International Journal of Community Medicine and Public Health
Luke A et al. Int J Community Med Public Health. 2022 Oct;9(10):3878-3888
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20222584

Review Article

Self-reported adherence to HIV/AIDS management and associated factors among gender-groups at a referral treatment centre in Port Harcourt, Nigeria

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Received: 26 July 2022
Revised: 05 September 2022
Accepted: 16 September 2022

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ABSTRACT

The self-reported method of assessing adherence levels among human immuno-deficiency virus (HIV)-positive patients is the most commonly applied measure, despite its limitations with recall bias and overestimation of outcome variables. This study determined the levels of self-reported adherence to HIV/AIDS management and its associated factors among gender groups at a referral treatment centre in Port Harcourt, Nigeria. This cross-sectional study was conducted among HIV-positive adults attending the University of Port Harcourt Teaching Hospital between September 2020 to November 2020. Systematic sampling technique was employed to select eligible participants using a 7-item brief medication self-reporting tool. Data was analysed with statistical package for social science (SPSS) version-25. Test of association was measured using Pearson's Chi-square and spearman rho rank tests, set at a significance level of $p<0.05$ and 95% confidence interval. Confounding variables were controlled using multiple logistic regression analysis. 1600 participants; females (800), and males (800) were recruited. The mean age and standard deviation reported were; male (44.53±10.50), female (40.58±9.34). The mean self-reported optimal adherence levels observed were; male (98.7±6.4) and female (97.3±10.0). The significant variables associated with self-reported adherence levels were revealed only among the male group; religion (aOR=0.076; 95% CI=0.024-0.239; $p<0.001$), level of education (aOR=0.451; 95% CI=0.213-0.955; $p=0.038$), and non-payment for HIV support services (aOR=4.105; 95% CI; 1.712-9.792; $p<0.001$). The male group self-reported better optimal adherence than the female group. Also, the associated factors to self-reported adherence were only significant among the male group. Therefore, robust adherence counselling should be targeted at improving adherence among the female gender.

Keywords: Self-reported adherence, HIV/AIDS management, Associated factors, Gender-groups, Referral treatment centre

INTRODUCTION

Gender, a society's shared belief in the socio-cultural, psychological, economic and behavioural traits that distinguish males from females has shown to play a vital role in defining differences in human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) management.[1] These disparities ascertain how gender influences the spread of HIV, access and adherence to HIV/AIDS management. A greater proportion of the

female gender relies on their male counterpart for their livelihood.[2,3] This predisposes the former to the vulnerability of pervasive societal beliefs and traditions seen especially in low socio-economic settings.[2-4] Studies have shown that the female population is disproportionately susceptible to high-risk sexual behaviours, barriers to access and poor adherence to HIV/AIDS management which adversely impact on their health and well-being.[2,4,5] However, these vulnerabilities hugely lie in the social, cultural, and economic factors, and the anatomy of the female reproductive tract associated with the spread of HIV, as well as access and adherence to treatment, care and support among the People Living with HIV/AIDS (PLWHA).[6,7] Also, the inequality that the male gender exhibit over their female counterpart in the spread of HIV, access and adherence to HIV/AIDS management may be due to these factors. Others include poverty, low female empowerment, poor decision-making power, and vulnerability to widespread violence at home, workplaces and even health care facilities.[2-4]

Furthermore, adherence to HIV/AIDS management goes beyond an HIV-positive client consistently and accurately taking the fixed-dose combination of antiretroviral therapy (ART) at approximately the same time, daily.[8-10] It also involves sticking to the nutritional plan, lifestyle modification, family/social support and scheduled appointments for ART refill and viral load monitoring.[9-12] Though, compliance which is the extent to which a patient understands and follows instructions on his treatment plan without necessarily keeping to it, has frequently been mistaken and used interchangeably with adherence.[8,11,13] Non-adherence to ART may occur in the following situations or combinations: late or non-initiation of the prescribed treatment, suboptimal completion of the dosing regimen or early discontinuation of the treatment.[8,14]

