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Original Research Article

Assessment of knowledge of differentiated service delivery among HIV-positive patients receiving care in a Southeastern Nigerian State

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ABSTRACT

Background: Since the adoption of the differentiated service delivery (DSD) as a programmatic strategy in the delivery of antiretroviral therapy (ART) in Imo state, no research has assessed the level of knowledge of DSD among HIV-positive patients receiving ART in the state, a research gap which this study aimed to fill.
Methods: This was a cross sectional study carried out among the adult patients receiving ART in three DSD models and the usual care group at one tertiary and three secondary hospitals using a structured questionnaire validated by the researcher. Descriptive and inferential analyses were performed using the statistical product and service solutions (SPSS) version 24. All the analysis was performed at $p \leq 0.05$.
Results: Of the 542 questionnaires retrieved, the female gender was predominant in all the groups. Up to 57.3% and 55.5% of the patients had good knowledge and perception towards differentiated care respectively. A significant difference was found in the mean perception among the groups ($F(3.538)=9.309$, $p<0.05$). While education and participation in HIV activities were found to be significant predators of knowledge of DSD, ($F(10.466)=3.082$, R^2 of 0.062, $p<0.05$), only education was found to be determinant of perception.
Conclusions: This study has shown that the patients had fair knowledge of the DSD in all the models examined, as well as the usual group; and this did not differ significantly across the groups. However, there is need to improve on patients' enlightenment of the initiative, especially for those in the usual care group.

Keywords: DSD, ART, Knowledge, Eligibility

INTRODUCTION

At the end of 2021, global percentage of people living with HIV that access ART had increased to the 75% (66-85%) from the 25% (22-29%) it was in 2010.[1] This increased access to antiretrovirals and retention in care, however, resulted to overcrowding in healthcare facilities, high and rising patient workload contributed to by largely stable clients, longer waiting times during visits, and reduced time for counseling and clinical care of the newly enrolled patients.[2]

The challenges of clinic congestion, poor linkage to care, poor access to ARVs, and loss to follow up (TLFU) and the need to execute the "test and treat" recommendation and USAIDS 90-90-90 target initiatives have necessitated new programmatic reforms in HIV treatment.

There is broad agreement that a ''one-size-fits-all'' model of HIV services will not succeed in providing sustainable access to ART and support services for the 37 million people living with HIV (PLHIV) presently. Hence, various health systems should adapt suitable HIV services for specific patients' populations. Over the past

decade, a range of innovative strategies to enhance retention and adherence to ART have been documented. These programmatic adaptations have been described as ways of "differentiating" how ART is delivered.[3]

Part of the programmatic reforms was the introduction of the DSD innovative approach. "Differentiated care is a client-centred approach that simplifies and adapts HIV services across the cascade in ways that both serve the needs of PLHIV better and reduce unnecessary burdens on the health system".[4] DSD, also called differentiated care, optimized care, patient-centred/focused care, or needs-based care, incorporates concepts such as simplification, task shifting and decentralization. By implementing this method of care, health system can refocus resources to patients in need while reducing facility overcrowding, stable patients waiting times during visit, and increasing time for counseling and caring of newly diagnosed HIV patients. This new service delivery model is aimed at enhancing the quality of the client experience, putting the client at the centre of service delivery while ensuring that the health system is functioning in both a medically accountable and efficient manner.[4]

There are various models of DSD currently adopted in across states in Nigeria, and beyond. In differently countries, certain criteria are used in determining the eligibility of a client to be enrolled into a DC model. In the event that a client does not meet the criteria, such person is retained in the usual care group. For instance, in Kenya, age of 20 years or Body Mass Index (BMI) of not less than 18.5, complete one year of treatment on current regimen, not having active opportunistic infections in the last 6 months, adherent to scheduled clinic appointments for the last 6 months, completing 6 months of Isoniazid preventive therapy (IPT), good viral load (VL) suppression in last 6 months, not be pregnant or breastfeeding, are the eligibility criteria.[5] Similar criteria were used in differentiating patients in Malawi (UNAIDS, 2017) and several other countries.[6] Presently, several studies have been conducted to ascertain the extent of implementation of DSD and its impact on adherence to ART or patients satisfaction. However, no study has been carried out to assessment patients' level of knowledge of the DSD, especially in Nigeria.

