

Factors Influencing Adherence To Antiretroviral Drugs Among Clients Above 15 Years Attending Comprehensive Care Clinic At Engineer Hospital

Kanyoni James¹, Kweri Joseph², Kasyoki Peter³, Rono Walter⁴, Mwangi Ann⁵, Malik Atanas⁶.

¹(Jomo Kenyatta University of Agriculture and Technology (JKUAT), College, Kenya)

²(Department of Human Anatomy, Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya)

Corresponding Author: Kanyoni James

Abstract: Medication adherence is essential to successful treatment of HIV/AIDS. Maintaining high adherence will likely prove a major challenge in Africa. Despite early reports suggesting that adherence would pose a major barrier to treatment success, a more recent research show that adherence rates in Africa are quite variable and often poor. Given the large number of patients whose disease will progress if adherence is suboptimal, a research is urgently needed to determine the patient's factors which influence adherence to antiretroviral drugs in client attending CCC.

The critical factors that influence adherence are patient factors such age, sex, cultural beliefs, socio-economic, disclosure of HIV status; patient's behavior is the critical link between a prescribed regimen and treatment outcome. The most effective regimen will fail if the patient does not take the medication as prescribed or refuses to take it at all. Consequently all things being equal, the most important factors influencing adherence are patient-related factors.

A descriptive cross section study design was conducted in Engineer Hospital. A non-probability convenient sampling technique was used. The study population of 250 HIV positive clients attending comprehensive care clinic which is the average number during the study period. The purpose of the study was to determine the patient factors that influence adherence to ART. These factors include socio-demographic factors, the level of knowledge, attitude, practice and disclosure. A closed-ended interview administered questionnaire was filled. The data was analyzed using statistical package for social science [SPSS] version 20. The data included variables such as age, education, knowledge, attitude and practice.

From the finding at Engineer hospital, level of education was low and was a strong predictor of adherence to ART.

Date of Submission: 10-08-2018

Date of acceptance: 24-08-2018

I. INTRODUCTION

Adherence to antiretroviral therapy (ART) is crucial in reducing the risk of emergence of HIV resistant strains. Adherence to ART among Persons Living with HIV/AIDS (PLWHA) is influenced by several factors related to the patient, the medication, and health facilities. However cultural differences may differ across geographic areas of the country.¹

The antiretroviral regimens are complex, toxic and have several side effects. There is a disruption of patient's daily activities due to scheduled follow-up visits and this for this reason it makes maintaining adherence over the long term challenging. Yet the individual and public health benefits of ART are adherence dependent. Inadequate adherence results in antiretroviral drugs being maintained at insufficient concentrations to suppress HIV replication in infected cells to lower the plasma viral load. In addition, suboptimal adherence can accelerate development of drug-resistant HIV and mitigate ART's role in reducing HIV incidence and transmission. Promoting adherence is especially important as these treatments become increasingly available and affordable for people living with HIV (PLHIV) in developing countries. Consequently, more attention is being focused on issues related to ART adherence.²

The latest estimates from UNAIDS shows that there were 36.7 million people living with HIV in 2015, up from 33.3 million in 2010 and this was as result of continuing new infections, people living longer with HIV and an increase general population. Global prevalence has leveled since 2001 and was 0.8% in 2015. 1.1 million People died of AIDS in 2015, a 45% decrease since its peak in 2005. Deaths have declined significantly due to use of antiretroviral treatment s availability. HIV stills remain a leading cause of death worldwide and the

main culprit of death in Africa. There were about 2.1 million new infections in 2015 which translates about 5,700 new infections per day. Women represent half (51%) of all adults living with HIV worldwide. HIV is the leading cause of death among women of reproductive age. Gender inequalities, differential access to service, and sexual violence increase women's vulnerability to HIV, and women, especially younger women, are biologically more susceptible to HIV. Young people, ages 15-24, account for approximately 35% of new HIV infections in sub-Saharan Africa, young women 15-24 account for 25% of all new HIV infections among adults, even though they represent only 17% of the adult population. Globally, there were 1.8 million children living with HIV, 110,000 AIDS-related deaths, and 150,000 new infections among children in 2015.³

Kenya has the joint fourth-largest HIV epidemic in the world among Mozambique and Uganda in terms of the number of people living with HIV about 1.6 million people in 2013. Approximately 58,000 people died from AIDS-related illnesses in the same year but this dropped by 32% between 2009 and 2013. There are now 1.1 million children orphaned by AIDS.⁴

To combat this, various programs and initiatives have been put in place to curb the spread of AIDS and reduce disease progression among those infected. One of these measures is the use of antiretroviral treatment (ART). Currently the AIDS burden in Kenya is high with about 6% prevalence rate which translates to approximately 1.6 million Kenyans being infected with HIV/AIDS. Kenya has the fourth highest AIDS burden globally coming after South Africa, Nigeria and India respectively⁵

II. MATERIAL AND METHODS

This a descriptive cross section study that was conducted in Engineer Hospital from April 2015 to May 2015. The study population of 250 HIV positive clients attending comprehensive care clinic which was the average number during the study period.

Study Design: A cross section study design will be used to conduct the study.