Adherence can be measured in the following ways: Self-reporting, pharmacy refill, pill count, medication event monitoring system (MEMSCap) and viral load monitoring.[15-17] According to the World Health Organization (WHO), self-reported adherence can be categorized into two: optimal adherence is the commitment and precise involvement of an informed HIV-infected patient to consistently and accurately take at least 95% of highly active antiretroviral therapy (HAART) approximately at the same time daily as prescribed on the treatment plan, which is considered appropriate to achieve viral load suppression; and suboptimal adherence is when an HIV-positive client takes <95% of the prescribed HAART regimen resulting in viral load non-suppression.[18-20] Self-reported adherence can be measured quantitatively using a complex questionnaire with the following variables; the ART regimen a patient is on, the dose of HAART, dose intervals, route of administration of the drug and the number of days with wrong or missed administration.[16,17,21]

Presently, there is no single gold standard for measuring adherence to HIV/AIDS management as documented in the literature. Employing only one method has shown to result in biased outcomes in the level of adherence and gender differences.[22,23] Even though it is important to assess adherence levels using viral load monitoring in addition to any other method, the self-reported method is the commonest of all adherence measures, as questions are asked based on the patient's ART treatment history in the last 1-4 weeks before the study was conducted. However, the viral load monitoring approach control for recall bias in 90-100% of respondents, even though a longer duration may give more representative results.[17,19,24] This study focused only on self-reported adherence, which is the most commonly applied method of monitoring adherence to ART among PLWHA. Thus, the research assessed the self-reported adherence to HIV/AIDS management and associated factors among gender groups at a referral treatment centre in Port Harcourt, Nigeria.

METHODS

The adult ARV therapy clinic at the University of Port Harcourt Teaching Hospital (UPTH) serves as one of the two major referral centres for PLWHA in Rivers State due to the presence of multi-disciplinary experts. The clinic is run on daily bases except for public holidays and weekends by basically three departments; community medicine, internal medicine and medical microbiology. In the preceeding 3-months of study, an average of 130 and 2640 [792 (30%) males, 1848 (70%) females] HIV-positive adults were attended to daily and monthly respectively. This research was designed as a hospital-based comparative cross-sectional study to assess the self-reported adherence to HIV/AIDS management and associated factors among gender-groups at a referral treatment centre in Port Harcourt, Nigeria.

Data was collected using a 7-item interviewer-administered structured questionnaire adapted from the brief medication questionnaire self-reporting tool. A total 1600 eligible participants (800 in each gender group) were selected by systematic random sampling technique from the ARV clinic register on daily basis between September 2020 and November 2020. Data were entered into Microsoft excel sheet, checked for completeness, coded, cleaned and analyzed on SPSS version-25 software. Categorical variables were displayed as frequencies and proportions, while the continuous variables were summarized as mean and standard deviation. To assess the association between dependent and independent variables, the Pearson's Chi-square and Fishers' exact tests were used to analyze categorical variables, while the spearman rho rank test was used for continuous variables. The statistical significance level was set at $p<0.05$ and a 95% confidence interval. Multiple logistic regression was used to control for confounding variables.

Ethical approval was sought from the research ethics committee in the study area with the approval number: UPTH/ADM/90/S.II/VOL.XI/885. Written informed consent was obtained from each participant before

commencing the study. The aim of the study was explained to all eligible respondents in clear terms with the option to participate or not and to willingly refrain from answering any questions they were not comfortable with. Anonymity and absolute confidentiality were guaranteed with the use of clinic care card numbers.

A total of 1700 questionnaires were administered to subjects who met the inclusion criteria with a 94% response rate, though 100 of them who gave consent, refused to respond to most of the vital questions and were excluded from the analysis. However, only 1600 questionnaires were analyzed consisting of 800 HIV-positive males and 800 HIV-positive females. The mean age of males and females were 44.53±10.50 and 40.58±9.34 respectively (p<0.001). The majority of the respondents were married with a higher proportion in the male group compared to their female counterparts (75.8% versus 58.6%, p<0.001). Also, the male group showed a greater proportion of respondents among those with secondary level of education (64.5%, versus 57.3%, p=0.001); those who lived in urban residence (81.1% versus 62.5%, p<0.001) and participants who were Christians (97.4% versus 96.5%, p=0.171). On the other hand, the female group revealed a higher proportion of respondents among the Igbo ethnic group (38.4% versus 34%, p=0.003), and those whose occupation is business (29.5% versus 27.9%, p<0.001) (Table 1).

The mean self-reported adherence score was observed to be higher among the male group (98.7±6.4) compared to the female group (97.3±10.0), with an observed statistically significant gender difference (p=0.001) (Table 2).

The proportion of respondents who self-reported optimal level of adherence to HIV/AIDS management was observed to be higher among the male group (94.5%) compared to the female group (89.1%), at p<0.001 (Table 3).