Poor knowledge of the differentiated care models could result in resistance or inertia to accept and embrace the treatment initiative which will pace way for easy enrolment into the client-preferred model of differentiated care. In addition, having poor knowledge of the concept will result to poor perception of the initiative and the models by the patients receiving ART. Lack of medical knowledge in patients has been found to affect willingness to participate in the health care process.[7]

The aim of this study was therefore to assess knowledge level of DSD among patients receiving ART in Imo state Nigeria.

METHODS

Study setting

Imo state is one of the five states that make up south eastern part of Nigeria. The research was conducted in four hospitals spread across the three senatorial zones of the state, Nigeria. These include: Imo State university teaching hospital, Umuna, Orlu; general hospital, Awomamma; Holy Rosary hospital, Emekukwu; and general hospital, Okigwe.

These hospitals provide comprehensive HIV care in the state. They are located in the urban, semi-urban and rural parts of the state.

Study design

This research was a cross-sectional study. Adults patients receiving ART on three differentiated care models (multiple months scripting, fast tract and support group) and those on the usual care group were assessed.

Sample size

The sample size for the study was determined using Raosoft sample size calculator.[8] Given that there are approximately 4000 patients were on ART in the four hospitals used in the study. On the basis of the most conservative response distribution of 50%, allowing 0.5% margin of error at 95% confidence interval, the required sample size was calculated to be 351. However, the number was increased to 600.

Inclusion criteria

Participants must be HIV positive, every participant must belong to either of the three differentiated groups examined or is in the usual care category. HIV-positive patients who have taken antiretroviral drugs (ARD) for at least three months, patients must adults, only outpatients were allowed to participate and participants must be non-pregnant were included.

Exclusion criteria

Patients who were on admission, all paediatric or adolescent patients, any patient who declined to give consent to participate in the study and patients who were mentally unstable were excluded.

Data collection

The data were collected using the structured questionnaire developed by the researcher. The questionnaire was self-administered to the patients. During each visit to the clinics, the questionnaires were given to the participants to fill. After filling, they were collected at the spot. Those in support group were approached during their periodic gatherings.

Study period

This study was conducted from March 2022 to August 2022, hence, it lasted for six months.

Statistical analysis

The collated data were first entered into Microsoft Excel and cross-checked for errors and omissions, and later imported into the statistical product and service solution (SPSS) version 24 for analysis. Descriptive statistics comprising the frequency, mean percentage, and standard deviation, were used to analyse the data. The knowledge questions were scored 1 for correct answer and 0 for incorrect or not sure answers, and aggregate scores were computed for the fourteen items questions. Mean scores were calculated and values equal or above the mean scores were considered good knowledge while values below the mean scores were considered poor. One-way ANOVA test was used to compare the mean scores of knowledges of respondents in different care models and the usual care group.

Influence of socio-demographics on patients' knowledge of differentiated care determined using multiple linear regression model. All analysis performed at $p \leq 0.05$.

Ethical considerations

Ethical approval for the research was obtained from the ethical committee of Imo State university teaching hospital, Umuna, Orlu, Imo State and The State AIDS and STI program control, department of public health, Imo State ministry of health, Owerri. In addition, written permissions were obtained from the management of each study facility. Patients' consent was sought before their participation in the study.

RESULTS

Demographic characteristics of the patients

A total of 542 questionnaires were successfully retrieved from the respondents, giving a response rate of 90%. The female gender is predominant in all the groups, accounting for total average of 70.8%. In the age distribution, the highest population were found within the range of bracket of 36-45 years (Table 1).

Patients' knowledge of the differentiated care

Table 2 below show the result of patients' knowledge of differentiated care. Mean knowledge score for all the respondents was 41.1%, and the respondents whose scores were equal or above this value were considered to have a good knowledge while those whose scores were lower than the mean score were considered as having poor knowledge of the differentiated care. More than half of the patients 310 (57.3%) had good knowledge of differentiated care. The highest and lowest percentages of patients with good knowledge of differentiated care was found in the support group (61.4%) and usual care group (46.4%) respectively.

