Original Article

Assessment of Adherence to Antiretroviral Medications and Associated Factors Using MMAS8 Among Clients Attending the Care and Support Clinic in a Tertiary Health Centre in Southwest Nigeria

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ABSTRACT

Adherence to antiretroviral therapy (ART) is one of the most critical factors of viral suppression. A high level of adherence (>95%) is required for antiretroviral therapy to be effective. Inadequate or non-adherence to ARV drugs is a recurrent index in treating clients receiving antiretroviral medications and is widespread among clients with chronic illness. This study aims to determine the medication adherence rate and assess the factors associated with medication adherence among clients attending the antiretroviral clinic of a tertiary hospital. This descriptive cross-sectional study was conducted at the ART clinic of a tertiary health facility. Data was collected from 258 People Living with HIV (PLWHIV) aged 18 years and above through a simple random sampling technique using an interviewer administered questionnaire. Analysis was done using IBM SPSS version 23. The mean score of adherence to ART using the Morisky Medication Adherence Scale-8 (MMAS8) was 7.2 ±1.2 SD. Most of the respondents 186 (72.1%) did not experience forgetfulness related to taking their medication, and nearly all 242 (93.8%) of the 258 respondents did not miss their drugs the previous week. Sex ($\chi 2 = 8.16$, $p=0.02$) and viral load ($\chi 2 = 27.14$, $p<0.001$) of the respondents were the only factors found to be statistically significantly associated with medication adherence. This study showed MMAS8 to be a more sensitive measure of medication adherence compared to the seven-day recall. The study also establishes a strong association between medication adherence and viral suppression among PLWHIV.

Keywords: Adherence, Antiretroviral, Assessment, Associated Factors, Care and Support Clinic, Clients, Medications, Tertiary Centre

INTRODUCTION

Adherence to antiretroviral therapy (ART) is one of the most critical factors of viral suppression and is the key to staying healthy[1] Adherence to treatment includes starting Human Immunodeficiency Virus (HIV) treatment, keeping all medical appointments, and taking antiretroviral drugs daily and as prescribed by the health care provider. Inadequate or non-adherence includes missed or late doses, treatment interruptions and discontinuations, and inadequate or partial dosing[1,2] Inadequate adherence results in suboptimal plasma drug concentrations, which can develop drug resistance and possible cross-resistance to antiretroviral drugs, resulting in increased morbidity and mortality. Several factors, such as pharmacokinetics, the potency of the regimen, drug interactions, viral fitness, and the genetic barrier to antiretroviral (ARV) resistance, affect the adherence–resistance relationship.[3-5] Furthermore,

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inadequate or suboptimal adherence can limit the options for future effective ARV drug regimens in patients who develop multidrug-resistant HIV; it also can increase the risk of secondary transmission of multi-drug-resistant viruses.[5]

A high level of adherence (>95%) is required for antiretroviral therapy to be effective.[6] However, inadequate or non-adherence to ARV drugs is a recurrent index in treating clients receiving antiretroviral medications; it is also said to be widespread among clients with chronic illness. Several factors have been attributed to these, including inconvenient dosing frequency, dietary restrictions, drug toxicities, formulation of the drugs and side effects. Some other factors include environmental, such as substance and alcohol abuse; psychosocial, such as marital status, loneliness, and work environment; behavioural, such as physical and sexual activities; and sociodemographic characteristics of clients, such as age and income, factors associated with the health care provider.[7-9] Adherence is a complex health behavior influenced by drug regimen, client factors, family factors, and the client-provider relationship.[10]

Varying adherence rates have been reported in studies within and outside the country, ranging from 26.67% to 87.4 %.[11-16] Factors associated with good compliance, as documented in these studies, include female sex, families consisting of only parents and children, no habit of taking alcohol, HIV duration of more than three years, participation in groups of people living with HIV/AIDS, urban residence, absence of co-morbidity, disclosure and knowledge about HIV and HAART while factors associated with poor compliance includes busy schedule, forgot medication, depression, travelled out of town, improved health, religious constraints, use of herbal drugs, side effects of the drugs, non-disclosure and widowhood.[11-16]

The lack of any previous study on adherence in the hospital and the need to monitor levels of adherence in clients attending the care and support clinic necessitated this study. This study aims to determine the medication adherence rate and assess the factors associated with medication adherence among clients attending the antiretroviral clinic of a tertiary hospital.