At the bivariate level, among categorical variables associated with self-reported adherence to HIV/AIDS management, a greater proportion of the male group compared to their female counterparts self-reported optimal adherence among the following categories: WHO clinical stage-1 (95.1% versus 89.0%, p=0.012), married (94.1% versus 88.8%, p=0.353), those who married between the ages of 30-39 years (95.3% versus 87.3%, p=0.025), those who take ART regularly (94.8% versus 89.1%, p=0.003), received adherence counselling (94.7% versus 89.1%, p=0.027), had no treatment supporters (95.2% versus 89.8%, p=0.024), did not pay for HIV services (95.4% versus 89.9%, p<0.001) (Tables 7-9).

The spearman rho rank test reported that the male gender showed a weak and inverse correlation (negative) between the income of respondents and self-reported adherence. Although, there was a weak but direct correlation (positive) between age group, level of education and self-reported adherence. However, there was no significant association between the dependent and the independent variables across gender groups (Table 6).

To control for confounding variables, the multiple logistic regression analysis was conducted and this revealed that the male group who were Christians (aOR=0.076; 95% CI=0.024-0.239) and had primary/secondary/no formal education (aOR=0.451; 95% CI=0.213-0.955) had less likelihood of optimally adhering to HIV/AIDS management compared to other categories of the same variable. On the contrary, those who did not pay for HIV services (aOR=4.105; 95% CI=1.721-9.792) were more likely to optimally adhere to HIV/AIDS management compared to those who did (Table 10).

Table 1: Socio-demographic characteristics of HIV-positive male and female respondents.

Variables	Males (n=800)	Females (n= 800)	Test statistic (p value)
Age group (years)			
Less than 20	5 (0.6)	1 (0.1)	106.161 (<0.001) *
20-29	65 (8.1)	94 (11.8)	
30-39	194 (24.3)	367 (45.9)	
40 and more	536 (67.0)	338 (42.3)	
Mean age±SD	44.53±10.50	40.58±9.34	
Marital status			
Single	144 (18.0)	160 (20.0)	93.782 (<0.001) *
Cohabiting	6 (0.8)	9 (1.1)	
Married	606 (75.8)	469 (58.6)	
Separated	2 (0.3)	25 (3.1)	
Divorced	3 (0.4)	7 (0.9)	
Widowed	39 (4.9)	130 (16.3)	
Tribe			
Igbo	272 (34.0)	307 (38.4)	17.888 (0.003) *
Hausa	10 (1.3)	0 (0.0)	
Yoruba	23 (2.9)	13 (1.6)	
Ikwerre	150 (18.8)	134 (16.8)	

Continued.

Variables	Males (n=800)	Females (n= 800)	Test statistic (p value)
Kalabari	22 (2.8)	16 (2.0)	
Others	323 (40.4)	330 (41.3)	
Education			
No formal education	4 (0.5)	18 (2.3)	20.660 (0.001) *
Primary	76 (9.5)	96 (12.0)	
Secondary	516 (64.5)	458 (57.3)	
Undergraduate	11 (1.4)	25 (3.1)	
Tertiary	177 (22.1)	189 (23.6)	
Post graduate	16 (2.0)	14 (1.8)	
Occupation			
Trading	71 (8.9)	141 (17.6)	317.133 (<0.001) [b]*
Business	221 (27.9)	236 (29.5)	
Civil/Public servant	133 (16.6)	86 (10.8)	
Engineering	16 (2.0)	0 (0.0)	
Retired	34 (4.3)	19 (2.4)	
Students	33 (4.1)	22 (2.8)	
Artisan	164 (20.5)	82 (10.3)	
Housewife	0 (0.0)	152 (19.0)	
Others	97 (12.1)	8 (1.0)	
Unemployed	31 (3.9)	54 (6.8)	
Residence			
Rural	72 (9.0)	147 (18.4)	68.610 (<0.001) *
Semi-urban	79 (9.9)	153 (19.1)	
Urban	649 (81.1)	500 (62.5)	
Religion			
Christianity	779 (97.4)	772 (96.5)	3.532 (0.171) [b]
Islam	15 (1.9)	25 (3.1)	
African tradition	6 (0.8)	3 (0.4)	

*Significant, [b]Fischer's

Table 2: The mean self-reported adherence score of HIV-positive male and female respondents.