Multiple comparisons of mean knowledge among the different care groups.

The percentage mean knowledge scores of the respondents in the different care groups were compared using one-way ANOVA. No significant difference was found $F(3,538)=1.46$, $p>0.05$). The percentage mean scores for the four groups did not differ significantly from each other.

Prediction of knowledge based on patients' socio-demographics using multi-linear regression.

A significant regression equation was found $F(10,466)=3.082$, $p<0.05$), with an R^2 of 0.062.

Regression equation:

$$Respondents\ knowledge = 2.33Edu + 6.603Participation\ in\ HIV\ activities + 32.37$$

Where educational status is coded as 1=None, 2=Elementary, 3=Secondary, 4=OND, HND, 5=Degree, 6=Postgraduate (Masters, PhD); and participation in HIV activities coded as 1=Yes, 0=No.

Subjects' knowledge of differentiated care increases by 2.330 by a unit increase in educational qualification. Similarly, participation in HIV activities caused an increment of 6.603 in knowledge of differentiated care compared non-participation in HIV activities.

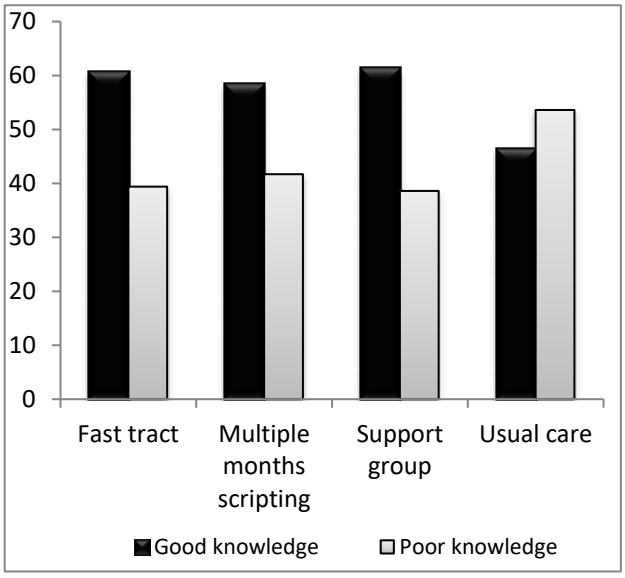

Figure 1: A pictorial representation of patients groups' good and poor knowledge of differentiated care.

Table 1: Socio-demographic characteristics of the respondents.

