

*Full Length Research Paper*

# Determinants of adherence to antiretroviral therapy (ART) among patients attending public and private health facilities in Nairobi, Kenya

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**For maximum suppression of the multiplication of the human immunodeficiency virus (HIV) virus and subsequent increase in the CD4 cell count, a level of adherence of 95% and above is required among the patients on Antiretroviral drugs (ARVs). Most patients on antiretroviral therapy (ART) in Nairobi are not achieving the optimum adherence level required to maintain treatment efficacy, hence the risk of drug resistance and increased burden in the public health care system. The aim of this study was to identify the factors that influence adherence to ART among HIV patients attending public and private health facilities in Nairobi, Kenya. A non-interventional cross sectional study using both qualitative and quantitative data collection methods was used. The study was carried out in the Public and Private Health facilities offering ART in Nairobi, Kenya. Four hundred and fifty People living with HIV and acquired immune deficiency syndrome (AIDS) (PLWHA) receiving ARVs in selected public and private health facilities in Nairobi, between June, 2007 to June, 2008 were selected for the study. The composite adherence ART level among patients in Nairobi was found to be 85%. The major factors that were found to constrain adherence were costs, lack of social support, side effects, time to reach the health facility, and adequate knowledge of ARVs. This study found out that majority of the patients on ART in Nairobi are not achieving optimum adherence. The major factors that lead to the sub-optimal adherence are lack of social support, lack of disclosure that one is taking ARVs, poor knowledge of ARVs, associated costs such as transport and extra food requirements and the existence of side effects.**

**Key words:** Optimal adherence, high risk sexual behavior, adherence to ART, knowledge about HIV and ART, side-effects, disclosure, treatment costs, discrimination, access to art, service providers.

## INTRODUCTION

We are in the third decade of human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) which has become the most important infectious epidemic disease in the last century. The 2008 United Nations Programme on HIV/AIDS (UNAIDS) epidemic update estimated that more than 33 million people worldwide are currently living with HIV/AIDS, with 2.7 million new infections and 2.0 million deaths due HIV in the year 2007 alone. Sub-Saharan Africa is the most

severely affected region with over 22 million people living with HIV/AIDS as at the end of 2007 (UNAIDS/WHO, 2008). Kenya is one of the countries majorly hit by the worldwide HIV epidemic, having a population of more than 1.4 million people infected with HIV (UNAIDS/WHO, 2008; National AIDS and STI Control Programme, Ministry of Health, Kenya, 2008).

Anti-retroviral therapy (ART) has been successful in dramatically decreasing the morbidity and mortality caused by HIV. These successes coupled with the availability of lower-priced drugs, availability of generic drugs and an increase in donor funding has led many developing countries such as Kenya to implement and scale

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up HIV treatment programs for its HIV positive citizens (Pallela et al., 1998). A major concern in scaling up the ART is the emergence of drug-resistant viral strains as a result of sub-optimal adherence. To prevent the emergence of such strains, optimal patient adherence to ART is necessary. Levels of adherence in excess of 95% are required to ensure treatment success, adequate viral load suppression, improved immune status and slowing of the disease progression (Paterson et al., 2000).

To date, there is very little scientific data on the level of treatment adherence and the factors that may constrain adherence in Nairobi. This study was designed to determine the factors influencing adherence to ART among patients undergoing treatment in selected public and private health facilities in Nairobi Province, Kenya.

## MATERIALS AND METHODS

This was a non interventional descriptive cross-sectional study comprising the patients receiving ART in selected public and private health facilities in Nairobi. Various data collection techniques were employed in this study. The selection of the number of study subjects was proportionate to size, based on the number of registered clients at the facility, whereby a proportion of the registered patients in selected facilities were asked to participate in the study. Systematic sampling was used to identify the patients to be interviewed at the clinics. Primary data was collected from the PLWHA on ART through semi-structured questionnaires in which a total of 450 patients were interviewed. Additional qualitative data was obtained through 8 Focused group discussions (FGDs). The participants were asked about what they knew about ARVs and whether they thought ARVs were a cure for HIV or not. The knowledge about HIV and ARVs was rated using eight questions worth one point each.

