

SELF-REPORTED ADHERENCE TO TREATMENT: A STUDY OF SOCIOECONOMIC FACTORS AND PSYCHIATRIC MORBIDITY AMONG MALE AND FEMALE PATIENTS WITH HIV INFECTION IN SOKOTO, NIGERIA.

Running Title: Treatment Adherence, Socioeconomic Factors and Psychiatric Morbidity In HIV Patients

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ABSTRACT

Objective: Adherence to treatment is important and relevant in HIV treatment. Previous studies in sub Sahara Africa and south western Nigeria reported that psychiatric morbidity influence treatment adherence.

The present study was to examine treatment adherence among the male and the female patients with HIV infection and the effect of socioeconomic factors and psychiatric morbidity on treatment adherence.

Methods: A total of 159 patients which comprised of 48 male and 111 female who were eligible for this cross sectional prospective study were included having given their consent to participate. Questionnaire relating to socioeconomic factors and treatment adherence were administered. Psychiatric morbidity was assessed using HADS. Data was analyzed with SPSS for windows version 16.0.

Results: Treatment adherence was poor in 5.3% of the patients. The male patients had slightly better adherence than the female patients. Factors associated with poor treatment adherence include poor clinic attendance, presence of anxiety symptoms in males and poor education attainment in females.

Conclusion: Treatment adherence is related to socioeconomic factors and psychiatric morbidity. Treatment protocol in which mental health and detailed socioeconomic circumstance of patient is an integral part should be encouraged.

Keywords: Adherence, HIV, infection, Patient, Treatment



INTRODUCTION

Treatment adherence is a single modifiable factor in HIV infection which influenced disease progression and outcome. For instance, Stephenson reported that 81% of patients with more than 95% adherence demonstrated viral suppression while only about 6% of patients with less than 70% adherence showed improvement in viral markers. In addition short term non adherence (as short as 1 week) may result in rapid rebound of plasma viremia, leading to treatment failure¹. However, in sub – Sahara Africa adherence to HIV

treatment was reported to be very good in spite of endemic poverty². The few who were non adherent posed danger to the community through development of drug resistance.

Previous studies have shown that treatment adherence is affected by a number of factors such as gender, socioeconomic status, and psychiatric morbidity. Tapp et al³ reported that female gender was independently associated with a lower likelihood of being 95% adherent to antiretroviral treatment. In addition, female gender were less likely to start HAART treatment⁴, twice less likely to receive antiretroviral treatment⁵ and less likely to adhere to treatment⁶.

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Morris et al⁷ reported that individuals who earned annual income <\$10,000 and were not employed were at greater risk for treatment discontinuation. Also among 496 adults on antiretroviral treatment in rural Zambia, poor treatment adherence was associated with being divorced, poverty, food insecurity and being less educated⁸. Norman et al⁹ reported that co morbid psychiatric morbidity if untreated result in poor treatment adherence. In KwaZulu-Natal, depression was associated with poorer HAART (Highly active antiretroviral treatment) adherence¹⁰ while adherence improved where a patient with depression were treated with antidepressant¹¹.

In a study among Yoruba dominated region of south western Nigeria, low medication adherence correlated with presence of psychopathology¹². However, sociocultural differences among the Nigerian population would make it difficult to generalize their findings. Hence the need for this study in Hausa dominated north western society.

The present study was to examine the treatment adherence among patients with HIV infection and to examine to what extent socioeconomic factors and psychiatric morbidity influence it in a north western state of the country.

METHODS

Study design and location

This is part of data of hospital based HIV study in Sokoto, Nigeria. Detailed report on methodology has been described in a previous study¹³. In this center, after HIV infection was confirmed using ELISA and western blot, irrespective of CD4 count HAART would be commenced. In order to ensure treatment adherence, a confidant, treatment partner were contacted. This partner could be spouse, father, child, or friend whose duties was to encourage and ensure treatment adherence. This was achieved by direct supervision or by telephone contacts between the patients and the treatment partner.