Study Location: Engineer hospital is a public hospital located in Nyandarua County. Engineer lies east of the Aberdare ranges and thus receives a significant proportion of rainfall more than 1,000 millimeters annually. The prevailing topographical feature is the Aberdare ranges. The area is heavily forested. The soils are volcanic loamy soils which support agriculture and mixed farming in the area. The main economic activity is farming (crop cultivation and dairy farming). Food crops grown in the area include potatoes, maize, cabbages, carrots and green peas. Dairy farming produces milk and wool.

Study Duration: April 2015 to May 2015.

Sample size: 156 patients.

Sample size calculation: The sample size was determined using the Fisher, et al (2002) formula. Since the population visiting the CCC is 256 which is less than 10,000, the desired sample size of respondents at 95% Confidence interval and level of accuracy at $p=0.05$ was calculated using Fisher et al (2002) formula which gave a sample size of 156 patients

Subjects & selection method: The study population was drawn from

Inclusion criteria:

1. All active HIV positive clients above 15 years on ART for more than 6 months enrolled Engineer hospital,

Exclusion criteria:

1. All active HIV positive clients aged less than 15 years on ART
2. All clients on ART for less than 6 months
3. Inactive patients on ART
4. ART naïve patients.

Procedure methodology

Voluntary and fully informed consent was obtained from all the respondents before their inclusion into this study. All the information given by the respondents was treated with utmost confidentiality. The information was used only for purposes of the study and not for any other purpose. Names of respondents were not revealed. A researcher administered questionnaire was used to collect data and a pretest was conducted to ascertain the suitability of questions in the interviewer's schedule.

The study subjects, were assessed using researcher administered questionnaire to collect detailed information on the socio-demographic details of the respondents that may influence adherence to ART, the influences of the level of knowledge, attitude and practice on adherence to ART and also influence of disclosure on adherence to ART

Statistical analysis

Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 20 and presented in pie charts and bar graphs.

III. RESULT

The organization of the results corresponds to study’s three specific objectives. Serially, they are: socio-demographic details of the respondents that may influence adherence to ART, the influences of the level of knowledge, attitude and practice on adherence to ART and also influence of disclosure on adherence to ART.

Demographic and socioeconomic characteristics

Demographic characteristics of the study included: gender, age distribution, marital status, and religion. The study data showed that majority of respondents were below 50 years; that is, belonging to the age categories of 15yrs -19yrs 15(9.7%),20yrs-29yrs 38(24.7%),30yrs-39yrs 43(27.9%) and 40yrs – 49 yrs 37 (24%). In contrast, least proportion of respondents was in the age category of above 60 years. The study results also indicated that married couples are more affected than single individuals this agrees well with the KDHS 2003 survey and the KAIS 2007; which showed that married couples are at greater risk of contracting HIV compared to the unmarried individuals.

Gender

From the data, most respondents were female 103(66.9%) and male 51 (33.1%) (See, figure 4-3 below). This is consistent with national population of Kenya where women exceed men, with life expectancy of women being 57 years and that of men being 54 years (Republic of Kenya, 2003c). Women constitute 58% of those infected with HIV in sub-Saharan Africa (UNAIDS, 2007). And adolescent girls are three to four times more likely to be infected than boys. Women are not just extremely vulnerable to HIV; they are also overburdened by it. For example, they care for the sick and dying (Leserman *et al.*, 1996; McGrath *et al.*, 1996). Culturally, women suffer from a lack of empowerment in their relationships that prevents them from negotiating safer sex with partner (Body, 2009; Odiwuor, 2000).

Table 1: Gender distribution of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	51	33.1	33.1	33.1
	female	103	66.9	66.9	100.0
	Total	154	100.0	100.0	



Figure 1 : A pie chart demonstrating participant’s gender

Age distribution

Given that chief mode of transmission of local HIV epidemic is heterosexual contact, the youths are at heightened risk of infection.. Also, it is the youths that are dying off more. In countries where HIV prevalence is 10% in adult population, almost 80% of deaths in young adults aged 25 – 49 years will be associated with HIV (UNAIDS, 2003).

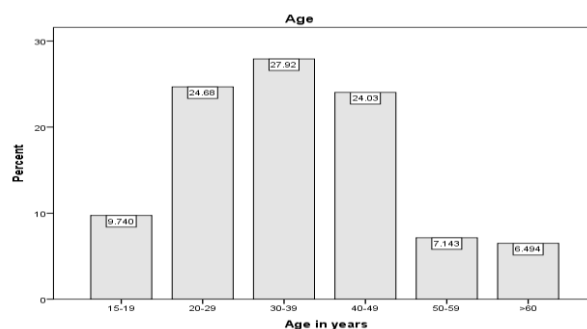


Figure 2: Age Distribution of the Respondents

Marital Status

Figure 3 below summarizes the distribution of respondents according to marital status across two study sites. Types of marriage of respondents were categorized as: single, married, divorced and widowed (see, figure 4-2 below). Study data showed that the largest proportion of respondents 38(60.3%) and 166 (45.5%) in were married

