

Original Research Article

Is adherence to antiretroviral therapy by recipients of HIV care and treatment receiving care in Akwa Ibom state, Nigeria determined by their behaviors? A cross-sectional study

Ime Usanga¹, Remi A. Oladigbolu^{2*}, Emem Xavier¹, Donald Akpenna³, Usen Daniel¹,
Adewale Akinjeji², Irene Esu⁴, Prince Obinna Anyanwu², Abah Ehiowoicho Peter³,
Chinyerem Immanuel², Adetunji Adedokun², Valentine Nnamdi Nnanna²,
Claire Majekodunmi³, David Iniama Ekpenyong², Friday Abbah², Mmenyene-Abasi Udom²,
Janet Olude², Henry Afamefune Nwafejeokwu³, David Orojo²

¹State AIDS/STI Control Program, Akwa Ibom State Ministry of Health, Nigeria

²ICAP Global Health, Akwa Ibom, Nigeria

³Jhpiego, Ankuru, Federal Capital Territory, Nigeria

⁴National AIDS/STI Control Program (NASCP), Abuja, Nigeria

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*Correspondence:

Dr. Remi A. Oladigbolu,

E-mail: remiolad7@gmail.com

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ABSTRACT

Background: There has been limited use of stage of change model in scaling up self-care for optimal adherence to ART. The study aimed to assess the pattern of behavior and its associated factors among recipients of care (RoC) receiving treatment in Akwa Ibom state, Nigeria.

Methods: A descriptive cross-sectional study was conducted among 423 RoC between August and October 2022. The pattern of behavior of RoC was determined using descriptive statistics, and factors associated with behavior were assessed using chi-square analysis and subsequently binary logistic regression at an alpha level of <0.05 at a 95% confidence interval using SPSS version 25.

Results: Out of 423 recipients on care interviewed, 85% were in maintenance phase, and 13% in action phase. The correlates of behaviors of RoC were HIV diagnosis and on ART for over a year ($p < 0.001$), residing in rural settings ($p < 0.001$), and those in clinically stable DSD models ($p < 0.001$). Over 87% of those in maintenance phase were adherent to ART, however, this was not statistically significant ($p = 0.21$).

Conclusions: Almost all the RoC were in good behavior and majority of them were adherent to ART. The factors associated with behavior of recipients of care were those diagnosed and on ART for over a year, residing in rural settings, and those in clinically stable differentiated service delivery (DSD) models. Interventions that utilize stage of change model to scale up the self-care of RoC particularly among those in the urban settings is highly imperative.

Keywords: Akwa Ibom state, ART, HIV/AIDS, Nigeria, Stage of Change model

INTRODUCTION

HIV/AIDS remains an incurable pandemic disease with over 38 million infected globally and 70% resides in sub-

Saharan Africa.¹ Several interventions instituted globally and Nigeria in particular, had significantly resulted in a reduction in the burden of the disease. Nigeria currently has 1.4% (1.9 million) of his reproductive age group (15-

49-year-old) living with the disease that has to be on sustainable lifelong antiretroviral therapy (ART).² Despite the tremendous efforts by the multilateral organizations over several decades in the development of potent antiretrovirals (ARVs) with fewer side effects, low pill counts, highly tolerable by patients and high threshold to resistance like the dolutegravir-based regimen, every recipient of care (RoC) on medication needs the right behavior to support their adherence to ART.

Human behavior is defined as the practical voluntary movement and the purposive act arising out of decision taken by an individual.³ This has been repeatedly identified as a vital determinant of health by several authors, needed to achieve a healthy living through health promotion, disease prevention, maintenance of health and rehabilitation.⁴ A good behavior is an imperative determinant of adherence to ART (taking 95% and above of prescribed ARVs), which has been proven as the strongest predictor and most important modifiable attribute of viral load suppression, and undetectable viremia (viral load <50 copies/ml.) for recipients of care.⁵ Poor adherence to ART has serious consequences for HIV-infected patients- their sexual partners, children and community at large, including failure to prevent viral replication, an increased likelihood of developing viral resistance, the development of clinical complications, and shortened survival.⁶⁻⁸