Questionnaire was designed to assess for sociodemographic variables and income among the patients. Socioeconomic status was assessed using education attainment, employment status, monthly income and change in income since diagnosis. Also

patients were asked their monthly income and poverty was defined by monthly income less than ₦9,000.00 or less than ₦300.00 per day (i.e. Income less than \$2.00 per day).

Clinic attendance and treatment adherence were assessed by asking the patients to rate their clinic attendance as follows: "how would you describe your clinic attendance" and "how would you describe your treatment adherence". Possible responses to the former included: regular, occasionally missed my appointment, often missed my appointment and only come to clinic rarely while for the latter included: I take my drugs religiously, I do occasionally missed my drugs, I do often missed my drugs and I take my drugs poorly.

Subjects who reported that they had regular clinic attendance were considered as having good clinic attendance while subjects who reported their clinic attendance as "occasionally missed appointment", "often missed appointment" and "only come to clinic rarely" were all considered as having poor clinic attendance. With respect to treatment adherence, subjects who reported that "they take their drugs religiously" were considered as having good adherence. However, subjects with treatment adherence such as "occasionally missed drugs", "often missed drugs" or "poorly take drugs" were all considered as having poor treatment adherence. The concept 'religiously' was introduced to denote 'regular and routine'. According to Cambridge dictionary online, 'to do things religiously' suggest 'to do things regularly'. This concept 'religiously' was also used to describe good treatment adherence in previous report¹⁴ which suggest taking treatment on time and everyday¹⁵. This concept is relevant and important in the assessment of issues relating to routine and regularity in African setting because of the strong attachment of African to religion.

For the assessment of psychiatric morbidity, Hospital Anxiety and Depression Scale (HADS) was used¹⁶. This instrument has been previously validated¹⁷ and used^{13, 16-17} in previous studies in Nigeria. Using Likert scoring scale, score range is 0-21 for each of the condition. While patients with score of 0-7 were considered as non cases, those that scored 8-10 and 11 and above were considered as borderline and definite cases for anxiety or depression.

DATA ANALYSIS

Statistical analysis was done using SPSS for windows version 16.0 (SPSS, Chicago, Il). Continuous values were stated as means \pm standard deviation while categorical data were expressed as percentages. Fisher's exact test was used to test for significance for categorical variable. Although Pearson Chi square test is best used when sample size is greater than 1000, where Fishers exact test was unavailable, it was used. Means value of 2 groups were determined using independent t-test. For testing for significant, P-value less than 0.05 was considered statistically significant.

RESULT

A total of one hundred and sixty seven (167) consecutive adult patients who attended VCT (Voluntary Counseling and Testing) clinic in the month of May 2010 were recruited for the study. Of these patients, 8(4.8%) did not fill HADS successfully to be included into the analysis giving response rate of 95.2%. The mean age was 34.52 (\pm 8.93) and were mainly Hausa by tribe (49.7%). One hundred and fourteen (71.7%) were married, 25 (15.7%) were widowed, 8 (5%) were divorced and 11 (8.9%) were never married. Ninety seven (61%) were Muslims and 60 (37.7%) were Christians. In addition, seventy five (47.2%) were employed while about half of the total patients received less than ₦9000.00 per month. Duration of disease ranged from 2 weeks to 10 years while the mean duration of illness was slightly less than 3 years (2.97 \pm 2.58years). (Table 1).

Table 2 showed that the female were more of younger age group than the male with more than one third of them being less than 30 years when compared with the male patients. In addition, there was significant between the age of the male and the female (P = 0.00). Both gender also differed significantly with regard income (P = 0.02), employment status (P=0.00) and education attainment (P=0.00). Even though there was no significant in treatment adherence (p = 0.68), the male marginally had better treatment adherence than the female counterpart. However they did not differ significantly across duration of illness since diagnosis (P = 0.44), change in income (P=0.48), score on HADS for anxiety (P= 0.14) and depression (P = 0.84) (Table 2, 3& 4).