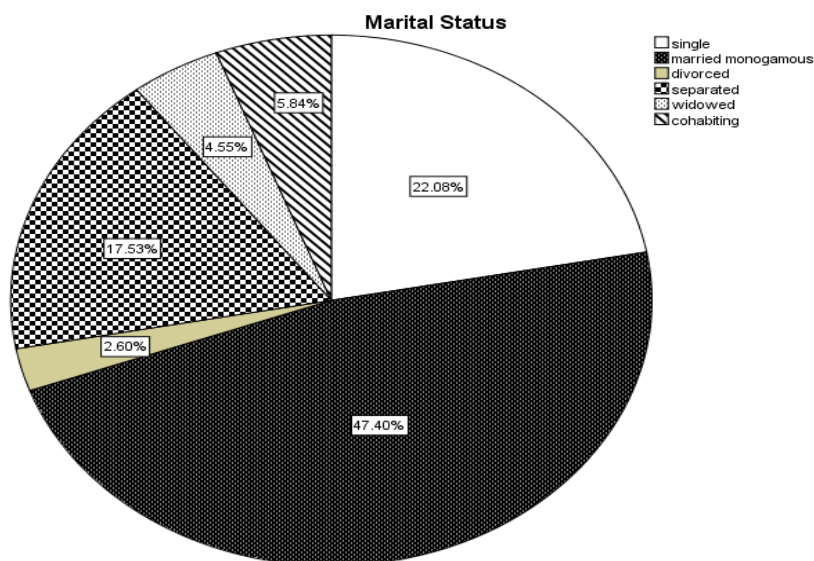


Figure 3: Marital Status of the Respondent

Level of Education

From data, it emerged that most respondents either had reached primary education 87(56.5%), secondary education 40 (26%), tertiary/college education 20 (12.9%) and 7(4.5%) had no formal education .This may be attributed to the fact that the study was conducted in a rural and peri-urban settings where many of those with higher than secondary education would normally migrate to a slightly urbanized town to engage in formal employment or are still pursuing higher education, while those with lower than secondary education are likely to remain in rural settings to engage in the informal employment that does not require special skills or education. Also, it is 58% of Kenyans that have completed primary level education (Republic of Kenya, 2013c). Literacy and educational levels impacts on HIV and AIDS including prevention, treatment and care, and lessening of impacts (Republic of Kenya, 2003d). Hypothesis 2 of study corresponded with objective 1 and pertained to relationship between socioeconomic characteristics and adherence level.

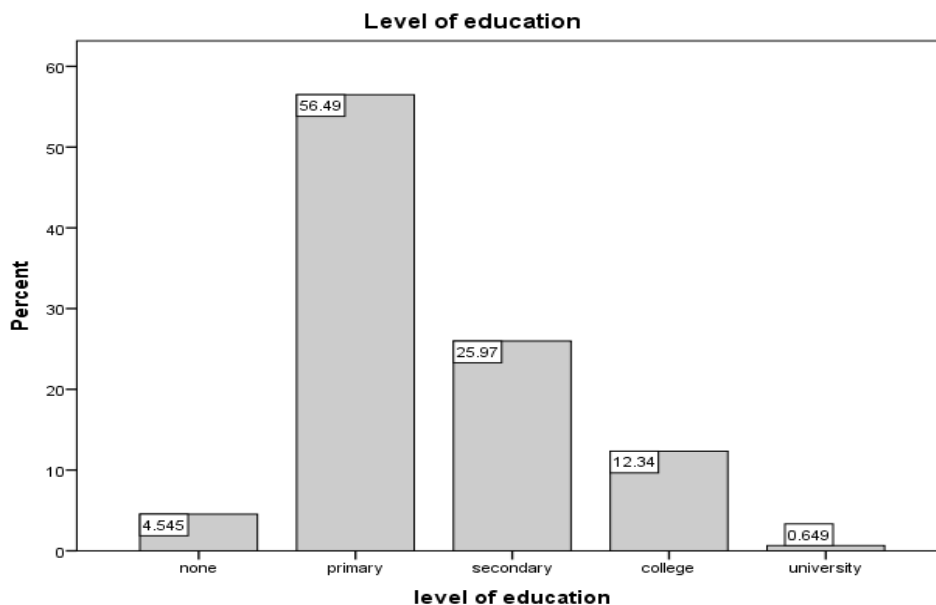


Figure 4: Respondent Level of Education

Religion

The study looked into religion of respondents; this included subsets of Christianity such as Catholicism, Muslims and Protestantism. Most of the respondent 60.9% were Protestants, 36.3% were Catholics while Muslims represented the smallest percentage 1.9%

