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Correlates of Non-adherence to Anti-Retroviral Therapy (ART) among Adolescents at Namungalwe Health Centre IV Iganga District

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Abstract: This investigation was a step towards creating awareness about reasons as to why, in spite of availability of ART drugs, the rate of adherence is still low, and there are various cases of non-adherence. This has increased the rate of transmitting opportunistic infections such as diarrhea, whooping cough, Tuberculosis, and related infections that make use of opportunity of weakened immunity in the body. The study was at Namungalwe Health Center IV, in Iganga District. The study comprised a sample of 63 out of 90 respondents categorized into; midwives, clinicians, expert clients, and HIV infected adolescents. A questionnaire structured into items explaining non-adherence was set-up and distributed to respondents in the various categories to generate results. Analysis was done using principal component analysis to extract significant factors. The validity of study was determined through pre-survey tests using three experts who cross checked questions set with study objectives and recommended the most appropriate questions. On the other hand, reliability was determined using the Crombach Alpha Model, results of which indicated that socio-demographic factors measured 0.796 for 9 items, and health facility related factors measuring 0.831 for 28 items. The study used stratified sampling to categorize respondents by gender and designation, and simple random sampling techniques to select individual respondents from each category. Results indicated that socio-demographic factors such as sex, age, education level, nature of caretaker, distance to health facility, and time of diagnosis, reason to go for HIV testing, time of starting treatment, and feeling of patients during treatment predict non-adherence to ART among adolescents. In addition, Facility related factors influence non-adherence to ART among adolescents.

Key Words: Non-adherence, ARTs, Socio-demographic characteristics, Adolescents

1. Introduction

Worldwide, it is estimated that about 2.1 million adolescents aged 10–19 years are living with HIV. With improved to antiretroviral therapy (ART), most of the children with vertical transmission of HIV would soon become adolescents living a positive and stress-free life. Kim, Sarah, Filder, & Ward (2014) cite that though HIV infection account for over 40% of the new HIV infections in the world, as attributed to high-risk sexual behaviors, and despite the fact that ART controls viral replication, maintains health and reduces onward viral transmission, the rate of adherence to ART among adolescents is significantly very low over the world. Lowest ART adherence among adolescents, according to these studies, was reported in North America, whereby 53% was reported as opposed to the worst expected adherence of 95%, followed by Europe with 62% adherence, and South America with 63% adolescent adherence as opposed to 95% expected average rate of adherence.

In Africa, adherence to ART among adolescents is reported to be low still and varying among countries based on fcators such as family background, time of closure of health facilities, economic status of families, and side effects of ARTs. In South Africa, for instance, out of the 1.2 million adolescents with HIV AIDS, only 20% adhere to ARTs, (Nuffield Foundation, 2015). Much as Botswana and Rwanda are praised for achieving universal access target of 80% and more, and Ethiopia, Zambia, Namibia and Senegal close on the way to this achievement, (Ayalu & Sibhatu, 2012), in Uganda, various studies report poor adherence to ARTs, most especially in rural areas attributing it to factors such as stigma and disclosure, (Nabukeera, et al., 2015).

Non adherence to ART is another great issue of concern for this study. Adherence to ARTs by adolescents is an important step towards meeting their care, support and prevention needs. However, reports from available publications are quite alarming. Globally, Karin (2013) established that major factors hindering adherence include uneven distribution of health facilities where adolescents can access ARTs, stigma related issues, lack of adequate counselling and guidance sessions, as well as failure of adolescents to regularly keep in touch with counselors in health facilities.

About 127,000 adolescents aged 10 to 19 are living with HIV in Uganda. Good adherence in care is a prerequisite to successful management of adolescents living with HIV (ALHIV). According to Birungi, Obare, Kwaak, & Harriet (2009), many adolescent girls normally disappear from HIV and AIDS programs once they become pregnant. Accordingly, a number of such adolescents are reported to be giving birth to HIV infected babies due to failure to continue subscribing to ARTs as long as they are supposed to maintain it. Livingstone, Nandhi, & Shakuntala (2017) noted that though Uganda is at some point considred by the international community as being one of the success stories in ART adherence, evidence from within the boundaries of Uganda are indicative of the fact that the level of retaining adolescents on ARTs is considerably very poor. Poor ART adherence increases the risk of viral drug resistance, limits treatment efficacy leading to disease progression and reduced future therapeutic options thus increasing the risk of transmission due to unsuppressed viral replication (UNAIDS & JUNPoHA, 2010). When records of Namungalwe health center IV were reviewed, it was found out that only 45% of the adolescents attending the HIV clinic are adherent to their ARTs leading to increased opportunistic infections and deaths among this group. Failure to continue with ART uptake leads to negative conditions such as anaemia, Tuberculosis, and cryptococal meningitis, which cause stigma around an HIV infected adolescent, leading to increased morbidity and mortality. The fact that ART services are available at Namungalwe Health Center, and counselors readily available, this study set to identify factors hindering adherence to ART among adolescents.