Characteristics	Total group, (n=542) (%)	Fast track group, (n=155) (%)	Multiple month scripting group, (n=163) (%)	Support group, (n=114) (%)	Usual care group, (n=110) (%)	Chi-square test, p value
Gender						
Female	384 (70.8)	107 (69)	112 (68.7)	93 (81.6)	72 (65.5)	0.037
Male	158 (29.2)	48 (31)	51 (31.3)	21 (18.4)	38 (34.5)	
Age (In years)						
20-25	42 (7.7)	18 (11.6)	11 (6.7)	0 (0.0)	13 (11.8)	<0.001
26-35	127 (23.4)	36 (23.2)	36 (22.1)	28 (24.6)	27 (24.5)	
36-45	166 (30.6)	56 (36.1)	50 (30.7)	23 (20.2)	37 (33.6)	
46-55	118 (21.8)	24 (15.5)	41 (25.2)	32 (28.1)	21 (19.1)	
56-65	60 (11.1)	17 (11)	21 (12.9)	11 (9.6)	11 (10)	
66-75	27 (5)	4 (2.6)	2 (1.2)	20 (17.5)	1 (0.9)	
76-85	1 (0.2)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)	
Marital status						
Divorced	11 (2)	1 (0.6)	3 (1.8)	0 (0.0)	7 (6.4)	<0.001
Married	289 (53.3)	93 (60)	90 (55.2)	52 (45.6)	54 (49.1)	
Single	134 (24.7)	48 (31)	37 (22.7)	20 (17.5)	29 (26.4)	
Windowed	106 (19.6)	12 (7.7)	32 (19.6)	42 (36.8)	20 (18.2)	
Education						
None	20 (3.7)	5 (3.2)	8 (4.9)	2 (1.8)	5 (4.5)	<0.001
Elementary sch	158 (29.2)	35 (22.6)	51 (31.3)	48 (42.1)	24 (21.8)	
Secondary sch	258 (47.6)	67 (43.2)	75 (46)	62 (54.4)	54 (49.1)	
OND or NCE or HND	57 (10.5)	19 (12.3)	20 (12.3)	2 (1.8)	16 (14.5)	
Degree	44 (8.1)	27 (17.4)	8 (4.9)	0 (0.0)	9 (8.2)	
PhD	4 (0.7)	2 (1.3)	0 (0.0)	0 (0.0)	2 (1.8)	
Employment status						
Studying	22 (4.1)	10 (6.5)	8 (4.9)	0 (0.0)	4 (3.6)	<0.001
Working	410 (75.6)	119(76.8)	115 (70.6)	97 (85.1)	79 (71.8)	
Unemployed	106 (19.6)	25 (16.1)	38 (23.3)	17 (14.9)	26 (23.6)	
Retirees	1 (0.2)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)	
Participation						
No	403 (74.4)	96 (61.9)	127 (77.9)	94 (82.5)	86 (78.2)	<0.001
Yes	103 (19)	35 (22.6)	29 (17.8)	20 (17.5)	19 (17.3)	
Voluntary						
No	401 (74)	83 (53.5)	130 (79.8)	104 (91.2)	84 (76.4)	<0.001
Yes	117 (21.6)	59 (38.1)	26 (16)	10 (8.8)	22 (20)	
Residence						
City	70 (12.9)	19 (12.3)	28 (17.2)	0 (0.0)	23 (20.9)	<0.001
Town	108 (19.9)	52 (33.5)	21 (12.9)	10 (8.8)	25 (22.7)	
Village	356 (65.7)	81 (52.3)	110 (67.5)	104 (91.2)	61 (55.5)	
Economic status						
Better than others status	98 (18.1)	23 (14.8)	39 (23.9)	9 (7.9)	27 (24.5)	<0.001
Like the others	202 (37.3)	44 (28.4)	46 (28.2)	74 (64.9)	38 (34.5)	
Somewhat better than others	158 (29.2)	47 (30.3)	51 (31.3)	28 (24.6)	32 (29.1)	
Somewhat worse than others	44 (8.1)	17 (11)	16 (9.8)	3 (2.6)	8 (7.3)	
Worse than others	18 (3.3)	6 (3.9)	7 (4.3)	0 (0.0)	5 (4.5)	

Table 2: Patients knowledge of differentiated care.