MATERIALS AND METHODS

A descriptive cross-sectional study was conducted at the ART clinic of the Federal Medical Centre Abeokuta (FMCA), Ogun state. The study population were PLHIV aged 18 years and above receiving care at the facility. Clients on treatment for at least six months were included in the study, while those critically ill were excluded. Ethical approval with number FMCA/470/HREC/01/2022/02 was obtained from the institutional research ethics committee. The sample size was determined using Fischer's formula for sample size determination for a cross-sectional study.[17] Based on the assumptions of the formula and the prevalence of 70.8% for high adherence among PLHIV in a previous study in Ilorin, Nigeria,[13] the minimum sample size for this study was 283. Adjustment was made for a finite population, and 5% non-response was made, bringing the sample size to 258.[18] A simple random sampling technique (balloting) was used to select study participants. Based on clinic attendance in the past six months, an average of 15 clients attended the antiretroviral therapy (ART) clinic daily. A third of the clients who attended the clinic each day were recruited using balloting; this process was repeated till all questionnaires were administered.

Data were collected between March and July 2022 using an interviewer-administered questionnaire designed on the Open Data Kit (ODK), and the research assistants were trained on using the instrument. The Morisky Medication Adherence Scale-8 questionnaire was used to assess respondents' adherence to ARVs.[19] Respondents with an aggregate score of '8' were categorised as high adherence, those with a score of 6 - <8 were categorised as moderate adherence, and those with a <6 were categorised as low adherence.[20]

Data analysis was done using IBM SPSS version 23, with the results presented in prose and tables. The chi-square test was used to assess associations between sociodemographic characteristics and medication adherence, and multinomial logistics regression was used to determine high adherence predictors.

RESULTS

The mean score of adherence to ART using the Morisky Medication Adherence Scale-8 was 7.2 ±1.2 SD. Most of the respondents, 186 (72.1%), did not experience forgetfulness related to taking their medication, and nearly all 242 (93.8%) of the 258 respondents did not miss their drugs the previous week. Also, most of the respondents had positive behaviour as it relates to cutting down on medication use because they felt worse 250 (96.9%), and taking all medications as prescribed the previous day 247 (95.7%) (Table 1)

Table 1: Assessment of adherence to ART using Morisky Medication Adherence Scale-8

MMAS8 (n=258)	Positive behaviour	
	Frequency	Percentage
Do you sometimes forget to take your medications? (no)	186	72.1
People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past one week, were there any days when you did not take your medicine? (no)	242	93.8
Have you ever cut back or stopped your medicine without telling your doctor because you felt worse when you took it? (no)	250	96.9
When you travel or leave home, do you sometimes forget to bring along your medicine? (no)	220	85.3
Did you take all your medicine yesterday? (yes)	247	95.7
Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled/bothered about sticking to your plan? (no)	225	87.2
When you feel like your symptoms are under control, do you sometimes stop taking your medicine? (no)	249	96.5
How often do you have difficulty remembering to take all your medicine?		
Never	179	69.4
once a while	57	22.1
Sometimes	20	7.8
Usually	1	0.4
all the time	1	0.4
Mean score for adherence to ART	7.2 ± 1.2 SD	

Sex ($\chi 2 = 8.16$, $p=0.02$) and viral load ($\chi 2 = 27.14$, $p<0.001$) of the respondents were the only factors found to be statistically significantly associated with medication adherence. Among respondents with high and low medication adherence, males had the higher proportions, with 59.7% and 27.4%, respectively, while a higher proportion of those with moderate adherence were females (29.1%). The highest proportion of respondents with low medication adherence was among those with viral load ≥1000 copies//ml (59.1%), while the highest proportion of respondents with high medication adherence was found among those with viral load between 20 – 999 copies/ml (59.8%), followed by those with viral load <20 copies//ml (54.8%) (Table 2)