In order to seamlessly support the adherence to ART amongst recipients of care, reaching impact saturation and epidemic control (RISE) of HIV/AIDS in Akwa Ibom state, a five (5) years USAID funded project jointly implemented by ICAP and Jhpiego instituted several interventions at the beginning of FY 21 (October, 2020) that included the use of cost-effective behavioral models. stage of change model (transtheoretical model) by Prochaska and DiClemente was utilized to evolve the behaviors of recipients of care from pre-contemplation, contemplation, preparation to action and preferably, maintenance phases and having systems in place that will prevent relapse.⁹ The stages of change model describes the progression of cognitions and strategies adopted by individuals as they change behaviours and includes the following phases: precontemplation (not considering changing behaviour in the next 6 months), contemplation (considering changing behaviour in the next 6 months), planning (planning on changing behaviour in the next 6 months), action (currently changing behaviour), and maintenance (successful behaviour change in the past 6 months).¹⁰ This model has been validated among new recipients of care on ART and has been proven to be a determinant of adherence to ART and viral load suppression.^{11,12} The study aimed to assess the pattern of good behavior and its determinants among recipients of care receiving treatment in Akwa Ibom state, Nigeria.

METHODS

The study was conducted in Akwa Ibom state- the epicenter of HIV/AIDS with 5.6% of its reproductive populace with the disease.² RISE supports the state on HIV/AIDS care and treatment in the ten (10) northern local government areas (LGAs), and these are namely- Abak, Ikot Ekpene, Essein Udim, Ika, Ibiono, Etim Ekpo, Ini, Ikono, Itu, and Obot Akara LGA. The study took place between August and October 2022 by the Akwa Ibom State AIDS and STI Control Program (SASCP) with the support of the staff of RISE in the state.

This study utilized a descriptive cross-sectional study design and the study population comprised of recipients of HIV/AIDS care receiving ART treatment at RISE supported health facilities in Akwa Ibom state. Using the formula for cross sectional study and a prevalence of 72% for patients' adherence to ART from a previous study, and at least 80% response rate, a total of 423 respondents were recruited into the study using a multi-stage sampling technique- first, a cluster sampling was used to select hub (with community ART program) health facilities (10) amongst all the 61 RISE supported health facilities; a simple random sampling was used to select five (5) health facilities amongst the hub facilities and finally a systematic sampling technique with proportional allocation was used to recruit the study participants.^{13,14}

Inclusion criteria were all recipients of care age ≥ 18 years receiving ART and patients who refused to participate in the study were excluded. Android phones with installed kobocollect software containing the questionnaire, was used to obtain information on respondents' socio-demographic characteristics, patients' adherence to ART (using self-report) and their level of behavior measured using the stage of change model.

The questionnaires were administered by trained research assistants (RAs) using an android phone after obtaining informed consent from the respondents. The responses from the questions were entered into and analyzed using Statistical Package for Social Sciences (IBM SPSS) statistical software package version 25. Analysis of data included description of data using mean and standard deviation for quantitative variables, counts and frequencies for qualitative variables. A descriptive statistic was used to assess the level of behavior as measured by the stage of change (pre-contemplation to maintenance) and this was further dichotomized to those that were consistently adhering to their medications (action and maintenance phases) and those who were not (pre-contemplation, contemplation and preparation). Adherence to ART was assessed using self-report (quantitative) and a recipient of care was adherent if he or she had not missed a dose of ART in the preceding week before the study was conducted. Those that had missed any dose of ART were not adherent to care. The reasons for missing doses of ART were obtained. Chi-square test was used to assess the association between categorical

independent variables and behavioral status (using stage of change model). Binary logistic regression was used to assess the determinants of behavior of recipients of care at alpha level of <0.05 and 95% confidence interval (CI).

Ethical approval for this study was obtained from the ethical committee of the Akwa Ibom State Ministry of Health. Permission to conduct the study was obtained from the Management of the five (5) selected hub

facilities while informed consent was obtained from all participants in the study.