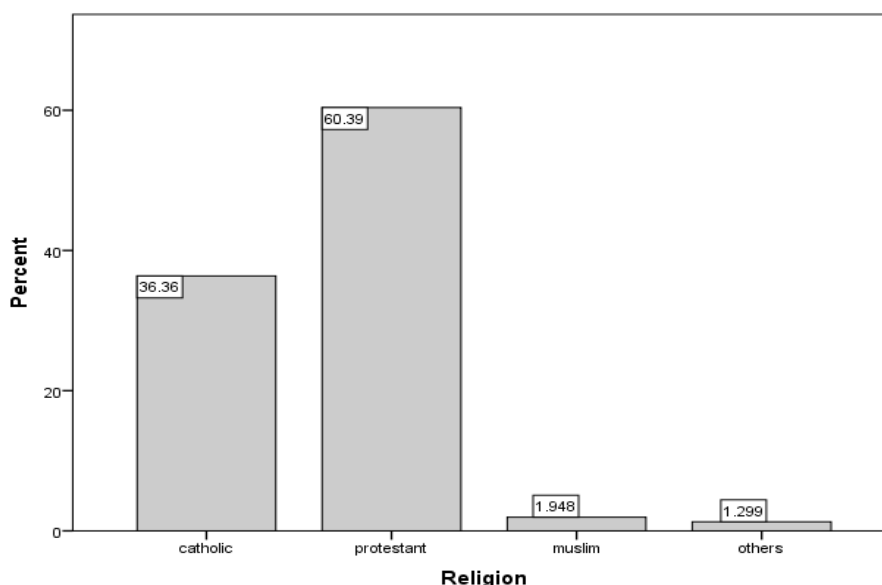


Figure 5: Religion of the Respondent

Type of Employment of the Respondent

Poverty levels were higher among the respondent in Engineer hospital with 27.7% with no source of income while 13.6% were salaried, 20.7% self-employed, 29.8% casual laborer and 8.4% were housewives. Most of the respondent reported to be living on the equivalent of less than one US dollar per day. Those on salaried job earned an average income of Ksh 7,207 (median salary ksh 4,000). The lowest and highest monthly incomes reported among men were Ksh 100 and Ksh 30,000. The income differences were related to the occupation of the respondents. Since a bigger proportion were unemployed or self-employed, their mean monthly income was also lower. Employed respondents generally reported higher monthly incomes than the self-employed

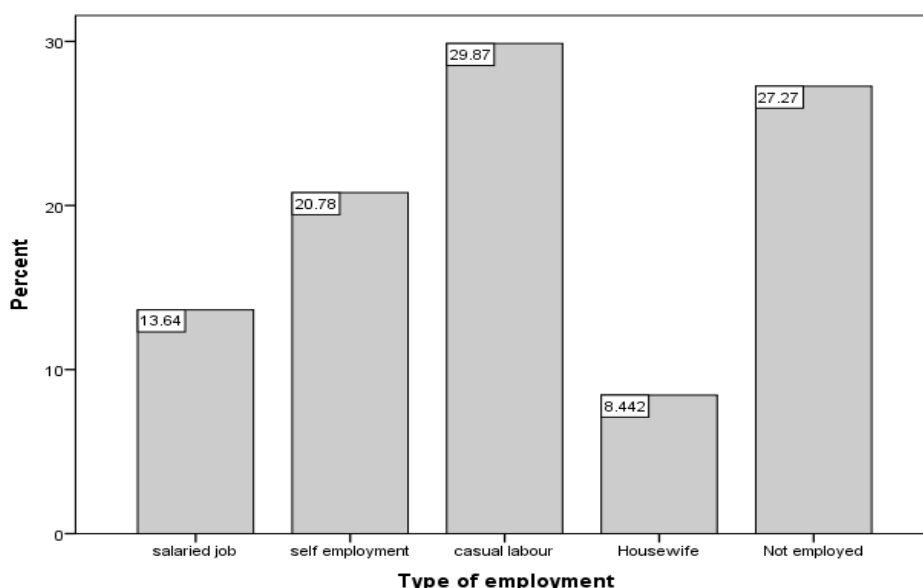


Figure 6: Employment level of the respondent

Table 2: Amount of income earned

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<5,000	27	17.5	17.5	17.5
	5,000-10,000	67	43.5	43.5	61.0
	10,001-20,000	17	11.0	11.0	72.1
	>30000	1	.6	.6	72.7
	no income earned	42	27.3	27.3	100.0
	Total	154	100.0	100.0	

Knowledge, attitude and practices on adherence to ART

Questions regarding patients’ knowledge, attitude and practices were intended to check the patients’ basic knowledge of ART and evaluate a possible relationship of this knowledge with ART adherence.

At Engineer Hospital, few respondents knew what HIV infection 43 is (27.9%) while majority said is due to curse 60 (39.0%) while other thought is due to witchcraft 49 (31.8%). However, knowledge of the two parameters did not seem to significantly affect adherence to ART. Most respondents could not differentiate between HIV infection and AIDS 61(39.6%) while however, poor knowledge of the two parameters did seemed to significantly affect adherence to ART. 70(45.5%) said HIV is curable,44.8% is incurable while 9.7% don’t know

Table 3 :Respondent knowledge, attitude and practice on adherence to ART

What is HIV?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	curse for sinners	60	39.0	39.0	39.0
	caused by witchcraft	49	31.8	31.8	70.8
	a virus that attacks immune system	43	27.9	27.9	98.7
	don't know	2	1.3	1.3	100.0
	Total	154	100.0	100.0	
What is AIDS?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	occur when the body is overcome by HIV virus & becomes weak	50	32.5	32.5	32.5
	is the same as HIV	61	39.6	39.6	72.1
	disease that occur immediately after one gets HIV	38	24.7	24.7	96.8
	don'tknow	5	3.2	3.2	100.0

	Total	154	100.0	100.0	
Is hiv curable?	Frequency	Percent	Valid Percent	Cumulative Percent	
yes	70	45.5	45.5	45.5	
no	69	44.8	44.8	90.3	
don't know	15	9.7	9.7	100.0	
Total	154	100.0	100.0		

Factors affecting adherence to ART as reported by the patients

Patients were asked to state how they follow instruction while taking their medication. The answer “all the time” was given (57.14%) of the patients while “most of the time” was cited by (38.96%) of the patients as the main factors affecting adherence to their medication. “Sometimes”, and “never” were cited by (3.2%) and (0.64%) of the patients respectively.

