression rate

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(88.8% to 90.1%) (31) after the follow-up period. In spite of the limitations admitted by the researchers, the sample size for this study was adequate, the statistical power is expected to be high and deductions from this study may have good external validity.

By way of recommendation based on the findings above, vis-à-vis, the sensitive position that young PLHIV occupy in the coordinated drive towards epidemic control of HIV/AIDS, there is the need for funders to organize regular, structured capacity building sessions for relevant stakeholders in the cascade of care in order to further deepen the ART program; there is also the need to provide financial incentives to boost the morale of volunteer staff who incidentally, constitute majority of the implementation workforce; funding for community outreaches should be up-scaled in order to embrace hard-to-reach areas on a continuous basis; better accountability mechanisms should be established to track funds released to facilities for outreaches; the existing performance management modalities should be modified for better assessment of the performance of field staff and finally, implementation research, preferably championed by clinical mentors may be required to examine real-world context of other factors that may be responsible for some of the set-backs in the ART program.

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- *Conflict of Interest*

The authors hereby declare that there's no conflict of interest in the course of this research work.

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APPENDIX 1

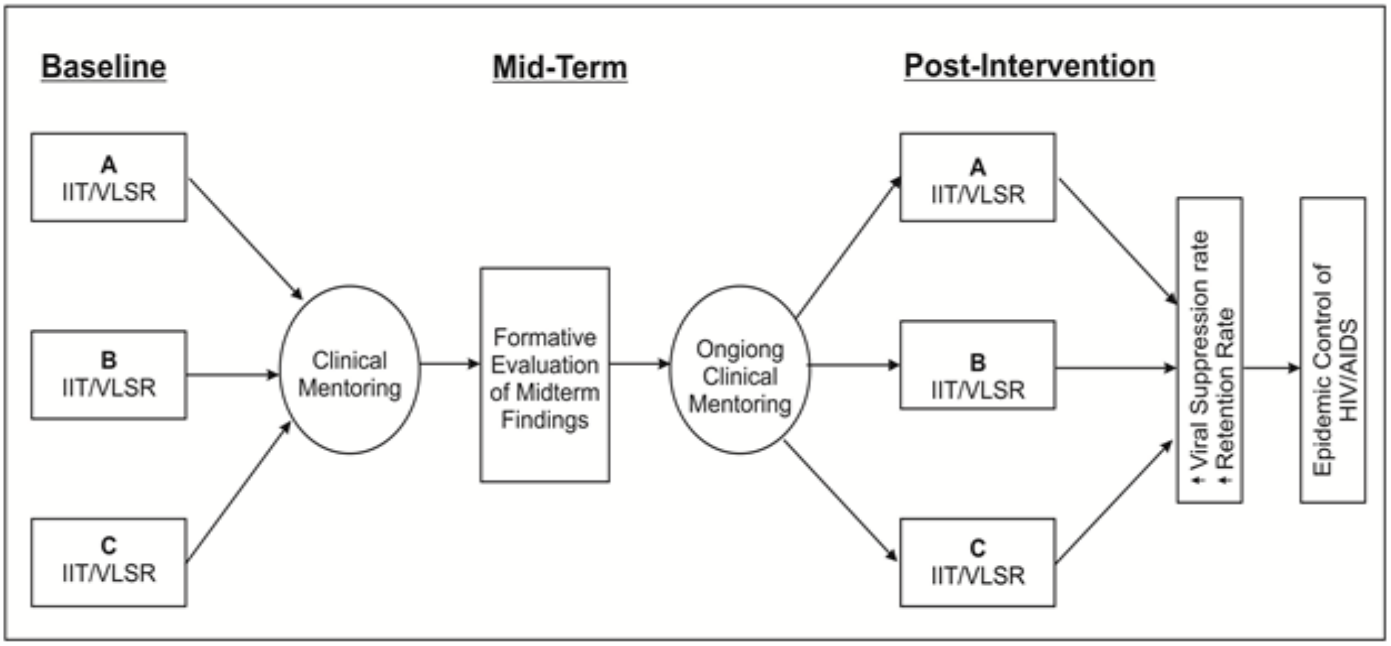

Fig 1 Conceptual Framework
IIT = Interruption in Treatment; VLSR = Viral Load Suppression Rate

The research paradigm above is the logical illustrative sequence of how interventions that will be deployed in the form of HIV clinical mentoring in the prevention, treatment and care cascade may influence the dependent variables in this two-tailed research work.

APPENDIX 2

Table 1: Mean Scores, Standard Deviations and Standard Error of Means by Study Status

Study Status		Mean	N*	SD**	SEM***
Pair 1	Baseline IIT	0.0733	15	0.12228	0.03157
	Midterm IIT	0.2867	15	0.87249	0.22528
Pair 2	Baseline IIT	0.0733	15	0.12228	0.03157
	Post Intervention IIT	0.0000	15	0.00000	0.00000
Pair 3	Baseline Viral Load	93.6667	15	4.15188	1.07201
	Midterm Viral Load	88.8667	15	14.25716	3.68118
Pair 4	Baseline Viral Load	93.6667	15	4.15188	1.07201
	Post Intervention Viral Load	90.2667	15	9.05118	2.33700
*Sample size; **Standard deviation; ***Standard error of mean.					

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APPENDIX 3

Table 2: Paired t-test for IIT Rates/Viral Suppression Rates by Study Status

Study Status		Paired Differences					t-test	df*	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Baseline IIT - Midterm IIT	-.21333	.87167	.22506	-.69605	.26938	-.948	14	.359
Pair 2	Baseline IIT - Post Intervention IIT	.07333	.12228	.03157	.00562	.14105	2.323	14	.036
Pair 3	Baseline Viral Load - Midterm Viral Load	4.80000	14.97236	3.86585	-3.49141	13.09141	1.242	14	.235
Pair 4	Baseline Viral Load - Post Intervention Viral Load	3.40000	9.18695	2.37206	-1.68756	8.48756	1.433	14	.174

*Degree of freedom