Table 5 showed that more subjects who were widowed, 8.3% or not previously married 9.1% would report poor treatment adherence compared with subjects who were married, 4.5%. In addition no formal education 9.5%, being unemployed (8.7%), income less than ₦9000.00 (5.1%) and poor clinic attendance (22.2%) were all associated with poor treatment adherence. More subjects who were positive for psychiatric morbidity had poor treatment adherence when compared with subjects who had no psychiatric morbidity. For example, subjects who were positive for psychiatric morbidity including borderline anxiety 10% and definite anxiety, 7.1% were associated with poor treatment adherence when compared to subjects who were normal for anxiety. Similarly, poor adherence was associated with higher prevalence of borderline depression (14.3%) compared with the normal (4.8%).

Table 6 showed that being a widower among the male and never married among female have higher prevalence of poor treatment adherence. Poor adherence was also found to be more prevalent among subjects with no formal education in both the male and female. Unemployment was associated with higher prevalence of poor adherence among the male (12.5%) and the females (8.2%) when compared with others who were gainfully employed. Even though there was no significant in both males ($\chi^2 = 0.30$, p = 1.00) and the females ($\chi^2 = 0.03$, p = 1.00), males who reported monthly income less than ₦9000.00 were more (9.1%) likely to report poor treatment adherence compared to the males who earned higher (4.3%). Poor adherence was significantly related to clinic attendance among males ($\chi^2 = 10.23$, p = 0.001) while among the females, though not significantly associated the females who reported poor clinic attendance were 4 times more likely to report poor treatment adherence.

Subjects who were anxious among males, 33.3% (borderline) versus 2.5% who were normal and females, 9.1% definite anxiety versus 5.7% who were normal were likely to report poor treatment adherence. In addition, males who were found to have borderline depression, 16.7% versus 2.6% who were normal for depression and 12.5% female with borderline depression versus 5.8% who were normal for depression reported poor treatment adherence.

Table 1. Distribution of patients characteristics

Characteristics	No. (%)
Gender	
Male	48 (30.2)
Female	111 (69.8)
Age class	
<20	2 (1.3)
20-29	47 (29.9)
30-39	66 (41.5)
40-49	33 (20.8)
>50	9 (5.7)
Marital status	
Never married	11 (6.9)
Married	114 (71.7)
Divorced	8 (5.0)
Widowed	25 (15.7)
Separated	1 (0.6)
Education	
No formal education	44 (27.8)
Primary	19 (12.0)
Secondary	47 (29.7)
Tertiary	48 (30.1)
Religion	
Islam	97 (61.8)
Christianity	60 (37.7)
Are you employed	
Yes	75 (49.0)
No	73 (47.7)
Income per month	
= ? 9000	47 (52.82)
< ? 9000	42 (47.2)
Clinic attendance	
Good	146 (91.8)
Poor	12 (7.6)
Treatment adherence	
Good	144 (94.7)
Poor	8 (5.3)
Psychiatric morbidity	
Anxiety	
No anxiety	134 (84.3)
Borderline	10 (6.3)
Definite anxiety	14 (8.8)
Depression	
Normal	130 (82.3)
Borderline	15 (9.5)
Definite	12 (7.6)