A total of 48% of the participants got a score of at least 75%. For the purpose of evaluating the impact of knowledge on adherence, a cutoff of 75% was used (> 75% good knowledge). The respondents were asked eight questions testing their knowledge on HIV and AIDS, as well as ARVs. Those who got six questions correct were awarded the 75% mark. Data checking and cleaning were done simultaneously during data collection. At the end of every field day, data was checked for completeness and consistency, and FGDs transcribed. After transcribing and cleaning, quantitative data was analyzed using the Statistical package for social sciences (SPSS). Hypothesis testing was done using Chi-square test. Independent predictors of lower adherence were determined using logistical regression analysis. A p value of < 0.05 was considered significant.

### Setting

The data was collected from both private and public health facilities. The public health facilities have a comprehensive care center where the patients are provided with free HIV care while in the private facility, the patients pay for the services. In Kenya, the policy is to initiate treatment in patients with documented HIV infection and have met World Health Organization (WHO) stage IV disease, irrespective of CD4 cell count, or advanced WHO stage III disease, including persistent or recurrent oral thrush and invasive bacterial infections, irrespective of CD4 cell count or total lymphocyte count. Another consideration was also for the patients with a CD4 cell count of 200 per mm<sup>3</sup> or less for patients in WHO stage I, II or III of having tuberculosis with a CD4 cell count of 200 to 350 mm<sup>3</sup>.

## RESULTS

A total of the four hundred and fifty patients attending both private and public health facilities in Nairobi were involved in the study, with 60% of them being females. Slightly more than half of the respondents (53%) were married, and the highest age group was 30 to 35 years. Table 1 shows a summary of the selected socio-demographic characteristics of the respondents.

The study participants were asked to state the reasons for deciding to take an HIV test. The results indicated that a relatively high percentage of the respondents (53%) got to know their status while undergoing treatment. Other reasons included a desire to be tested after learning their partner had tested positive (15%), expectant and undergoing prevention of-mother-to-child transmission (PMTCT) (14%) and 3% as a condition for overseas travel, and this forced them to test. Finally, only 12% specifically went to check for their HIV status. Figure 1 summarizes the reasons for taking an HIV test among the respondents. The results indicated that of the patients who were taking the drugs, nearly half (48%) accurately knew what ARVs were, with slightly over half (52%) not knowing what it was.

With regard to experiencing of any side effects of using ARVs, the results indicated that a large proportion of the respondents (87%) had experienced some side effects, with only 13% stating they had not experienced any side effects. The results indicated that there was a significant relationship between the experiencing side effects of ARVs and adherence. It showed that majority of the respondents who had experienced some side effects were less likely to adhere to the treatment since they took some time dealing with the side effects. These results agrees with those found by Burgos et al. (1998) who also found out that the existence of side effects is likely to influence adherence levels. The results indicated that nearly half 196 (49%) of the respondents had missed some medications, with just over half of the respondents having not missed any of the medication. There were a variety of reasons that made the patients to miss medication, namely experience of side effects, lack of social support, hiding medicines, associated costs of transport and food, among others. This results agrees with earlier results which postulated that the likelihood of a patient's adherence to a given regimen declines with polypharmacy, the frequency of dosing, the frequency and severity of side -effects, and the complexity of the regimen (Green, 2003).

The patients were asked if they had disclosed to anyone that they were taking ARVs. The results indicated that for the many of the respondents, 35% disclosed to their spouses that they were taking ARVs. Others to whom they disclosed the information on taking ARVs included the siblings (25%), parents (14%) and friends (9%). It is also worth noting that 17% of the PLWHA had never informed anyone they were taking ARVs. Figure 2 shows the results of disclosure that one is taking ARVs