Variable	Males (n=800)	Females (n=800)	Test statistic (p value)
Mean self-reported adherence score	98.7±6.4	97.3±10.0	3.354 (0.001) *

*Significant

Table 3: Self-reported adherence level of HIV-positive male and female respondents.

Variables	Optimal	Sub-optimal	Test statistic (p value)
Males (n=800)	756 (94.5)	44 (5.5)	15.373 (<0.001) *
Females (n=800)	713 (89.1)	87 (10.9)	

*Significant

Table 4: Self-reported reasons for non-adherence to HIV treatment among HIV-positive male and female respondents.

Variables	Males (n=800)	Females (n=800)	Test statistic (p value)
Miss any dose (1 month)			
Yes	45 (5.6)	85 (10.6)	13.386 (<0.001) *
No	755 (94.4)	715 (89.4)	
Doses missed n=130			
One	24 (53.3)	53 (62.4)	3.774 (0.152) [b]
Two	18 (40.0)	21 (24.7)	
Three and more	3 (6.7)	11 (12.9)	
Side effects			
Yes	21 (2.6)	27 (3.4)	0.773 (0.379)
No	779 (97.4)	773 (96.6)	

Continued.

Variables	Males (n=800)	Females (n=800)	Test statistic (p value)
Nature of side effect n=48			
Weakness	2 (9.5)	0 (0.0)	5.2149 (0.267) [b]
Body pain	5 (23.8)	5 (18.5)	
Dizziness	6 (28.6)	8 (29.6)	
Headache	2 (9.5)	0 (0.0)	
Others	9 (42.9)	14 (51.9)	
Self-reported adherence			
Optimal	756 (94.5)	713 (89.1)	15.373 (<0.001) *
Suboptimal	44 (5.5)	87 (10.9)	

*Significant, [b]Fischer's

Table 5: Association between socio-demographic factors and self-reported adherence among HIV-positive male and female respondents.

	Males (n=800)			Females (n=800)		
Variables	**Optimal adherence**	**Suboptimal**	**Test statistic (p value)**	**Optimal**	**Suboptimal**	**Test statistic (p value)**
Age						
30	66 (94.3)	4 (5.7)	0.007 (1.000) [b]	80 (84.2)	15 (15.8)	2.686 (0.113)
>30	690 (94.5)	40 (5.5)		633 (89.8)	72 (10.2)	
Marital status						
Single	137 (95.1)	7 (4.9)	2.573 (0.579) [b]	144 (90.0)	16 (10.0)	3.154 (0.492) [b]
Cohabiting	5 (83.3)	1 (16.7)		7 (77.8)	2 (22.2)	
Married	571 (94.2)	35 (5.8)		421 (89.8)	48 (10.2)	
Separated/divorced	5 (100.0)	0 (0.0)		29 (90.6)	3 (9.4)	
Widowed	38 (97.4)	1 (2.6)		112 (86.2)	18 (13.8)	
Employment status						
Professional	53 (93.0)	4 (7.0)	1.841 (0.614) [b]	80 (83.3)	16 (16.7)	7.100 (0.057) [b]
Skilled manual	158 (92.9)	12 (7.1)		137 (91.9)	12 (8.1)	
Skilled non-manual	507 (94.9)	27 (5.1)		487 (89.7)	56 (10.3)	
Unskilled	38 (97.4)	1 (2.6)		9 (75.0)	3 (25.0)	
Residence						
Rural	68 (94.4)	4(5.6)	5.931 (0.052) [b]	123 (83.7)	24 (16.3)	5.964 (0.050)
Semi-urban	70 (88.6)	9 (11.4)		136 (88.9)	17 (11.1)	
Urban	618 (95.2)	31 (4.8)		454 (90.8)	46 (9.2)	
Religion						
Christian	743 (95.4)	36 (46)	30.848 (<0.001) [b]*	690 (89.4)	82 (10.6)	3.100 (0.189) [b]
Islam	12 (80.0)	3 (20)		21 (84.0)	4 (16.0)	
Others	1 (16.7)	5 (83.3)		2 (66.7)	1 (33.3)	
Education						
No formal education	4 (100.0)	0 (0.0)	8.587 (0.034) [b]*	14 (77.8)	4 (22.2)	2.671(0.438)
Primary	68 (89.5)	8 (10.5)	85 (88.5)		11 (11.5)	
Secondary	496 (96.1)	20 (3.9)	410(89.5)		48 (10.5)	
Tertiary	188 (92.2)	16 (7.8)		204 (89.5)	24 (10.5)	

*Significant, [b]Fischer's

Table 6: Correlation between age group, income level and self-reported adherence among HIV-positive male and female respondents.