Male gender and viral load (<20 and 20 – 999 copies/ml) were the predictors of having moderate medication adherence, although the model fits poorly (0.0%). Male respondents had 4 times higher odds of having moderate medication adherence, while respondents with viral load <20 were 9 times more likely to have moderate medication adherence than those with viral load ≥1000 copies/ml. Viral load (<20 and 20 – 999 copies/ml) was the only predictor for high medication adherence, and this model fits well in 96.5% of the time. Respondents with viral load <20 copies/ml were 12 times more likely to have high medication adherence compared to those with viral load ≥1000 copies/ml (Table 3).

About one-fifth, 49 (19.0%) of the respondents had low medication adherence, while the majority, 144 (55.8%), had high adherence. (Fig. 1)

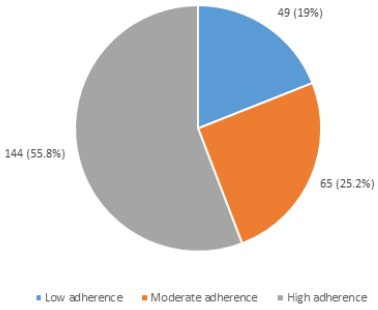

Fig. 1 Level of Adherence to ART among the respondents

Table 2: Association between respondents' sociodemographic/ clinical characteristics and medication adherence

Variables (n=258)	Low adherence	Moderate adherence	High adherence
Age group	n (%)	n (%)	n (%)
≤25	1 (12.5)	3 (37.5)	4 (50.0)
26-35	10 (22.7)	10 (22.7)	24 (54.5)
36-45	24 (23.8)	24 (23.8)	53 (52.5)
46-55	12 (18.5)	18 (27.7)	35 (53.8)
≥56	2 (5.0)	10 (25.0)	28 (70.0)
Test statistic, P - value, $\chi2 = 8.43$, $p = 0.39$			
Sex			
Male	17 (27.4)	8 (12.9)	37 (59.7)
Female	32 (16.3)	57 (29.1)	107 (54.6)
Test statistic, p-value , $\chi2 = 8.16$, +p = 0.02			
Religion			
Islam	15 (18.1)	22 (26.5)	46 (55.4)
Christianity	34 (19.4)	43 (24.6)	98 (56.0)
Test statistic, p-value $\chi2 = 0.14$, $p = 0.93$			
Marital status			
Single	4 (14.8)	8 (29.6)	15 (55.6)
Married	37 (21.3)	43 (24.7)	94 (54.0)
Separated	3 (21.4	4 (28.6)	7 (50.0)
Divorced	1 (20.0)	1 (20.0)	3 (60.0)
Widowed	4 (10.5)	9 (23.7)	25 (65.8)
Test statistic, p-value *$\chi2 = 3.80$, $p = 0.89$			
Educational status			
None	1 (11.1)	4 (44.4)	4 (44.4)
Primary	8 (17.4)	16 (34.8)	22 (47.8)
Secondary	16 (13.9)	27 (23.5)	72 (62.6)
Tertiary	24 (27.3)	18 (20.5)	46 (52.3)
Test statistic, p-value, $\chi2 = 10.90$, $p = 0.09$			
ART regimen			
First line	47(20.6)	56 (24.6)	125(54.8)
Second line	2(6.7)	9 (30.0)	19 (63.3)
Test statistic, p-value $\chi2 = 3.37$, $p = 0.19$			
Monthly income			
<100k	41(18.6)	59 (26.8)	120 (54.5)
≥100k	8(21.1)	6 (15.8)	24 (63.2)
Test statistic, p-value $\chi2 = 2.10$, $p = 0.35$			
Most recent viral load copies//ml			
<20	5 (11.9)	14 (33.3)	23 (54.8)
20 – 999	31(16.0)	47(24.2)	116 (59.8)
≥1000	13(59.1)	4 (18.2)	5 (22.7)
Test statistic, p-value $\chi2 = 27.14$, +p < 0.001			
Duration on treatment			
<2 years	10 (32.3)	5 (16.1)	16 (51.6)
2 – 5 years	18 (21.2)	20 (23.5)	47 (55.3)
> 5 years	21(14.8)	40(28.2)	81 (57.0)
Test statistic, p-value $\chi2 = 6.15$, $p = 0.19$			