2. Literature Review and Studies

With improved access to Antiretroviral Therapy (ART), most of the children with vertical transmission of HIV have chances of growing older and becoming parents. By 2010, it was estimated that about 127,000 adolescents aged 10 to 19 were living with HIV in Uganda, (UNICEF, 2011; UNAIDS & JUNPoHA, 2010). Research by Paterson, et al., (2000) shows that poor adherence is associated with poor treatment out-come. In the case of ART, optimal adherence is taking 95 % and above of prescribed medication. Poor adherence to ART could lead to drug resistance that translates into higher costs not only to the individual but also to the national ART programs. This is because when patients fail on their first line regimens, they have to be switched to more expensive second line drugs.

Adherence to ART among adolescents has been noted to be low. Moreover, some studies have indicated that being well/healthy is associated with poor adherence. In Uganda, the 2013 revised national ART treatment guidelines recommend that all those below 15 years are started on ART regardless of their immunological or clinical stage of the disease. The resulting large numbers of healthy children and adolescents starting ART raises concerns about adherence to medication. In 2010,

retention in care using 72 cohorts and 226,307 patients found that the 24-month retention rate in Africa was 70 % and 36-month estimate was 64.8 %. This is an unacceptably low rate in resource-limited settings. In Uganda, the retention in care for 617 adolescents in The AIDS Support Organization (TASO) ART programs was 96 % at 6 months and 90 % at 12 months, (United States Agency for International Development, 2014). There is therefore existing adherence data for all those on ART in their patient records at health facilities. Data on retention in care also exists in the national tools located at the health facilities. Adherence to ART among adolescents has been described among smaller numbers of ALHIV.

Some of the barriers are at the national level. For instance, many health workers are not trained in providing ART to children and do not have the confidence to start them on ART. The Prevention of Mother-to-Child Transmission of HIV (PMTCT) program has grown to include over 300 Health Units in the country (all Districts are covered). However, there is still very poor linkage with care of these infants. HIV tests for children under 18 months are not widely available. The availability of HIV testing directly affects uptake because a person's status has to be known before treatment can begin. Even where testing is widely done, for instance at Mulago Hospital Paediatric wards where about 45 children test positive every month, few of the children end up on ART because of problems like fear of disclosure and stigma. In the rural areas, ignorance about availability of services, poor referral systems, and transport costs are notable hindrances to uptake of free ART (Elvin, et al., 2011).

Adherence studies done in Uganda have shown that adherence to ART is better where ART is free, and better still in research settings and community-based programs. Two studies of children have shown that stigma directly affects adherence. In one of them, lack of disclosure of the child's HIV sero-status to any other person was significantly associated with non-adherence, whereas in the other, failure to inform children of their own status was associated with worse adherence, (Inwani & Cherutich, 2005).

Individual factors are so much linked to environmental or social factors. Nachega (2006) carried out a study on different factors to ART adherence and identified that reasons for increased adherence to ART among young people is mainly due to societal treatment which is free from discrimination. On the other hand, however, HIV infected persons shun adherence to ARTs especially if they discover that the society discriminates HIV infected people (Karin, 2013).

Some studies found out that the restrictions attached to ARTs partly inhibit adherence among adolescents. Margaret (2004) in her study about factors affecting adherence to ARTs established that most of the young people want to drink alcohol and to eat all sorts of what they call good food. However, health workers advise victims to refrain from drinking alcohol while taking ARTs, which confuses most victims and they prefer drinking to ARTs or combine both. Compliance to

restrictions or non-compliance is based upon surrounding environment which among others consists of peer group influence to drink and or to shun drinking and continue with drugs.