Items and characteristics		Total group, (n=542) (%)	Fast track group, (n=155) (%)	Multi-month scripting group, (n=163) (%)	Support group, (n=114) (%)	Usual care group, (n=110) (%)	P value
Differentiated care models in HIV/AIDS treatment means providing diff. levels of care to patients according to their medical needs	Correct	352 (64.9)	121 (78.1)	98 (60.1)	76 (66.7)	57 (51.8)	<0.001
	Incorrect	190 (35.1)	34 (21.9)	65 (39.9)	38 (33.3)	53 (48.2)	
	Mean (SD)	0.6 (0.5)	0.8 (0.4)	0.6 (0.5)	0.7 (0.5)	0.5 (0.5)	<0.001
To be eligible for enrolment into differentiated care models, patients must have been on ARD drugs for 12 consecutive months	Correct	211 (38.9)	67 (43.2)	82 (50.3)	24 (21.1)	38 (34.5)	<0.001
	Incorrect	331 (61.1)	88 (56.8)	81 (49.7)	90 (78.9)	72 (65.5)	
	Mean (SD)	0.4 (0.5)	0.4 (0.5)	0.5 (0.5)	0.2 (0.4)	0.3 (0.5)	<0.001
Only patients on 1st line ARD eligible for enrolment into diff. care models	Correct	133 (24.5)	42 (27.1)	52 (31.9)	11 (9.6)	28 (25.5)	<0.001
	Incorrect	409 (75.5)	113 (72.9)	111 (68.1)	103 (90.4)	82 (74.5)	
	Mean (SD)	0.2 (0.4)	0.3 (0.4)	0.3 (0.5)	0.1 (0.3)	0.3 (0.4)	<0.001
Pregnant women are not eligible for enrolment into differentiated care models.	Correct	132 (24.4)	39 (25.2)	45 (27.6)	18 (15.8)	30 (27.3)	0.11
	Incorrect	410 (75.6)	116 (74.8)	118 (72.4)	96 (84.2)	80 (72.7)	
	Mean	0.2 (0.4)	0.3 (0.4)	0.3 (0.4)	0.2 (0.4)	0.3 (0.4)	<0.001
Patient's CD4 count should be above 500 cells/mm^3 for patient to be enrolled into differentiated care.	Correct	162 (29.9)	47 (30.3)	68 (41.7)	10 (8.8)	37 (33.6)	<0.001
	Incorrect	380 (70.1)	108 (69.7)	95 (58.3)	104 (91.2)	73 (66.4)	
	Mean (SD)	0.3 (0.5)	0.3 (0.5)	0.4 (0.5)	0.1 (0.3)	0.3 (0.5)	<0.001
For a patient to be enrolled into differentiated care model, person must have reached 18 years of age.	Correct	129 (23.8)	30 (19.4)	62 (38)	10 (8.8)	27 (24.5)	<0.001
	Incorrect	413 (76.2)	125 (80.6)	101 (62)	104 (91.2)	83 (75.5)	
	Mean (SD)	0.2 (0.4)	0.2 (0.4)	0.4 (0.5)	0.1 (0.3)	0.2 (0.4)	<0.001
Clinical consultation appointment is more frequent in Std care than in differentiated care model.	Correct	168 (31)	62 (40)	59 (36.2)	20 (17.5)	27 (24.5)	<0.001
	Incorrect	374 (69)	93 (60)	104 (63.8)	94 (82.5)	83 (75.5)	
	Mean (SD)	0.3 (0.5)	0.4 (0.5)	0.4 (0.5)	0.2 (0.4)	0.2 (0.4)	<0.001
Patients that are not eligible for accessing any of differentiated models of care are withdrawn from HIV treatment completely.	Correct	323 (59.6)	79 (51)	88 (54)	94 (82.5)	62 (56.4)	<0.001
	Incorrect	219 (40.4)	76 (49)	75 (46)	20 (17.5)	48 (43.6)	
	Mean (SD)	0.6 (0.5)	0.5 (0.5)	0.5 (0.5)	0.8 (0.4)	0.6 (0.5)	<0.001
Differentiated care models aim at providing patients with quality HIV service at their convenience.	Correct	300 (55.4)	97 (62.6)	63 (38.7)	94 (82.5)	46 (41.8)	<0.001
	Incorrect	242 (44.6)	58 (37.4)	100 (61.3)	20 (17.5)	64 (58.2)	
	Mean (SD)	0.6 (0.5)	0.6 (0.5)	0.4 (0.5)	0.8 (0.4)	0.4 (0.5)	<0.001
Any health care staff can manage patients in all differentiated care models.	Correct	134 (24.7)	48 (31)	49 (30.1)	0 (0.0)	37 (33.6)	<0.001
	Incorrect	408 (75.3)	107 (69)	114 (69.9)	114 (100)	73 (66.4)	
	Mean (SD)	0.2 (0.4)	0.3 (0.5)	0.3 (0.5)	0 (0)	0.3 (0.5)	<0.001
A patient on differentiated care model does not need to go for clinical consultation even if he or she develops an opportunistic infection	Correct	343 (63.3)	95 (61.3)	87 (53.4)	94 (82.5)	67 (60.9)	<0.001
	Incorrect	199 (36.7)	60 (38.7)	76 (46.6)	20 (17.5)	43 (39.1)	
	Mean (SD)	0.6 (0.5)	0.6 (0.5)	0.5 (0.5)	0.8 (0.4)	0.6 (0.5)	<0.001
In the absence of viral load measurement, CD4 cell counts measurement can be used to evaluate adherence.	Correct	290 (53.5)	81 (52.3)	85 (52.1)	70 (61.4)	54 (49.1)	0.268
	Incorrect	252 (46.5)	74 (47.7)	78 (47.9)	44 (38.6)	56 (50.9)	
	Mean (SD)	0.5 (0.5)	0.5 (0.5)	0.5 (0.5)	0.6 (0.5)	0.5 (0.5)	<0.001
Differentiated care can also be offered to clients who are not consistent with their clinical appointments	Correct	237 (43.7)	56 (36.1)	73 (44.8)	59 (51.8)	49 (44.5)	0.081
	Incorrect	305 (56.3)	99 (63.9)	90 (55.2)	55 (48.2)	61 (55.5)	
	Mean (SD)	0.4 (0.5)	0.4 (0.5)	0.4 (0.5)	0.5 (0.5)	0.4 (0.5)	<0.001
ART delivery can be provided at out of hospital facilities through community pharmacies, health posts, home-based services and other community structures.	Correct	204 (37.6)	61 (39.4)	54 (33.1)	45 (39.5)	44 (40)	0.566
	Incorrect	338 (62.4)	94 (60.6)	109 (66.9)	69 (60.5)	66 (60)	
	Mean (SD)	0.4 (0.5)	0.4 (0.5)	0.3 (0.5)	0.4 (0.5)	0.4 (0.5)	<0. 001