Variables	Male (n=800) Self-reported adherence		Female (n=800) Self-reported adherence	
		P-value		**P value**
Age group	0.025	0.478	-0.012	0.732
Income	-0.002	0.947	-0.056	0.116
Education	0.070	0.047 *	-0.014	0.686

Table 7: Association between treatment characteristics and self-reported adherence among HIV-positive male and female respondents.

	Males (n=800)			Females (n=800)		
Variables	**Self-reported optimal adherence**	**Suboptim-al**	**Test statistic (p value)**	**Optimal**	**Suboptimal**	**Test statistic (p value)**
Type of regimen						
First line	545 (94.5)	32 (5.5)	0.008 (0.927)	534 (88.0)	73 (12.0)	3.441 (0.083)
Second line	211 (94.6)	12 (5.4)		179 (92.7)	14 (7.3)	
How many times a day						
Once	586 (94.5)	34 (5.5)	0.001 (0.970)	587 (88.5)	76 (11.5)	1.381 (0.292)
More than once	170 (94.4)	10 (5.6)		126 (92.0)	11 (8.0)	
Duration of ART						
One year	699 (94.6)	40 (5.4)	0.675 (0.730)[b]	618 (89.2)	75 (10.8)	1.524 (0.487)
Two years	33 (91.7)	3 (8.3)		57 (91.9)	5 (8.1)	
Three years and more	24 (96.0)	1 (4.0)		38 (84.4)	7 (15.6)	
Co-morbidity						
Yes	65 (90.3)	7 (9.7)	2.714 (0.099)	68 (93.2)	5 (6.8)	1.343 (0.324)
No	691 (94.9)	37 (5.1)		645 (88.7)	82 (11.3)	
WHO stage						
1	715 (95.1)	37 (4.9)	11.120 (0.012)[b]*	674 (89.0)	83 (11.0)	4.772 (0.080)[b]
2	34 (85.0)	6 (15.0)		36 (94.7)	2 (5.3)	
3	6 (100.0)	0 (0.0)		3 (60.0)	2 (40.0)	
4	1 (50.0)	1 (50.0)				

*Significant, [b]Fischer's

Table 8: Association between socio-cultural factors and self-reported adherence among HIV-positive male and female respondents.

	Males (n=800)			Females (n=800)		
Variables	**Self-reported adherence optimal**	**Suboptim-al**	**Test statistic (p value)**	**Optimal**	**Suboptimal**	**Test statistic (p value)**
Are you married						
Yes	572 (94.1)	36 (5.9)	0.864 (0.353)	486 (88.8)	61 (11.2)	0.137 (0.712)
No	184 (95.8)	8 (4.2)		227 (89.7)	26 (10.3)	
Age at marriage						
≤ 20	9 (90.0)	1 (10.0)	8.771 (0.025) *	96 (89.7)	11 (10.3)	0.636 (0.903)
21-29	161 (94.2)	10 (5.8)		266 (89.0)	33 (11.0)	
30-39	367 (95.3)	18 (4.7)		117 (87.3)	17 (12.7)	
≥40	35 (83.3)	7 (16.7)		7 (100.0)	0 (0.0)	
Partner also positive						
Yes	291 (94.2)	18 (5.8)	0.471 (0.800) [b]	182 (89.2)	22 (10.8)	0.048 (0.976)
No	264 (93.6)	18 (6.4)		266 (88.7)	34 (11.3)	
Don't know	17 (100.0)	0 (0.0)		38 (88.4)	5 (11.6)	
Take medication regularly						
Yes	747 (94.8)	41 (5.2)	8.913 (0.003) [b]*	697 (89.1)	85 (10.9)	0.001 (1.000)
No	9 (75.0)	3 (25.0)		16 (88.9)	29 (11.1)	

*Significant, [b]Fischer's

Table 9: Association between HIV support services and self-reported adherence among HIV-positive male and female respondents.