RESULTS

Majority 314 (77.1%) of the respondents were between 20-59 years-old, and over half of them were female 243 (57.4%), married 224 (53.2%), and resided in rural setting 246 (58.3%) (Table 1).

Table 1: Sociodemographic characteristics of respondents.

Variables	Frequency (%)
Age (years)	
20-24	25 (6.1)
25-49	314 (77.1)
≥50	68 (16.7)
Mean±SD	38.2±12.2
Sex	
Female	243 (57.4)
Male	180 (42.6)
Religion	
Christianity	421 (99.8)
African traditional religion	1 (0.2)
Employment status	
Unemployed	47 (11.1)
Trader	115 (27.3)
Farmer	50 (11.8)
Civil servant	23 (5.5)
Self-employed	127 (30.1)
Apprentice	19 (4.5)
Others	41 (9.7)
Marital status	
Divorced	5 (1.2)
Married	224 (53.2)
Separated	8 (1.9)
Single	151 (35.9)
Widowed/widower	27 (6.4)
Co-habiting	6 (1.4)
Place of residence	
Rural	246 (58.3)
Semi-urban	94 (22.3)
Urban	82 (19.4)

Table 2: HIV parameters of respondents.

Variables	Frequency (%)
HIV diagnosis (months)	
≤6	19 (4.5)
7-12	19 (4.5)
>12	386 (91.0)
ART regimen	
Tenofivir + Lamivudine + Dolutegravir (TLD)	134 (98.5)
Abacavir+ Lamivudine + Dolutegravir	2 (1.5)
ART refill model	
Community	246 (58.3)
Facility	176 (41.7)
Stage of change model	
Poor behavior	2 (0.4)

Continued.

Variables	Frequency (%)
Good behavior	417 (99.5)
Adherent to ART	
Yes	364 (86.7)
No	56 (13.3)
Reasons for missed drugs	
Exhausted drugs	1 (1.8)
Forgot	38 (67.9)
Travelled	7 (12.5)
Others	10 (17.9)
Viral load (<1,000 copies/ml)	
Unsuppressed	26 (8.7)
Suppressed	273 (91.3)

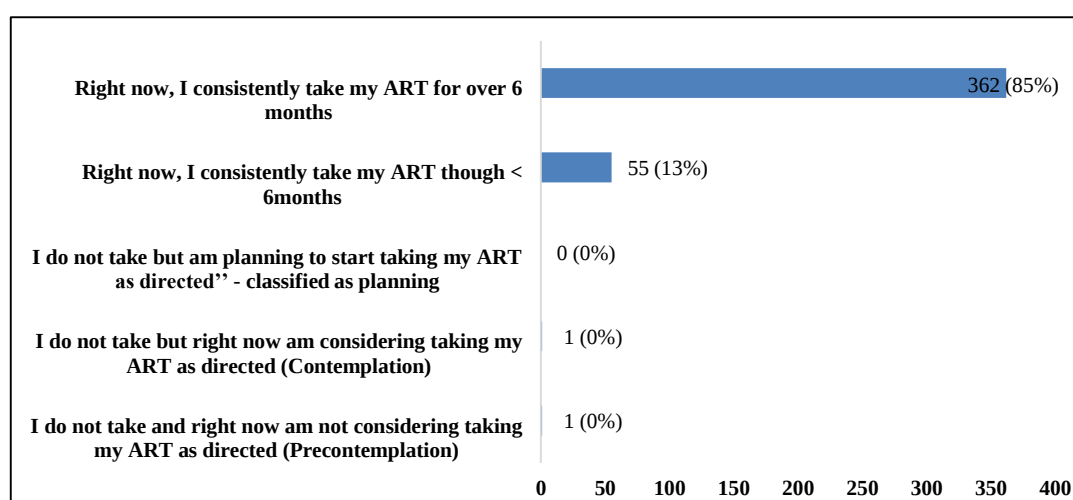


Figure 1: Pattern of stage of change model among respondents.