Continued.

Items and characteristics		Total group, (n=542) (%)	Fast track group, (n=155) (%)	Multi-month scripting group, (n=163) (%)	Support group, (n=114) (%)	Usual care group, (n=110) (%)	P value
Grouped knowledge	Grouped knowledge						0.074
Good knowledge	Good knowledge	310 (57.2)	94 (60.6)	95 (58.3)	70 (61.4)	51 (46.4)	
Poor knowledge	Poor knowledge	232 (42.8)	61 (39.4)	68 (41.7)	44 (38.6)	59 (53.6)	

P-values are from a Chi-square test for categorical variables, only. The mean knowledge score is 41.091.

Table 3: Comparison of Knowledge of respondents in usual care against those in differentiated care groups

(I) Usual care	(J) Type of differentiated care group	Mean difference (I-J)	Std. Error	Sig.	95% CI	
					Lower bound	Upper bound
Usual care	Multi- month scripting	-3.13162	2.23411	0.162	-7.5203	1.2570
Usual care	Fast track	-3.47088	2.25722	0.125	-7.9049	0.9632
Usual care	Support group	-0.00456	2.41985	0.998	-4.7581	4.7490
Usual care	Fast track	1.32436	0.95915	0.168	-0.5598	3.2085

Table 4: Independent predictors of knowledge of differentiated care.

Independent variables	Unstandardized coefficients		Standardized coef.	T	Sig.	95.0% CI for B	
	B	Std. error	Beta			Lower bound	Upper bound
(Constant)	32.357	6.389		4.981	0.000	19.271	44.382
DMOC	-1.335	0.707	-0.086	-1.900	0.058	-2.734	0.046
Gender	3.137	1.825	0.080	1.725	0.085	-.438	6.736
Age (In years)	0.111	.687	0.009	0.190	0.850	-1.220	1.481
Marital status	-.209	1.198	-0.007	-0.135	0.892	-2.516	2.192
Level of educational	2.330	0.912	0.124	2.524	0.012*	0.510	4.095
Current occupation	-0.539	0.666	-0.041	-0.829	0.408	-1.860	0.756
Participation in HIV activities	6.503	2.258	0.143	2.868	0.004*	2.040	10.916
Do you do voluntary work	-0.365	2.197	-0.010	-0.201	0.841	-4.759	3.877
Reside in the town	-1.017	2.918	-0.023	-0.349	0.728	-6.752	4.718
Reside in the village	-0.290	2.572	-0.008	-0.113	0.910	-5.344	4.765
Economic situation	1.079	0.850	0.060	1.290	0.198	-0.574	2.767