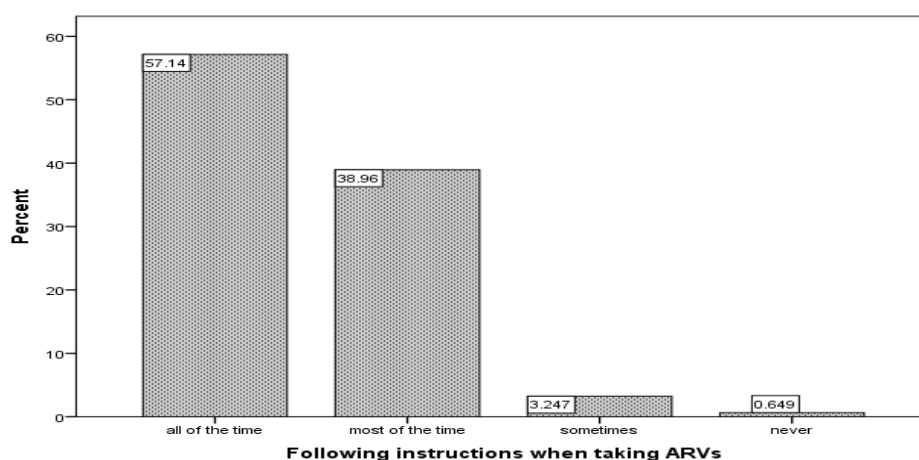


Figure 7: Following instruction when taking ARVs

Reasons for Missing ARVs Doses as Stated by the Respondent

The reasons stated by patients at Engineer hospital for missing their medication included being busy 44.8%, travelling 22.8%, forgetfulness 1.9%, stigma 17.5% and side effects 13.6%. These reasons have been reported in other studies on adherence to ART. Pierre *et al.* (2006) compared adherence to antiretroviral therapy between patients in France and in sub-Saharan Africa. Adherence was measured using patients’ self assessment of their pill taking. Sixty one percent of the patients in France and 31% of those in Africa stated “being busy” as the main reason for missing doses. In the same study, 18% of patients in France and 21% of patients in Africa reported “forgetfulness” as the main reason for missing doses. The proportion of patients reporting “side affects” as the cause of missed doses was 5% for the patients in France and 8% for the patients in Africa

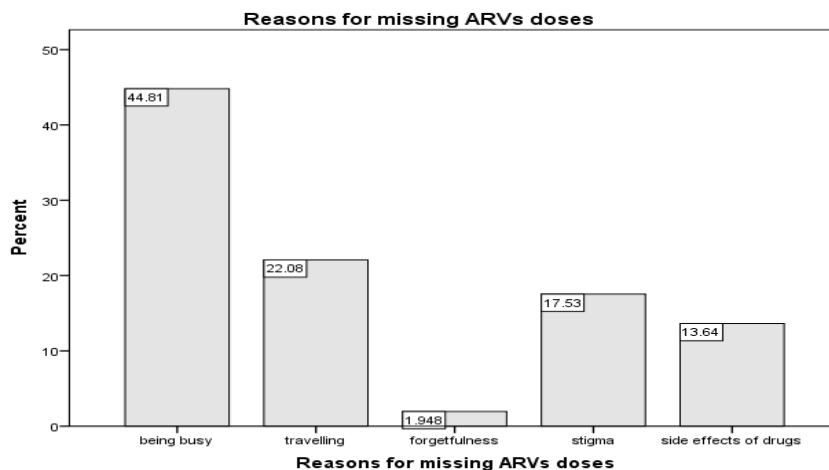


Figure 8: Reasons for missing ARVs doses

Disclosure status of respondents

Majority of both male and female respondents (55.4%) had disclosed their HIV status to family, friends or relatives. There was no significant difference in the disclosure status of between the sexes.

Other studies conducted elsewhere have yielded different results. A study by Stirratt *et al.* (2006) examined the relationship between HIV serostatus disclosure and adherence to antiretroviral therapy. The study was conducted with 215 HIV-seropositive patients who demonstrated poor adherence to client who had not disclosed.