Pearson's chi-square test, + Statistically significant

Table 3: Assessment of Determinant predictors of medication adherence among the study subjects

	Variables	aOR	95% Confidence Interval		p-value
			Lower	Upper	
Moderate medication adherence *0.0%	Sex				
	Male	3.734	1.41	9.81	0.008
	Female (RC)	1			
	Viral load copies/ml				
	<20	9.195	1.963	43.08	0.005
	20 – 999	4.661	1.36	15.98	0.014
	≥1000 (RC)	1			
High medication adherence *96.5%	Sex				
	Male	1.477	0.704	3.10	0.302
	Female (RC)	1			
	Viral load copies/ml				
	<20	12.01	2.91	49.57	0.001
	20 – 999	9.53	3.12	28.87	<0.001
	≥1000 (RC)	1			

RC- reference category, aOR- adjusted odds ratio, *model fitting

DISCUSSION

The study assessed medication adherence and associated factors among clients attending the ART clinic in a tertiary health centre in Ogun state. A significant proportion of the respondents in this study had high/moderate medication adherence using the MMAS8 decision criteria; however, two in ten had low medication adherence. Medication adherence is essential for viral suppression and is vital to preventing drug-resistant mutations, thereby preventing resistance. Also, viral suppression is crucial to ending the HIV epidemic, as a virally suppressed client is less likely to transmit the virus to others. Therefore, the fact that a significant proportion of respondents in this study had poor medication adherence calls for concern and needs to be addressed. Compared with previous studies, the proportion of respondents with high/moderate adherence in this study is comparable to the 75.3% reported in a previous study in Ado Southwest Nigeria [21] but higher than the 49.3%, 53.1% and 65% reported in similar studies in Ethiopia, Ghana and Japan respectively.[22-24] Studies have evaluated medication adherence using methods other than MMAS8. One commonly used method is the seven-day recall, which is one of the items that make up the MMAS8 scale. Using this approach, nearly all the respondents (93.8%) had good medication adherence; however, this is at variance with the proportion reported using the MMAS8 approach and reflects the fact that the MMAS8 measures behaviour over a longer period beyond seven days used in the recall approach, hence should be a more sensitive approach to determining adherent clients. The proportion of clients with good medication adherence in this study is comparable to the 95.9% reported in the Ethiopian study[12] but lower than the 50.4% reported in a study in Southsouth Nigeria.[12]

Furthermore, another item in the MMAS8 measures forgetfulness, and about 3 in 10 respondents in our study reported sometimes forgetting to take their medications; this is lower compared to the 43.8% reported by Oku et al.[12] Forgetfulness is a major reason why patients do not adhere to medications, and this has been attributed to denial. Similar findings have been reported in many studies, including those among clients with non-HIV-related chronic illness [25-28]

Although the moderate medication adherence model fits poorly, male sex and suppressed viral load were predictors of moderate adherence; this compares with findings in a study in Ilorin.[13] Our results also show a constant and increasing odds ratio of viral load for clients with high medication adherence. The lower the viral load, the higher the odds of having high medication adherence, with the highest odds reached at a viral load of less than 20 copies/ml. Other studies have also shown a strong association between viral suppression and medication adherence.[29-31]. This finding further underscores the importance of medication adherence in achieving viral suppression and why healthcare providers must encourage and support clients on medication adherence.

CONCLUSION/RECOMMENDATION

The prevalence of medication adherence in this study is relatively high compared to previous reports, and the study showed MMAS8 to be a more sensitive measure of medication adherence compared to the seven-day recall. Also, the study establishes a strong association between medication adherence and viral suppression among PLWHIV. This underscores why healthcare providers, families and communities must encourage and support all PLWHIV in achieving good medication adherence.

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