Almost all the respondents were diagnosed of HIV/AIDS for over a year 386 (91.0%), on TLD 134 (98.5%), and had suppressed viral load 273 (91.3%). The prevalence of good behavior (action and maintenance) was 99.5%, and majority of them were adherent to their ART 364 (86.7%), and the major reasons for missing their ART was due to forgetfulness 38 (67.9%) (Table 2).

Majority 362 (85%) of the respondents were in maintenance phase- that is they had been taking their ART consistently for over 6 months (Figure 1).

The correlates of good behavior among respondents were months of HIV diagnosis, place of residence, and DSD

categories. Almost all 349 (96.4%) the respondents in maintenance phase were diagnosed of HIV and had been on ART for over a year. Most of 221 (61%) the respondents in the maintenance phase resided in rural settings. Similarly, almost all 338 (98.8%) the respondents in the maintenance phase were in clinically stable DSD models, and all these were statistically significant. However, the association between adherent to ART and their behavior using stage of change model was not statistically significant despite having majority of 316 (87.3%) the respondents in the maintenance phase adhering to ART (no missed doses) ($p=0.21$) (Table 3).

Table 3: Factors associated with behavior among respondents.

Variables	Precontemplation N (%)	Contemplation N (%)	Action N (%)	Maintenance N (%)	Test statistics
Sex					
Female	1 (0.4)	1 (0.4)	25 (10.4)	214 (88.8)	$\chi^2=5.8$
Male	0 (0.0)	0 (0.0)	30 (16.9)	148 (83.1)	$p=0.121$
Diagnosed HIV (months)					
≤6	0 (0.0)	1 (100.0)	15 (27.3)	3 (0.8)	$\chi^2=70.9$
7-12	0 (0.0)	0 (0.0)	8 (14.5)	10 (2.8)	$p<0.001^*$
>12	1 (100.0)	0 (0.0)	32 (58.2)	349 (96.4)	

Continued.

Variables	Precontemplation N (%)	Contemplation N (%)	Action N (%)	Maintenance N (%)	Test statistics
Place of residence					
Rural	0 (0.0)	0 (0.0)	22 (40.0)	221 (61.0)	$\chi^2=26.3$
Semi-urban	0 (0.0)	1 (100.0)	9 (16.4)	84 (23.2)	$p<0.001^*$
Urban	1 (100.0)	0 (0.0)	24 (43.6)	57 (15.7)	
DSD categories					
Unstable	0 (0.0)	1 (100.0)	12 (21.8)	4 (1.2)	$\chi^2=39.3$
Stable	1 (100.0)	0 (0.0)	43 (78.2)	338 (98.8)	$p<0.001^*$
Adherent to ART					
Yes	1 (100.0)	0 (0.0)	47 (85.5)	316 (87.3)	$\chi^2=4.5$
No	0 (0.0)	1 (100.0)	8 (14.5)	46 (12.7)	$p=0.21$

Test statistics- chi square; * $p<0.05$.

Binary logistic regression revealed no determinants of behaviors of respondents.

DISCUSSION

Studies have shown that social and behavioural theories can guide the development and evaluation of interventions to improve medication adherence through patient-specific approaches. The transtheoretical model (also known as the stages of change model) developed by Prochaska and colleagues forms the foundation for the stages of change scale and the model was originally developed to tackle the behaviours associated with smoking cessation but has been applied to several other lifestyle change areas.^{11,15,16} This scale was used to assess readiness to implement positive health changes. Adherence to medications is an imperative health behaviour for managing chronic conditions and regarding antiretroviral therapy (ART), it is the strongest predictor of viral suppression and undetectable viremia for recipients of HIV care and treatment.^{17,1}

Our study reported that 362 (85%) of the respondents were in maintenance phase; 55 (13%) of them were in action phase; none of them was in planning phase; and only 1 (0%) was in contemplation and precontemplation phase respectively. Furthermore, the prevalence of good behavior (action and maintenance phase) was 99.5%. The findings in this study is consistent with that reported by Genberg and colleagues in Rhode Island in 2013 that reported proportion of patients classified as pre-contemplation at each study visit ranged from 0-1%, between 4-9% for contemplation, between 6-10% for planning, between 15-31% for action, and between 49-66% for maintenance- with majority of the respondents in action and maintenance phase (64-97%).¹⁴ This is also consistent with findings from a study by Tamburrino and colleagues among clients on antidepressants medication in Toledo, USA.¹⁹ The pattern of behavior among respondents is good since almost all of them have been in care for over a year where several strategies have been implemented overtime to render quality and comprehensive care and treatment and also scale up the self-care of recipients of care.