The Center for Disease Control report published in 2013 in the United States titled Socio-economic factors affecting HIV risk revealed five social factors which affect adherence to ARTs. Poverty was not looked at in terms of inability to purchase ARTs. This is because globally, ARTs are given free of charge. However, besides poverty of knowledge, and other resources, the issue of transport costs was highly emphasized here. In many rural areas, especially in Sub Saharan Africa, HIV infected persons hardly have the means of transport to reach health facilities. Though the government of Uganda in this context has tried to establish health facilities to various levels of the country from Sub County to District level, in many areas, health facilities are inaccessible by patients. This results into untimely or failure to go for HIV testing, regular medications is not adhered to and most importantly, patients are not able to reach out for ARTs and similar services. This situation does not leave Iganga an exception whereby many villages in Iganga regard Namungalwe health facility as their most immediate but its proximity to their residence is not fair at all, (Elvin, et al., 2011).

3. Methodology

A cross sectional design was chosen for this study targeting one concentrated area (Namungalwe HCIV, where data could have been gathered once in one month and findings are to be got from health workers and HIV infected adolescents, all of whom are available at the health facility. Jarvis (2017) establishes that a cross-sectional survey type of design allows for studying people of different demographic characteristics at the same time. Similarly, this study comprises health workers and HIV infected adolescents thus, a cross sectional survey. It involved descriptive techniques of data analysis and use of quantitative study tools to a large extent and to a least extent, qualitative findings. The use of quantitative approach owes to presence of many HIV infected persons who would easily give answers if they are given time to fill in questionnaires compared to engaging them person by person.

3.1 Study Population
The population for this study were basically HIV infected adolescents. The table below shows specific numbers of categories of people in this study population.

Table 1: Study population

C/N	Category	Total Number (N)
1.	Midwives	4
2.	Clinicians	4
3.	Expert clients	5
4.	HIV infected adolescents	77
	Total	90

3.2 Sampling Procedures
In order to obtain the required sample size of the study, probability sampling procedure was used. According to Mohammed & Negida (2017), a probability sampling procedure is where an investigator is sure of including categories of the study population and it leads to fair generalization of research data.

(a) **Stratified sampling**

If a study population consists of different categories of respondents such as midwives, nurses, expert clients and HIV infected adolescents in this study, then the population is already stratified into N1, N2, N3, N4, etc., thus stratified sampling was applied in this context as follows:

Table 2: Stratified sampling approach

C/N	Category	Total Number (N)
1.	Midwives	N1 = 4
2.	Clinicians	N2 = 4
3.	Expert clients	N3 = 5
4.	HIV infected adolescents	N4 = 50
	Total	N = 63

Therefore, the study population has been stratified into four categories, which sum up to N. However, the aspects of gender balance were not compromised. The researchers were also considered the categories in terms of their sex, males and females respectively.

(b) **Simple random sampling**

When a study population has been stratified into elements of similar characteristics, then each member in

a single category stands higher chances of being selected. This is to say each category in N1 has an equal chance of being included, and the same applies to each member in N2, N3, and N4.

However, the most important point to note here is that since members in N1, N2 and N3 were included directly as already stated in 3.2 under sample table, Simple

random sampling was mainly used to select 63 respondents who formed the sample of 77.

3.3 Data Collection Instruments

The study consists of respondents who were interviewed and those that were fill in questionnaires. Questionnaires were purely structured consisting of sections to indicate the demographic characteristics and questions according to study variables, while interview guides were unstructured. Therefore, two data collection techniques were used namely; questionnaires and interview guides. The questionnaire was used to obtain data from 63 sampled HIV infected adolescents. Close ended questions were used in this respect to obtain responses. On the other hand, was used to obtain data from midwives, expert clients, and clinicians because detailed information was required from them to compare

3.3.1 Quality Control Issues

First a pre-survey of the study area was made to consult respondents about the best approach of study tool they need. Following this, a team of 3 research assistants was trained in six hours telling them about the aim of this research and discussing with them the details of the study so that they carried out their assistance without going off the intended objectives. Questionnaires were pretested with other respondents with similar characteristics in two neighboring health centers to confirm whether they understood questions in the same way. This checked on validity and reliability of the study. Table 3 below is an illustration of the reliability results for the study.

authenticity and to confirm validity of responses from HIV infected adolescents.

Table 3: Results from Cronbach Alpha for reliability of research instruments

No.	Name of Variable	No. of Items	Cronbach's Alpha coefficient	Cronbach's standardized coefficient
1.	Social-demographic Factors	9	.796	.810
2.	Health Facility Related Factors	28	.831	.790

3.4 Data Analysis

Data from questionnaires were clearly presented in frequency distribution tables and then interpreted into percentages following calculations made from frequencies. On the other hand, data from interviews were presented descriptively using subthemes from questions set as guidelines.