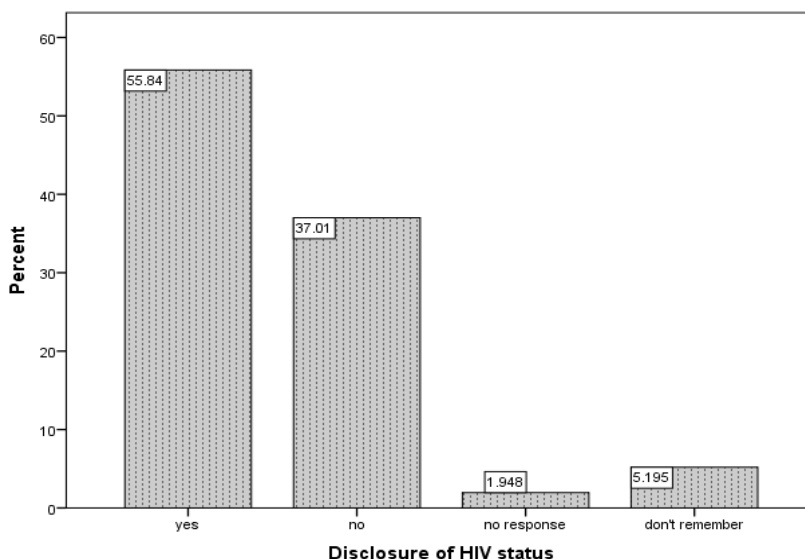


Figure 9: Respondents disclosure of HIV status

IV. DISCUSSION

Adherence levels and age

In the sample of patients interviewed at Engineer hospital, older patients (60 years or more) constituted only 6.5% of the patients interviewed. Most of the patients- 144 (93.5) - were between the 15 and 59 years old. The fact that there were relatively fewer patients outside this age group may have masked differences in adherence levels between younger and older patients as the latter sample was too small. Studies in other countries have shown an influence of age on adherence to ART. Hinkin *et al.*, (2004)

HIV-infected patients in the United States. The mean adherence rate for the entire cohort was 80.7%, with older patients (≥ 50 years) demonstrating significantly better medication adherence than younger patients (87.5 versus 78.3%). Logistic regression analyses found that older patients were three times more likely to be classified as good adherers (defined as $\geq 95\%$ adherent). Golin *et al.* (2002) found that younger patients were less likely to be adherent than older patients

Adherence levels and gender

At Engineer hospital, gender was not found to be a predictor of adherence level to ART as there was no difference in adherence levels among male and female patients. Many studies have demonstrated that gender is not a predictor of adherence levels to ART.

Adherence to ART and level of education

At Engineer hospital, level of education was low and was a strong predictor of adherence to ART.

Various studies have yielded conflicting findings on the relationship between adherence and level of education. In a cross-sectional study of 366 patients in Spain, subjects with a low level of education had the worst adherence while those with a university degree had the best (Gordillo *et al.*, 1999). A notable fact in this study was the complexity of regimens. The patients were on protease inhibitor-based ART which requires more pills to be taken per day often with dietary restrictions. It is conceivable that a higher level of education would make it easier to understand complex regimens hence increasing adherence levels in this sub-group of patients

In a study in an African cohort in Botswana by Weiser *et al.* (2003), the odds ratio of adherence for patients who did not complete secondary school as compared with those with higher levels of education was showing that lower levels of education were actually associated better adherence to ART

Adherence to ART and marital status

The study at Engineer did not find marital status to be a factor in adherence to ART. A study by Byakika-Tusiime et al. (2005) at three treatment centers in Kampala Uganda found that marital status was associated with non-adherence with married people more likely to adhere to ART. The study involved 304 patients and adherence information was based on patient self-reports from structured interviews as well as unstructured qualitative interviews.

Further research is probably needed to gain more insight into the influence of marital status on ART adherence. A possible explanation for the findings of the Uganda study would be that married people living together who are both on ART would provide each other with adherence support hence enhance medication taking. However, it is not known whether they exist important differences in the relationship dynamics between married couples in Uganda and in Nyandarua County in Kenya. Thus being married may be a positive predictor

Adherence to ART and occupation

Occupation was found to be a significant factor at Engineer Hospital with employed patients as a group exhibiting poorer adherence levels than the self-employed and unemployed groups. A possible explanation for the results observed at Engineer hospital is that the employed patients interviewed generally had relatively busier schedules than the other groups and their lifestyles usually involved travelling, sometimes quite early, from their residences in order to arrive at their workplaces on time and getting home from work late in the evening. On the other hand, given that farming is one of the main occupations for self-employed individuals in Nyandarua County, this group usually worked within their homesteads and it would probably be easier for this group to develop and follow a regular medication taking schedule compared to the patients who were employed. A few studies have explored the relationship between adherence to ART and occupation of patients. A multicentre cohort study by Kleeberger et al. (2001) in the US involving 5,622 patients found no relationship between adherence and employment status. However, the study populations comprised only homosexual and bisexual men.

Knowledge of basic ART facts and adherence to ART

The study at Engineer found that knowledge of basic facts about ART was not correlated to the patients' adherence levels. It appears from findings of various studies that patients in general may still adhere to ART medication even without solid knowledge of their treatment. It could perhaps suffice for patients to be aware of the importance of strict adherence to their ARV medication for them to exhibit high levels of adherence.

Knowledge of basic facts of ART has not been shown to be correlated with adherence levels. Golin et al. (2002) found that knowledge of some basic facts about ART was not correlated to the patient's

Factors affecting adherence to ART as reported by the patients

The reasons stated by patients at Engineer hospital for missing their medication included being busy, travelling, forgetfulness and stigma. These reasons have been reported in other studies on adherence to ART. Pierre et al. (2006) compared adherence to antiretroviral therapy between patients in France and in sub-Saharan Africa. Adherence was measured using patients' self assessment of their pill taking. Sixty one percent of the patients in France and 31% of those in Africa stated "being busy" as the main reason for missing doses. In the same study, 18% of patients in France and 21% of patients in Africa reported "forgetfulness" as the main reason for missing doses. The proportion of patients reporting "side affects" as the cause of missed doses was 5% for the patients in France and 8% for the patients in Africa.