Table 2. Gender and subjects' characteristics

	Male	Female	²	P -value
Age class				
<20	1 (2.1)	1 (0.9)	24.89	<0.00001
20-29	6 (12.8)	41 (37.3)		
30-39	15 (31.39)	51 (46.4)		
40-49	19 (40.4)	14 (12.7)		
50-59	5 (10.6)	3 (2.7)		
Marital status				
Never married	3 (6.2)	8 (7.2)	12.84	0.012
Married	43 (89.6)	71 (64)		
Divorced	0 (-)	8 (7.2)		
Widowed	2 (4.2)	23 (20.7)		
Separated	0 (-)	1 (0.9)		
Education				
No formal education	9 (18.8)	35 (31.8)	20.37	0.00
Primary	6 (12.5)	13 (11.7)		
Secondary	10 (20.8)	37 (33.6)		
Tertiary	23 (47.9)	25 (22.5)		
Religion				
Islam	30 (62.5)	67 (61.5)	0.015	1.000
Christianity	18 (37.5)	42 (38.5)		
Are you employed				
Yes	36 (80)	39 (36.1)	24.67	0.00
No	8 (17.8)	65 (60.2)		
Income per month				
= ? 9000	25 (69.4)	22 (41.5)		0.017
< ? 9000	11 (30.6)	31 (58.5)		
Change in income since diagnosis				
Increase	2 (5.1)	1 (1.3)	2.45	0.48
Decrease	8 (20.5)	12 (15.8)		
No	29 (74.4)	62 (81.6)		
Treatment adherence				
Good	44 (95.7)	99 (93.4)	1.50	0.68
Poor	2 (4.3)	7 (6.6)		
Psychiatric morbidity				
Anxiety				
No anxiety	42 (87.5)	92 (82.9)	1.03	0.80
Borderline	3 (6.2)	7 (6.3)		
Definite anxiety	3 (6.2)	11 (9.9)		
Depression				
Normal	40 (83.3)	90 (81.8)	2.17	0.54
Borderline	6 (12.5)	9 (8.2)		
Definite	2 (4.2)	10 (9.1)		

Table 3: A comparative study of gender and subjects characteristics

	Gender	N	Mean	Std. Deviation	Std. Error mean
Age	Male	47	40.57	9.67	1.41
	Female	110	31.93	7.22	0.69
Monthly income	Male	36	28.890	35.524	5920.76
	Female	53	13.458	20.643	2835.64
Duration in weeks	Male	44	155.27	123.03	18.55
	Female	73	135.97	133.30	15.60
Anxiety score	Male	48	2.90	4.06	0.59
	Female	111	3.92	4.00	0.38
Depression score	Male	48	4.38	3.87	0.56
	Female	111	4.24	3.81	0.36

Table 4: Test for significant by gender

	T-test	Sig. (2-tailed)	Mean	Std. Error	95% confidence interval	
					Lower	Upper
Age	6.19	0.000	8.65	1.40	5.89	11.41
Monthly income	2.35	0.023	15431.40	6564.77	2252.62	28610.17
Duration(weeks)	0.78	0.437	19.30	24.73	-29.68	68.28
Anxiety (score)	-1.47	0.143	-1.02	0.69	-2.39	0.35
Depression(score)	0.20	0.843	0.13	0.66	-1.18	1.44

Table 5. treatment adherence and patients characteristics

	Treatment adherence (%)		²	P - value
	Good	Poor		
Marital status				
Never married	10 (10.9)	1 (9.1)	1.28	0.73
Married	105 (95.5)	5 (4.5)		
Divorced	7 (100)	0 (-)		
Widowed	22 (91.7)	2 (8.3)		
Education attainment				
No formal education	38 (90.5)	4 (9.5)	5.93	0.20
Primary	17 (100)	0 (-)		
Secondary	45 (100)	0 (-)		
Tertiary	32 (91.4)	3 (8.6)		
Postgraduate	11 (91.7)	1 (8.3)		
Are you employed				
Yes	71 (97.3)	2 (2.7)	2.67	0.26
No	63 (91.3)	6 (8.7)		
Income				
Income less than ? 9000.00	37 (94.9)	2 (5.1)	0.02	1.00
Income greater than ? 9000.00	43 (95.6)	2 (4.4)		
Attendance at the clinic				
Good	136 (96.5)	5 (3.5)	6.63	0.01
Poor	7 (77.8)	2 (22.2)		
Psychiatric morbidity (anxiety)				
Normal	121 (95.3)	6 (4.7)	0.68	0.88
Borderline	9 (90.0)	1 (10.0)		
Definite anxiety	13 (92.9)	1 (7.1)		
Psychiatric morbidity (depression)				
Normal	118 (95.2)	6 (4.8)	3.03	0.39
Borderline	12 (85.7)	2 (14.3)		
Definite depression	12 (100)	0 (0.0)		