3.4.1 Plan for Dissemination

After making pretests and training research assistants, the researchers used the suggested sample selection procedures to distribute questionnaires to each individual in each category. Research assistants kept checking on respondents to collect questionnaires that had been filled.

3.5 Ethical Issues

To ensure adherence to code of conduct, the researchers obtained a letter of introduction from International Health Science University. This letter served as an official permission to respondents and as an assurance

that the study was particularly academic. Following this, permission from the District Health Officer, Iganga, was obtained, plus consent of respondents. Respondents were asked to respond voluntarily without forcing them. In addition, only views in line with the study objectives were discussed to avoid irrelevant information. Anonymity was rest assured for any information that would otherwise not be advised to publish.

4. Results and Discussion

Factors that explain non-adherence to ART among adolescents in Namungalwe Health Center in Iganga District

Seven factors influencing non-adherence in Table 4 were established using Principle Component Analysis under the Factor Loading. The significance of analysis was determined using Kaiser Meyer Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Spherity as indicated in the table below;

Table 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.591
Bartlett's Test of Sphericity	Approx. Chi-Square	768.545
	Df	136
	Sig.	.000

The rule that governs the table above is that Kaiser-Meyer-Olkin measure of sampling adequacy must be from 0.5 onwards, and the p-value must be significant at p<0.05. Therefore, findings in table 4 above show that

KMO value meets the recommended value of P<0.05 thus the items were subjected to factor loading and five components were extracted as illustrated in Table 5. Interpretation of factors is to the effect that any item that loaded above 0.5 was considered to be significant. To

establish the extent of effect, the coefficients were multiplied by 100%.

Table 5: Factor loadings for Correlates of non-adherence to ART among the youths

		Component				
		1	2	3	4	5
1.	Feeling listened to			.736		
2.	Being given chance to state problems and ask questions				.723	
3.	Being treated with respect			.449		
4.	Feeling trust for health workers	-.426				
5.	Having privacy during consultation and counseling	.768				
6.	Conduciveness of the clinic environment for treatment					.826
7.	Being helped by health worker about ART experience				.903	
8.	Patient's satisfaction and trust in the provider and clinic staff		-.471			
9.	Being included in decision-making processes			.452		
10.	Linking daily medication taking to daily activities			.857		
11.	Feeling well when using alcohol	.595			.556	
12.	I normally smoke				.425	
13.	Friendliness of the caretaker	.896				
14.	Discrimination against HIV/AIDS victims if they know	.834				
15.	Regarding it as shame to take ARTs in society		.753			
16.	Reminder to take ART medicine by family members		.819			
17.	Nature of talks by friends outside family about HIV status		.868			

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 12 iterations.

The rule in Table 5 above is that all factors with absolute value of extraction ≤ 0.4 were extracted. In the first component, *Feeling trust for health workers* was extracted, while, *being treated with respect* and *being included in decision-making processes* were extracted. On the other hand, in component 3, and factor 12-*I normally smoke* was extracted in component 4. Therefore, out of 17 factors, 12 factors were identified to have an influence on non-adherence to ART.

First, non-adherence to ART by adolescents is influenced by *being helped by health worker about ART experience* (.903). This high percentage rank denotes that most adolescents do not get adequate help from health workers concerning side effects of ART. Just like any other normal drug, ART has its side effects too, which include body fatigue, dizziness, a feeling of general body weakness, among others. However, other body changes may continue to occur based on the environment in which a victim is living. In addition, adolescents claim that health workers do not communicate such information during prescriptions thus causing a problem in following regular ART intake intervals. These results are in line with Marhefka & Koenig (2005) addressing about self-disclosure whereby they opine that self-disclosure to sexual partners is considered an important process in preventing HIV transmission and that it helps to enhance shifting from caregivers' disclosure to HIV-infected children to decisions concerning self-disclosure among adolescents with PAH. The authors reveal that if health workers are helpful, they can easily come out and seek necessary advice to continue living positively.

The second greatest factor was friendliness of caretakers, with 89.9% representation. This factor had the highest percentage of respondents who acknowledged that they receive care from unfriendly people with whom they stay. The implication of this is that adolescents lack courage to take ART on regular bases. They feel left out and perceive HIV as stigma in society before their caretakers. According to Karin (2013), the major factors hindering adherence include uneven distribution of health facilities where adolescents can access ARTs, stigma related issues, lack of adequate counselling and guidance sessions, as well as failure of adolescents to regularly keep in touch with counselors in health facilities. Theerfore, if health workers are not friendly and helpful, non-adherence is an expected outcome.