The prevalence of adherence to ART is high with 86.7% of the respondents reported not missing any dose of their ART. This was similar to 87.9% adherence to ART reported in Jos, Plateau state, but higher than 68.9% reported in Abuja, 60.5% in Benin city and 78.4% reported in Togo, a country also in West Africa, and significantly higher than 26.67% reported in a recent study from Senegal.²⁰⁻²³ The study also reported the major reason for missing ART was forgetfulness. This is consistent with a study by Oladigbolu and colleagues in Sokoto State, northwestern Nigeria.²⁴ Forgetfulness is the single most important factor responsible for nonadherence to ART which is corroborated by findings from this and other studies.^{25,26}

The factors associated with behavior of recipients of care were months of HIV diagnosis, place of residence, and DSD categories. Almost all the respondents in maintenance phase have been on ART medications for over a year. Similarly, almost all the respondents in the maintenance phase were in clinically stable differentiated service delivery (DSD) models. Adoption of positive and favorable behaviors may take time as human behavior is seen as a process and not an event. Using the stage of change model (transtheoretical model), for recipients of care to be in maintenance phase, their self-care would have been optimized leading to better adherence to ART. This will result in recipients of care being established on ART- clinically stable with little or no symptoms and signs of the disease, and more objective treatment outcomes (suppressed or undetectable viral load). The National DSD guideline recommends the devolution of stable recipients of care to one form of DSD- facility or community, to relieve the burden on health facility structure (human resource, and infrastructures), improve the quality of care, and more client-centric in care and treatment approaches.²⁷ Furthermore, the guideline aims to improve adherence to care and better treatment outcome while serving as guidance for tailored interventions that will enable the nation meet the UNAIDS global 95-95-95 goals and achieve epidemic control.²⁷

The study reported that most (61%) of the respondents in maintenance phase of their behavior resided in the rural settings. This implies there are more likely to have the self-care needed for adherent to ART. Majority of the respondents in maintenance phase of their behavior were adherent to ART. However, this was not statistically significant and may be due to lower power in the chi square analysis for some of the cells. This is in contrast to a randomized control trial done in the United States of America by Genberg and colleagues who reported that classification into the earlier stages of change (i.e., pre-contemplation, contemplation, and planning) was associated with significantly lower adherence scores when compared with more progressed stage-of-change classification (i.e., action and maintenance).¹⁴ Recipients of care in earlier phases of the stages of change may not have been committed to taking ART when they initiated treatment, or they may have “relapsed,” or dropped out of the action/maintenance phase at some point during their treatment history. Hence, they are more likely to benefit from adherence counselling tailored to the benefits and adverse effects of treatment to correct misconceptions and myths about the therapy, and address the underlying issues that are preventing them from fully engaging in care.

CONCLUSION

This study reported that 99.5% of recipients of care had good behavior and 86.7% of them were adherent to ART. The factors associated with behavior of recipients of care were those diagnosed and on ART for over a year, residing in rural settings, and those in clinically stable differentiated service delivery (DSD) models. Interventions that seamlessly utilize stage of change model to scale up the self-care of recipients of care to optimize adherence to ART is highly imperative. This should also include strategies aimed at pre-emptively addressing forgetfulness, the most commonly reported reason for poor adherence to ART. Additionally, the full implementation of the National DSD guide will further support the self-care of recipients of care, foster access to client-centric care and treatment, and sustain good behavior.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of the Akwa Ibom State Ministry of Health

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