**Table 1.** Distribution of the subjects according to selected socio-demographic characteristics (n = 450).

Characteristic	No. of subjects	%
<b>Age (years)</b>		
18-24	50	11
25-29	76	18
30-34	127	29
35-49	95	22
Over 40 years	89	20
<b>Sex</b>		
Male	170	38
Female	280	62
<b>Marital status</b>		
Single	171	38
Married	239	53
Separated/divorced	40	9
<b>Highest level of education</b>		
No formal education	13	3
Primary	87	19
Secondary	122	27
Tertiary	228	51
<b>Employment status</b>		
Employed	224	49
Not employed	226	51

Further, the respondents were asked if they have ever had to change treatment since they started medication. The results indicated that about 45% had at least changed treatment regimen. On probing to establish the reasons that compelled them to change the treatment regimen, the results indicated that majority (58%) had changed the medication because of side effects, another 25% was due to unavailability of drugs while 17% changed the treatment due to treatment failure.

The participants were asked to estimate in time how much time they took by public means to travel from home to the health facility, the results indicated that majority (35%) took between 30 min to 1 h to get to the facility, others took less than 30 min (28%), 1 to 2 h (16%) and more than 2 h (19%). This showed that a significant number of patients took a long period of time to get to the facility ( $\chi^2 = 40.276$ ,  $df = 3$ ,  $p = 0.00$ ). The duration taken to the health facility was found affect the level of adherence. Table 2 shows the results of the relationship between duration taken to travel to hospital and adherence level. The results when cross tabulated indicated that the duration taken to the health facility influenced the level of adherence, with 92% of those who achieved optimum adherence level having to travel only

**Table 2.** Relationship between duration taken to travel to hospital and adherence level.

Duration	Below optimum (%)	Optimum (%)	Total (%)
< 30 min	0 (0)	80 (33)	80 (26)
30 min-1 h	28 (44)	108 (44)	136 (44)
1-2 h	11 (17)	39 (16)	50 (16)
> 2 h	14 (22)	26 (11)	40 (14)
Total	63 (21)	243 (79)	306 (100)

1 h or less to the health facility.

With regards to the cost of travel to the health facility, results indicated that there was a wide discrepancy in the amount of money spent, based on the mode of transport used. The lowest amount spent was USD 0.25 and the highest amount of money spent was USD 6.25. The mean amount of money spent on transport was USD 2.13. The median was USD 1.75, mode USD 1.25 and the standard deviation was USD 1.375. Figure 3 shows the distribution of respondents by traveling expenses

## DISCUSSION

The results indicated that just about half [216 (48%)] of the PLWHA had accurate knowledge of what ARVs were and what they do to the body. There was a significant relationship between knowledge of ARVs and adherence, with those having more accurate knowledge more likely to adhere ( $\chi^2 = 106.432$   $df = 7$ ,  $p = 0.001$ ). There was a correlation between the knowledge level and the level of adherence with those with higher knowledge tending to adhere to treatment more than those with lower level of knowledge. The results of this study concurred with the study by Wenger et al. (1999) which stated that a good level of understanding about HIV by the patient, a belief that ART is effective and prolongs life, and recognition that poor adherence may result in viral resistance and treatment failure, all impact favorably upon a patient's ability to adhere. Conversely, a lack of interest in becoming knowledgeable about HIV and a belief that ART may in fact cause harm, adversely affect adherence (Wenger et al., 1999).

The results showed that majority of the respondents (87%) had experienced some side effects, with only 13% stating they had not experienced any side effects. These results concur with those found by Paterson et al. (2000), who also found out that the existence of side effects is likely to influence adherence levels (Burgos et al., 1998). The results also indicated that for the majority of the respondents, their spouses (35%) were aware that they were taking ARVs. The results indicated that those who had disclosed to the relatives and friends that they were taking ARVs were more likely to adhere to treatment because they had support from them. However, those who had kept the fact that they were taking ARVs secret were