Table 6: Gender, patients characteristics and treatment adherence

	Treatment adherence (male)		P-value		Treatment adherence (female)		P-value	
	Good	Poor			Good	Poor		
Marital status								
Never married	3 (100.0)	0 (-)	10.52	0.005	7 (87.5)	1 (12.5)	1.17	0.76
Married	40 (97.6)	1 (2.4)			65 (94.2)	4 (5.8)		
Divorced	0 (-)	0 (-)			7 (100)	0 (-)		
Widowed	1 (50.0)	1 (50)			21 (95.5)	1 (4.5)		
Education attainment								
No formal education	8 (88.9)	1 (11.1)	2.98	0.56	30 (90.9)	3 (9.1)	5.96	0.20
Primary	5 (100)	0 (-)			12 (100)	0 (-)		
Secondary	10 (100)	0 (-)			35 (100)	0 (-)		
Tertiary	12 (100)	0 (-)			20 (87.0)	3 (13.0)		
Postgraduate	9 (90)	1 (10.0)			2 (100)	0 (-)		
Are you employed								
Yes	34 (97.1)	1 (2.9)	1.36	0.34	37 (97.4)	1 (2.6)	1.58	0.45
No	7 (87.5)	1 (12.5)			56 (91.8)	5 (8.2)		
Income								
Income less than ? 9000.00	10 (90.9)	1 (9.1)	0.30	1.00	27 (96.4)	1 (3.6)	0.03	1.00
Income greater than ? 9000.00	22 (95.7)	1 (4.3)			21 (95.5)	1 (4.5)		
Attendance at the clinic								
Good	42 (97.7)	1 (2.3)	10.23	0.001	94 (95.9)	4 (4.1)	1.5	0.22
Poor	1 (50)	1 (50)			6 (85.7)	1 (14.3)		
Psychiatric morbidity (anxiety)								
Normal	39 (97.5)	1 (2.5)	6.52	0.04	82 (94.3)	5 (5.7)	0.72	0.87
Borderline	2 (66.7)	1 (33.3)			7 (100)	0 (-)		
Definite anxiety	3 (100)	0 (-)			10 (90.9)	1 (9.1)		
Psychiatric morbidity (depression)								
Normal	37 (97.4)	1 (2.6)	2.55	0.28	81 (94.2)	5 (5.8)	1.35	0.72
Borderline	5 (83.3)	1 (16.7)			7 (87.5)	1 (12.5)		
Definite depression	2 (100)	0 (-)			10 (100)	0 (-)		

DISCUSSION

The present study was to examine treatment adherence among patients who were managed for HIV infection in a teaching hospital in Sokoto, Nigeria. In addition, to determine whether socioeconomic factors and psychiatric morbidity affected treatment adherence among the male and the female patients.

The male and the female patients differed in sociodemographic characteristics such as age, marital status, education attainment and monthly earnings. For instance, the female subjects were younger and more likely to be widowed compared to the male. This may have implication on disease transmission as remarriage of young widow is frequently done without recourse to screening for HIV infection. Also more females were likely to receive no education, remained unemployed and earned income less than ?300.00 per day. However more males reported that their income had decreased since the onset of the illness

compared to the female. These findings suggested that the subjects in this study were likely to be poorer than before the illness. Berbeck et al⁸ reported that poverty contributed to mortality among patients with HIV infection in rural Zambia. Hence, in addition to free drug provided by the hospital, other services such as free meal and transportation could be additional incentive as obtained in Tanzania¹⁸. With regard to socioeconomic factors, marital status was included. This would contrast the use of only income, education and employment by Falagas et al¹⁹ in the assessment of socioeconomic state in their review. In Africa and particularly Nigeria, marital status affects socioeconomic capacity of the subjects as individuals who were married may receive more financial supports than when they were unmarried. In addition, social class may change on account of marriage.