	Males (n-800)			Females (n=800)		
Variables	**Self-reported adherence optimal**	**Subopti-mal**	**Test statistic (p value)**	**Optimal**	**Subopti-mal**	**Test statistic (p value)**
Have support						
Yes	649 (94.3)	39 (5.7)	0.269 (0.604)	514 (88.5)	67 (11.5)	0.945 (0.331)
No	107 (95.5)	5 (4.5)		199 (90.9)	20 (9.1)	
Counselled						
Yes	749 (94.7)	42 (5.3)	4.897 (0.027) [b]*	692 (89.1)	85 (10.9)	0.116 (0.733) [b]
No	7 (77.8)	2 (22.2)		21 (91.3)	2 (8.7)	
Treatment support						
Yes	98 (89.9)	11 (10.1)	5.119 (0.024) *	156 (86.7)	24 (13.3)	1.448 (0.229)
No	658 (95.2)	33 (4.8)		557 (89.8)	63 (10.2)	
Family members also positive						
Yes	70 (90.9)	7 (9.1)	2.114 (0.146)	116 (90.6)	12 (9.4)	0.354 (0.552)
No	686 (94.9)	37 (5.1)		597 (88.8)	75 (11.2)	
Paid for HIV services						
Yes	64 (85.3)	11 (14.7)	13.380 (<0.001) *	143 (86.1)	23 (13.9)	1.920 (0.166)
No	692 (95.4)	33 (4.6)		570 (89.9)	64 (10.1)	

*Significant, [b]Fischer's

Table 10: Multiple logistics regression analysis of self-reported adherence to treatment among HIV-positive male adults.

Variables	Crude odds	95% C.I.		P value	Ad odds	95% C.I.		P value
Religion								
Christian	0.079	0.031	0.203	<0.001*	0.076	0.024	0.239	<0.001*
Others	Ref							
Education								
No education/pry/ sec	0.535	0.283	1.011	0.054	0.451	0.213	0.955	0.038*
Tertiary	Ref							
Age married								
≥30	0.843	0.413	1.720	0.638	0.562	0.252	1.258	0.161
<30	Ref							
ART medication frequently								
Yes	0.165	0.043	0.631	0.009*	0.201	0.034	1.188	0.077
No	Ref							
Have support								
Yes	1.286	0.496	3.356	0.605	1.004	0.343	2.941	0.994
No	Ref							
Paid for services								
Yes	3.60	1.739	7.470	0.001*	4.105	1.721	9.792	0.001*
No	Ref							

*Significant

DISCUSSION

The present study observed that a higher proportion of male respondents self-reported better optimal adherence levels compared to the female group with a statistically significant gender difference. This may be attributed to the fact that a higher proportion of the male group compared to their female group attended adherence counselling sessions, had treatment supporters and did not pay for HIV/AIDS support services. Moreover, the ARV-therapy clinic in the facility currently reminds clients through short message service (SMS) and phone calls, as well as deliver ART to the homes of clients who are unable to attend scheduled clinic visits to improve adherence to treatment.

This implies that gender may play a vital role in self-reporting optimal adherence to HIV/AIDS management as these findings are consistent with previous studies conducted in Nigeria, Togo, and Brazil.[25-28] Contrarily, other studies carried out in sub-Saharan Africa, Tanzania and Cape town reported that a greater proportion of the female group who self-reported optimal adherence levels than the male group.[29-31] Although, two studies carried out in Nigeria and Cameroun showed no statistically significant gender difference in the self-reported adherence level of respondents.[32,33]

Regarding the socio-demographic variables, respondents who were ≥40 years of age, married, live in urban settings, had secondary education, and were of the Christian religion were more among the male group than the female group; with a statistically significant gender difference between the identified socio-demographic variables and self-reported optimal adherence. On the flip side, the female gender had a higher proportion of participants who were of the Igbo ethnic group and engaged in business as their source of livelihood. This is in agreement with previous studies conducted in Nigeria, South Africa, Tanzania, Canada, and the United States of America which showed statistically significant gender disparities in the socio-demographic characteristics of HIV-positive respondents.[18,34-39] Conversely, a systematic review carried out in sub-Saharan Africa in addition to other cross-sectional studies conducted in the Gambia and South Africa reported higher odds of self-reported optimal adherence among the female respondents compared to their male counterparts.[29,31,40] However, there was no observed statistically significant gender difference between self-reported adherence and socio-demographic variables in studies conducted in Togo, Cameroun, Malawi and the United States of America.[27,33,39,41]