In an assessment of adherence to ART medication by patients living in an impoverished community in South Bronx New York, Weidle et al. (1999) conducted confidential interviews with patients who were on ART to assess their adherence to the ART medication. Additionally, each respondent was requested to voluntarily fill out an anonymous self-administered questionnaire further assessing their adherence to ART medication in the previous month. Not all patients interviewed agreed to fill out the anonymous questionnaire.

The answers obtained were assigned to response category in a list of responses. For the response categories that were similar for Engineer hospital and the study by Weidle et al. (1999), the proportions of patients in each category were markedly different: "forgotten", 8% for Engineer hospital and 39% for the New York (NY) population; "side effects", 8% for Nyeri PGH and 14% for the NY population. The differences in the responses could be because of differences in the way data was obtained in the 2 studies. In addition, the socio-demographic characteristics of the two study populations were different, with the NY study focusing on an impoverished community while the in Engineer Hospital study included a heterogeneous group of patients with varying socio-economic profiles

Adherence to ART and disclosure of HIV status

This study at Engineer showed no relationship between adherence to ART and disclosure of HIV status by the patient to others. Other studies conducted elsewhere have yielded different results. A study by Stirratt et al. (2006) examined the relationship between HIV serostatus disclosure and adherence to antiretroviral therapy. The study was conducted with 215 HIV-seropositive patients who demonstrated poor adherence. Participants who reported greater serostatus disclosure to others demonstrated higher rates of adherence. In Tanzania, Ramadhani et al. (2005) concluded that disclosure of HIV serostatus to persons other than health care workers at the Infectious Diseases Clinic was protective against non-optimal adherence to ART. The study was conducted in Northern Tanzania and included 185 patients.

A possible reason for the observation at Engineer hospital that disclosure had no effect on adherence levels is the small number of patients who had not disclosed their status to their relatives or friends. These were only 57, representing 37% of the patients interviewed. This might have reduced the statistical power of the study to detect any differences in adherence.

V. CONCLUSION

In this study, factors influencing adherence to antiretroviral therapy at the Engineer hospital are presented. Various socio-demographic differences were observed between the male and female patients on ART but the adherence levels between the sexes were essentially the same.

Female patients were more likely to be widowed, separated or divorced while male patients were more likely to be in a steady relationship or married. Females were also worse off than men when it came to occupation with a greater proportion being unemployed and a bigger proportion of men being employed. Consequently, the average income of men was significantly higher than that of women. However there was no difference in the levels of education between the two groups.

There was influence adherence among the respondents with the employed patients exhibiting relatively lower adherence levels. Age, gender, level of education, marital status and knowledge of HIV disease were found not to significantly affect adherence.

RECOMMENDATIONS

Application of the findings

i) Unfortunately, the definitive intervention to promote adherence to antiretroviral therapy has yet to be developed. To date, interventions have either been ineffective or have produced only short-term benefits (British HIV Association, 2001). However, after a comprehensive evaluation of published and unpublished research articles, Stone (2001) suggested, among others, the following strategies for improving adherence to ART that may also be utilized at Engineer hospital.

(a) Developing a set of adherence-focused activities that are provided for each patient, including an assessment of readiness for HAART, education regarding importance of adherence and consequences of non-adherence, an individualized dosing-instruction sheet with photographs of medications, structured follow-up assessment of adherence, and problem-solving for adherence-related difficulties that are identified.

(b) Giving patients the time and opportunity to develop a warm, caring patient-provider relationship with the health care providers, even if they are not yet receiving ART or do not feel ready to begin receiving ART.

(c) Making it easy for patients to call and obtain answers to their questions, for instance by giving them the cell phone numbers of the members of staff, and allowing the patients to come in at short notice if problems develop.

(d) Utilize a multidisciplinary team approach so that clinician, nurses, pharmacists and counsellors will be available to coordinate some of the adherence-related activities. This also increases the likelihood that patients will find someone on the care team to whom they can comfortably relate and from whom they can get needed information about their medications.

(e) Scheduling intensive and frequent visits during the month after initiation of ART. These should focus on identifying and solving adherence problems and difficulties with medication tolerance. These visits can also be used to obtain early measures of adherence and to reinforce the correct dosing schedule.

(f) Providing access to reminder devices, such as beepers, watches with alarms, or medication organizers (pill boxes) for patients who believe that they may benefit from their use.

(g) Assessing adherence at each visit and using each visit as an opportunity to discuss adherence with every patient

All these proposals are feasible and inexpensive and may be attempted in the setting of a public hospital to improve adherence to ART.

ii) The category of employed individuals among the patients on ART should be given particular attention by the healthcare team to assist them develop strategies of optimizing their adherence to ART to prevent early development of resistance and subsequent treatment failure. .

iii) At national level, the Ministry of Health and the National AIDS and STI Control Program should issue guidelines for adherence measurement and monitoring and conduct regular reviews of adherence data to identify facilities whose patients exhibit low adherence levels. Such facilities can then receive additional technical and/or financial support to address the causes of low adherence by their patients.

iv) Develop a scale that can reliably measure the perceptions to the ART plan and the knowledge and experience about HIV/AIDS.