Dependent Variable: Percentage Mean of Knowledge Score

DISCUSSION

This study assessed the knowledge of DSD among clients receiving ART who belong to three models of DSD and the usual care group. Knowledge of DSD was fair in all the models and the usual care group examined, and there was no difference in the knowledge level across the groups. Educational attainment and participation in HIV activities were the significant predictors of knowledge found.

Socio-demographics of respondents

The result of the study revealed that patients across the groups were majorly females (70.8%), and this figure collaborates with a study carried out in Sokoto, Nigeria.[9] Contrarily, studies conducted in Boston and Chandigarh India, showed higher number of males than females.[10,11]

This higher percentage of women seen at the clinics in this study could partly be due to the fact that females are more exposed to the disease or that women were more conscious of their health than men, therefore, tend to seek medical attention more.

The highest number of respondents was found within the age brackets of 26 to 45 years. This in consistent with results of other studies in South Africa and Nigeria which reported highest number of respondents within 30 to 39 years age interval.[12,13]

Patients participation in HIV activities and voluntary works were low across the groups examined in the study. These findings contrast the result of a study in Kenya which revealed that majority of the support group-linked respondents interviewed participated in many activities, these included care and support, psychosocial activities,

income generating activities among others.[14] Findings of this study show that greater percentage of patients who enrolled and participated in the social support groups perceived their economic condition to be at par with that of other members of the society, and none of them perceived their economic condition as being worse than that of other people. This could be one of the positive impacts of social support on the psychological well-being of PLWHA. A study in England which examined the benefits of a social support group for the women reported that support group attendance had resulted in positive changes in PLWHA. The women perceived they had improved cognitively, emotionally, and behaviorally. This had made them become better mothers, more educated, felt less ashamed, and taken better care of themselves.[15] In view of the foregoing, provision of ARV is important but not sufficient to guarantee all round improvements in the well-being of people living with the disease. Treatment of HIV/AIDS disease hence requires a holistic approach that incorporates the continuum of prevention (of opportunistic infections), treatment (of chronic conditions) and care (provision of economic and social support).[16]

Knowledge of differentiated care model

The proportion of patients with good knowledge about differentiated care across the groups was more than those with poor knowledge, though, the groups did not differ significantly in the knowledge level. This implies that many of patients might had been enrolled into the models without proper education by the healthcare providers. It may not be off beam also to attribute the poor knowledge to the factors relating to the health care system, including the conflicting and inconsistent program framework, lack of clear eligibility guideline, mediocre knowledge of the concept by the healthcare providers, reluctance to hold educational series on the differentiated care. Training and re-training health workers on differentiated care and what it means in diverse settings is also very crucial. In contrast to this finding, a study carried in South Africa reported that 95% of the patients considered them knowledgeable about DSD.[17]

Majority of the respondents did not know the criteria for enrolment into the differentiated care and this may have connection with improper differentiation of patients, which is a weakness on the side of the health providers. For instance, an ineligible patient who was enrolled into any differentiated care model will likely be unaware that there are existing criteria for eligibility. They might also opine that the guideline on eligibility had been jettisoned or amended, this could cause them to discontinue or switch to another group without prior notice to their health providers. Knowledge of the inclusion criteria for DMOC is not only important to the care providers, but also to the patients. Poor perception and satisfaction of care by patients has been found to correlate well with lack of adequate knowledge of treatment process, disease state and medication side effects.[18]

Lack of clear eligibility guidelines may result in improper differentiation of patients into the models as in Malawi where up to one quarter of the patients examined eligible for MMS were not enrolled, and unstable patients were found participating in different models which is potentially deleterious.[19] Poor knowledge and compliance to treatment guideline by the physicians is well documented on a variety of disease conditions ranging from obesity[20] to HIV infection[21]. Further research on this will need to investigate if the patients were properly differentiated across the hospitals in Imo state and if there is a variation in the knowledge level of differentiated care across the hospitals.