The findings in this study suggested that majority of the patients had good adherence to HIV treatment in Sokoto. However for those who had poor adherence, the factors associated included female gender, never married status, no formal education, unemployment, income less than ?9000.00, poor clinic attendance, depression, and anxiety.

Female patients were identified to have poor treatment adherence than the male. The factors associated with poor adherence among the female include being never married, no formal education, unemployment status, poor clinic attendance, presence of definite anxiety and borderline depression. However among the male, factors associated with poor treatment adherence include having no formal education, unemployed status, income less than N9000.00 per month, poor clinic attendance, borderline anxiety and borderline depression.

A study reported similar finding that the female gender were less likely to start HAART treatment⁴, twice less likely to receive antiretroviral treatment⁵ and less likely to adhere to treatment⁶. In another study among patients who were current or former user of opioid, adherence among women was 27% lower than among men (46% versus 73%, $P < 0.05$)²⁰.

The effects of unemployment and earning less than ?9000.00 monthly were associated with higher prevalence of treatment adherence among the male than the female. The social supports received by the

female patients from their spouse might have accounted for this difference. The above findings were consistent with a study on the relationship of socioeconomic factors and anti retroviral treatment where positive trend among components of socioeconomic factors such as income, education and occupation existed¹⁹.

However, among both male and female patients, poor clinic attendance was the most significant predictor of poor treatment adherence. This finding has been reported in previous study²¹. Similarly, more patients with psychiatric morbidity had poor treatment adherence compared to patients without psychiatric morbidity irrespective of whether the disorder was borderline or definite.

Other earlier studies have identified the role of psychiatric morbidity on HIV infection. In a randomized controlled study of 603 participants, a study reported that elevated affective symptoms of depression independently predicted ART discontinuation and that elevated depressive symptoms predicted a 50% higher mean viral load²². Other studies reported that non adherence was independently associated with worse depression scale scores. In fact, the consistency found in the relationship between depression and treatment adherence was compelling that it could not be ignored²³⁻²⁸.

The other interactions between psychiatric morbidity and HIV infection beyond treatment adherence underscored the need to bring research findings to clinical practice by incorporating psychiatric evaluation and management into treatment protocol. For instance, depression and anxiety disorder were reported to speed progression of the disease²⁹⁻³⁰ while depression alone has negative effect on the course and outcome²². Other studies reported that depression substantially impact on quality of life while anxiety has negative consequence on social role and mental functioning³¹.

Interpretation of these results must be done with caution as the study was hospital based and generalization of findings to the community may be difficult. In addition, the use of self reported screening instrument to determine depression and anxiety may not be diagnostic although previous studies had shown that HADS may be more useful than BDI (Becks Depression Inventory) in identifying depression³².

Also, while other methods such as electronic evaluation³³⁻³⁴ and pharmacy records⁸ have been used to determine treatment adherence in previous studies and the possible bias associated with self report, it still remained a useful method of treatment adherence assessment which had been utilized in previous studies³⁵⁻³⁸. The concept 'religiously' was used as a method of assessing good adherence to treatment because the study settings attached significant importance to religiosity. Hence this concept could be useful in religious adherent community with low education as in this study population. However, further study would be needed to validate this item.

In conclusion, while it could be argued that there was good adherence to HIV treatment in this centre where free anti retroviral drugs were available, socioeconomic variables and psychiatric morbidity such as anxiety and depression played role in the patients who were non-adherent.

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Statement of interest

The authors declare no conflict of interest with any commercial or other associations in connection with the submitted article.

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