REFERENCES

- [1]. Yaya I, Saka B, Landoh DE, et al. Predictors of adherence to antiretroviral therapy among people living with HIV and AIDS at the regional hospital of Sokodé, Togo Issifou. *BMC Public Health*. 2014;14:1308. doi:10.1186/1471-2458-14-636.
- [2]. Hansana V, Sanchaisuriya P, Durham J, et al. Adherence to Antiretroviral Therapy (ART) among People Living With HIV (PLHIV): a cross-sectional survey to measure in Lao PDR. 2013:1-11.
- [3]. Who. Who _ Hiv_Aids. 2015.
- [4]. AVERT. HIV and AIDS in Kenya | AVERT. 2012. <http://www.avert.org/hiv-aids-kenya.htm>.
- [5]. NASCOP. Kenya AIDS Indicator Survey 2012: Final Report. *J Acquir Immune Defic Syndr*. 2014;66Suppl 1:1-530. doi:10.1097/QAI.000000000000152.
- [6]. Who. Defining adherence. Who. 2003:128www.who.int/chp/knowledge/publications/adherence_report/en/?
- [7]. Heyer A, Ogunbanjo G. Adherence to HIV antiretroviral therapy. *SA Fam Pr*. 2006;48(9):9-12.
- [8]. Barclay TR, Hinkin CH, Castellon SA, et al. Age-associated predictors of medication adherence in HIV-positive adults: health beliefs, self-efficacy, and neurocognitive status. *Health Psychol*. 2007;26(1):40-49. doi:10.1037/0278-6133.26.1.40.
- [9]. Karpiak S. Adherence to antiretroviral therapy (ART) in older adults living with HIV/ AIDS. *Psychol AIDS ExchNewsl*. 2014;(January 2014):1-5. /pi/aids/resources/exchange/2014/01/index.aspx.
- [10]. Paasche-Orlow MK, Cheng DM, Palepu A, Meli S, Faber V, Samet JH. Health literacy, antiretroviral adherence, and HIV-RNA suppression: A longitudinal perspective. *J Gen Intern Med*. 2006;21(8):835-840. doi:10.1111/j.1525-1497.2006.00527.x.
- [11]. Kasumu LO BM. Knowledge and attitude towards antiretroviral therapy and adherence pattern of HIV patients in southwest Nigeria. *Int J Infect Control*. 2014;10(3):1-8. doi:10.3396/IJIC.v10i3.024.14.
- [12]. Kamau TM. Psychosocial correlates of adherence to antiretroviral therapy (ART) in people living with HIV in Kenya. 2011;71:4797.<https://www.lib.uts.edu.au/goto?url=http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2011-99040-265&site=ehost-live>.
- [13]. Martín MT, del Cacho E, López E, et al. Adverse side effects of antiretroviral therapy: relationship between patients' perception and adherence. *Med Clínica* . 2007;129(4):127-133. <http://www.ncbi.nlm.nih.gov/pubmed/17663966>.
- [14]. Max B, Sherer R. Management of the adverse effects of antiretroviral therapy and medication adherence. *Clin Infect Dis*. 2000;30Suppl 2(Supplement_2):S96-116. doi:10.1086/313859.
- [15]. Castleman T, Seumo-fosso E, Cogill B. Tony Castleman, EleonoreSeumo-Fosso, and Bruce Cogill. *Public Health*. 2003. http://pdf.usaid.gov/pdf_docs/Pnacw463.pdf.
- [16]. Campos LN, Guimaraes MDC, Remien RH. Anxiety and depression symptoms as risk factors for non-adherence to antiretroviral therapy in Brazil. *AIDS Behav*. 2008;14:289-299. doi:10.1007/s10466-008-9435-8.
- [17]. Boateng D, Awunyo-Vitor D. Knowledge, Perceptions and Practices on Antiretroviral Therapy in Farming Communities in Ghana: A Study of HIV Positive Women. *Public Heal Res*. 2012;2(5):136-142. doi:10.5923/j.phr.20120205.04.
- [18]. Machtinger EL, Bangsberg DR. Adherence to HIV Antiretroviral Therapy. *HIV InSiteKnowl*. 2006. <http://hivinsite.ucsf.edu/InSite?page=kb-03-02-09>.
- [19]. Stone VE a. Strategies for Optimizing Adherence to Highly Active Antiretroviral Therapy: Lessons from Research and Clinical Practice. *Clin Infect Dis*. 2001;33(6):865-872.

- [20]. <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=ovfte&AN=01451458-200109150-00018>.
- [21]. Viciano P, Rubio R, Ribera E, et al. [Longitudinal study on adherence, treatment satisfaction, and effectiveness of once-daily versus twice-daily antiretroviral therapy in a Spanish cohort of HIV-infected patients (CUVA study)]. *EnfermInfeccMicrobiolClin*. 2008;26(3):127. doi:13116748 [pii].
- [22]. Access O. The Influence of HIV-Status Disclosure on Adherence , Immunological and Virological Outcomes among HIV-Infected Patients Started on Antiretroviral Therapy in Dar-es-. 2015.

IOSR Journal of Humanities and Social Science (IOSR-JHSS) is UGC approved Journal with Sl. No. 5070, Journal no. 49323.

Kanyoni James "Factors Influencing Adherence To Antiretroviral Drugs Among Clients Above 15 Years Attending Comprehensive Care Clinic At Engineer Hospital." *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)*. vol. 23 no. 08, 2018, pp. 59-70.