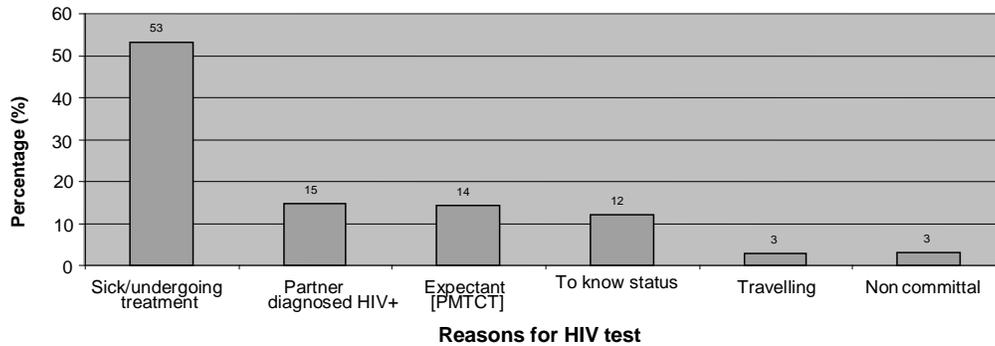


Figure 1. Distribution of respondents based on reasons for HIV test.

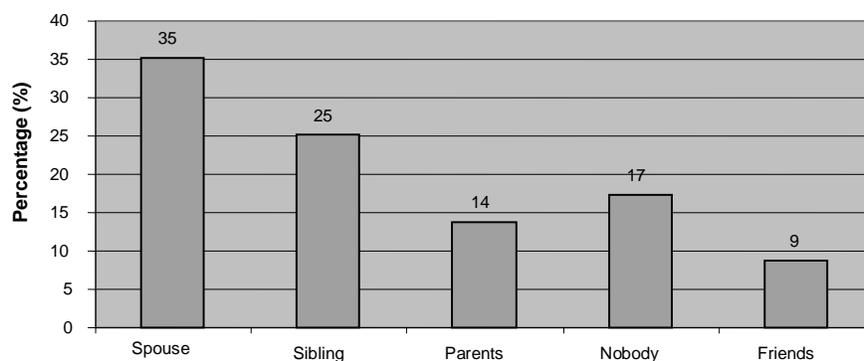


Figure 2. Distribution of Respondents based on whom they disclosed to that they are on ARVs.

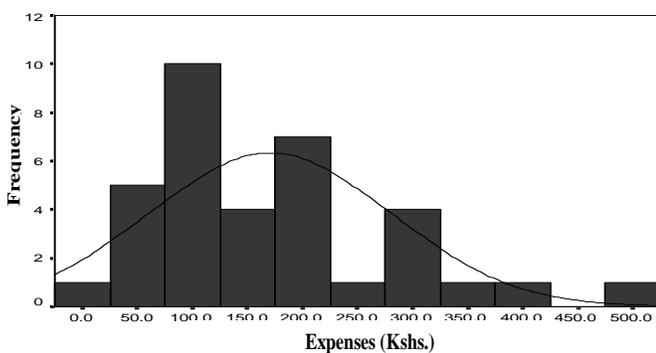


Figure 3. The distribution of respondents by traveling expenses.

more likely to default because the time for taking the drugs would come when they were with other people and this would make them default, as they had to hide. The results also concur with that by Green (2003), who said that living alone and a lack of support had been associated with an increase in sub-optimal adherence, and social isolation was predictive of sub-optimal adherence. Not living alone, having a partner, social or

family support, peer interaction, and better physical interactions and relationships are characteristics of patients who achieve optimal adherence (Motashari and Riley, 1998).

### CONCLUSIONS AND RECOMMENDATIONS

This study found out that majority of the patients on ART in Nairobi were not achieving optimum adherence. The major factors that led to the sub-optimal adherence were lack of social support, lack of disclosure that one was taking ARVs, poor knowledge of ARVs, associated costs such as transport and extra food requirements, and the existence of side effects. The health facilities offering ART should employ adequate numbers of well trained staff, as this will help cope with increasing workloads in the ART clinics, and it will also help reduce the long waiting times. There is also need to train staff in adherence counseling and continuously update their knowledge of HIV and AIDS, as this will help all the staff in the ART facilities to be able to participate in adherence counseling rather than leave it to the pharmacists only. Also, there should be sustained community mobilization

aimed at mitigating stigma and discrimination, in an effort to create an environment in which people can disclose and take their ARVs without fear of discovery.

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