Furthermore, variables such as; level of education, religion and HIV/AIDS support services were statistically significantly associated with self-reporting optimal adherence only among the male group. However, male respondents with a tertiary level of education self-reported higher optimal adherence to HIV/AIDS treatment compared to other categories. This is most likely because male participants with tertiary education understand the importance of adhering to their treatment plan as they disclosed their HIV status and sought healthcare services at the ARV therapy centre as opposed to those with lower levels of education. This implies that the higher the level of education of PLWHA, the better they will self-report optimal adherence to HIV/AIDS treatment. This is in keeping with previous studies conducted in Togo and the United States of America which showed that an increase in the level of education of clients/patients directly improved the proportion of respondents who self-reported optimal adherence.[27,39] In addition, studies conducted in Tanzania, South Africa and Congo which also reported that having a higher level of education was associated with self-reporting optimal adherence, though this was not statistically significant.[35,36,42] On the other hand, studies conducted in Nigeria, Ethiopia, and Lao People's Democratic Republic (PDR) revealed that self-reporting optimal adherence was inversely proportional to increasing level of education; as respondents with higher educational degrees who self-reported optimal adherence were lower in proportion compared to other categories.[43-46]

The religious affiliation of respondents showed that participants who are Christians had less likelihood of self-reporting optimal adherence to HIV/AIDS management compared to the Muslims and other traditional practitioners. This may be because this study was conducted in the south-south region of Nigeria with predominantly Christians. These observations are in line with the findings from previous studies carried out in Calabar, also in the south-south region of Nigeria, which also showed that a higher proportion of respondents were Christians.[25,34] On the contrary, other cross-sectional studies conducted in the southwest region of Nigeria, revealed that self-reported optimal adherence was greater among respondents of the Islamic faith than the Christians.[18,26,47] These disparities are likely due to the unequal proportion of participants recruited from the religious groups in all the Nigerian studies. This implies that though religion was significantly associated with self-reporting optimal adherence to HIV/AIDS management in the present study, the outcome was dependent on the dominant religious group in the study area.

Concerning the treatment characteristics, male respondents who did not pay for HIV support services had an increased probability of self-reporting optimal adherence than those that paid, and this was statistically significant. This finding may be due to the fact that HIV services such as; adherence counselling, refilling of ART, viral load testing, having treatment support, appointment reminders through SMS and phone call within the study area are rendered to HIV-positive patients at no cost. Thus, these services may have improved adherence to HIV/AIDS management at the treatment centre. This finding is in concordance with previous studies conducted in Nigeria, Ethiopia, Malawi, and the United States of America which revealed that a greater proportion of respondents who received HIV support services without payment self-reported higher optimal adherence levels than those who paid for the services.[26,39,41,48,49] Therefore, it is possible that if HIV support services are rendered at no cost, the adherence outcomes among PLWHA will ultimately improve.

Strengths

The use of a protocol for the collection, measurement, and interpretation of findings was adopted to minimize anticipated interviewer bias.

The control of potential biases and confounders was achieved by using a standardized questionnaire and adequate training of interviewers.

The sampling bias was minimized by employing the systematic sampling technique done daily using the clinic register.

The information bias was controlled by maintaining the privacy and confidentiality of all participants and granting them the right to withdraw from the study at any point without jeopardizing their care at the ARV therapy centre.

Confounding was controlled by the use of multiple logistic regression to analyze data at the multivariate level.

Limitations

The study is descriptive in design.

There were anticipated potential biases in the course of the study; sampling, interviewer, and recall biases.

The sensitive nature of disclosing the socio-cultural, economic and psychosocial factors associated with adherence to HIV/AIDS management that clients face may have affected the responses of participants resulting in information bias.

CONCLUSION

Self-reported adherence was higher in the male gender as opposed to the female gender. However, religion, level of education and not paying for HIV support services were significantly associated with self-reporting optimal adherence.

Recommendations

The female gender should be specifically targeted during adherence counselling. More so, HIV support services should take into consideration the social, cultural and economic background of PLWHA in maintain optimal adherence. The HIV response programme should inculcate the use of adherence counsellor to improve optimal adherence.

ACKNOWLEDGEMENTS

Authors would like to appreciate all the esteemed PLWHA who make personal efforts to adhere to their management plan, irrespective of the socio-cultural, psychosocial and economic barriers they encounter.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Luke A, Owhonda G, Tobin-West C. Self-reported adherence to HIV/AIDS management and associated factors among gender-groups at a referral treatment centre in Port Harcourt, Nigeria. Int J Community Med Public Health 2022;9:3878-88.