DSD approaches allow patients to obtain ARVs refills of three, four, six and even up to twelve months, sometimes without visiting the clinic, thereby mitigating the difficulty experienced in obtaining the refills through the usual care system and help decongest the health facilities. Adopting this method of ART delivery has helped to reduce the frequency of visitation to the hospitals and contacts with the healthcare professionals. However, this can pose a potential threat to the sustainability of the treatment success if patients are not made to understand that they should report to the hospitals for intensified care should they develop any co-morbidity and opportunistic infection despite being enrolled in any of the DSD model. In this study, it was observed that more than one-third of the respondents do not know that any patients on DSD who develop any opportunistic infections should visit the hospital for intensified care. Unfortunately, the result of this study shows that highest percentage of patients who are oblivious of this vital information was found in the multiple months group. Of all the DSD examined in this study, the multiple months model happens to be the group with the least frequency of clinic visit. This trend of events was also reported by.[22]. Educational interventions may be necessary especially for the patients with the least contact with the health facilities. Such interventions should constantly emphasize the need for clinic visit even outside the schedule time in the event of one developing any opportunistic infections or adverse drug reactions. Such interventional strategy holds the potential to whip up wider acceptance of the models among the patients who may be reluctant to enroll into the DSD[23] because of the fear of losing contact with the health provider. Effective tracking system for patients should be integrated into the differentiated care framework because the danger of longer intervals between clinic visits will imply that patients may spend longer with co-morbidities, adverse events, and viraemia thus increasing the risk of resistance.[24]

The knowledge about the fate of patients who are not eligible to be enrolled in any of the differentiated care models was poor, and the implication of this is that it can instigate patients to give false information about their health condition in order to retain their group membership which can mar the chances of success of the program. In DSD, people who are ineligible to join any of

the models are retained in the usual care group until they meet up the criteria for enrolment. One of the conditions that could disqualify one from enrolment is the presence of co morbidities or opportunistic infections. The awareness of this information by the patients needs to be emphasized as a study by Alamo et al has revealed that clinicians were getting worried that patients were not revealing their acute illnesses because they would not want to be transited back into the usual care category which might compromise the quality of care in the longer term.[25]

Level of education and participation in HIV activities were the significant determinants of patients knowledge of DSD. This is consistent with a study in Benin, Nigeria that reported education to be well associated with knowledge of HIV infection.[26] Although high level of education cannot be directly linked to higher knowledge of HIV/AIDS, people with higher educational attainment generally have greater access to information and are more intellectually empowered to comprehend any information.

Limitations

This study is not without limitations. In the first place, there was lack of clear separation of the patients into different DSD models in some hospitals due to improper documentation of patients' profile, health system lapses and poor monitoring. For instance, there was a time that some hospitals temporarily collapsed all the patients into one group when DTG-based regimen was introduced on the ground that such measure was expedient in order monitor the patients closely before continuing with routine system of ART delivery. Also, most patients in this study were from the rural or semi-rural settings; only few of them resided in the city. Hence, it is possible that the knowledge level would had been higher if majority of the respondents were from urban areas. Lastly, this study was a self-reported one, and like many other subjective methods of measurement, is associated with some limitations. This may limit the scope of the generalization of the findings.

CONCLUSION

The findings of this study has demonstrated that patients had fair knowledge of the DSD in all the models examined, as well as the usual group; and this did not differ significantly across the groups. However, it was clear that many of them had little knowledge of the eligibility criteria for enrolment into any model. In order to sustain the program and set it on the pact of steady improvement, there is need for a holistic national guideline on the differentiated care implementation framework that will guide the health workers in scaling up the differentiated care, while periodic education of the patients will enlighten them more about the service delivery program and the necessary actions to take whenever challenges occur. All stakeholders involved in the ART can better the program as they scale it up across the states by addressing the knowledge gap identified in this study.

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