The other factor-influencing non-adherence is Nature of talks by friends outside family about adolescents' HIV status ranking 86%. In this, adolescents were asked whether their friends outside the family talk well about the HIV status of adolescents. The negative talks about HIV status of adolescents makes them feel discriminated and unsuitable to be in society. Majority of the adolescents were concerned about the negative talks by their friends thus those who had already been initiated on ART could not be consistent or failed to adhere to terms and conditions of ART prescriptions. The results are also similar to various others which state that as Botswana and Rwanda are praised for achieving universal access target of 80% and more, and Ethiopia, Zambia, Namibia and Senegal close on the way to this achievement, (Ayalu & Sibhatu, 2012), in Uganda, various studies report poor adherence to ARTs most

especially in rural areas attributing it to factors such as stigma and disclosure, (Nabukeera, et al., 2015).

Table 5 above also shows that -*Linking daily medication taking to daily activities* (.857) was the third factor. This was investigated owing to the fact that adolescents staying with busy relatives have regular work to do. This coupled with the side effects of ART, which include dizziness and body weakness, explain why adolescents initiated on ART cannot balance intake of ART and daily work. In other studies, it is also reflected that poor adherence is related to medication issues whereby Paterson, et al., (2000) identifies that poor adherence is associated with poor treatment out-come and that in the case of ART, optimal adherence is taking 95 % and above of prescribed medication. Poor adherence to ART could lead to drug resistance that translates into higher costs not only to the individual but also to the national ART programs.

Further, non-adherence to ART is influenced by -*discrimination of the community against HIV/AIDS victims* (.834) yet another great factor. One of the ways in which the community can know about a person's HIV/AIDS society is when the victims freely share the information with friends so as to live freely and avoid spreading it to uninfected persons. However, many community members consider it a taboo to stay with someone who has HIV/AIDS. As a result, an adolescent finds it better to ignore ART intake so as to die or to disguise so as either to avoid public humiliation (psychological) or to protect their image, *Conduciveness of the clinic environment for treatment* (.826) is another factor which influences non-adherence to ART. This is in such a way that the mood in which infected adolescents are welcomed is not good, the way they are handled at hospitals is also not that good plus the aspect of privacy, which may not be spelt out in health facilities. These make the victim of HIV/AIDS feel insecure and decides to dodge or even stop coming for more ART prescriptions. Other studies also indicate that there are factors so much linked to environmental or social factors. Nachega (2006) identifies that reasons for

increased adherence to ART among young people is mainly due to societal treatment, which is free from discrimination. On the other hand, Bkarin (2013) established that HIV infected persons shun adherence to ARTs, especially if they discover that the society discriminates HIV infected people.

Besides the above, *even the people these adolescents stay with at home do not remind them to take ART medicine* (.819). This explains that caretakers of majority adolescents are not friendly. Victim's understand the act of unfriendliness as discrimination. They also need close monitoring by family members as a way of encouraging them take drugs, and assuring them of their worthiness to continue living.

Table 6 below assesses the extent to which individual factors, socio-demographic factors, health facility related factors and health worker related factors influence non-adherence to ART among adolescents in Namungalwe health center, Iganga district.

Socio-demographic factors and none-adherence to ART among adolescents

Model 2 of findings in table 4 show that socio-demographic factors significantly influence non-adherence to ART among youths in Namungalwe Health Center, Iganga district such that *(R^2 = 0.225; p=0.003<0.05)*. This means that socio-demographic characteristics of sex, age, education level, nature of caretaker, distance to health facility and time of diagnosis, reason to go for HIV testing, time of starting treatment, and feeling of patients during treatment predict a 22.5% influence on ART adherence rates among adolescents in Namungalwe Health Center, Iganga district. However, since the influence maybe positive or negative, the researchers went ahead to determine those factors which influence positively and those others that influence negatively. This was by running Principle Component Analysis with Varimax method of Rotation. Results were obtained as indicated in Table 6.

Table 6: Socio-demographic factors which influence non-adherence to ART among adolescents

No.		Component		
		1	2	3
(1)	Sex		.631	.630
(2)	**Age**		**-.570**	
(3)	Education Level	.757		
(4)	Caretaker	.809		
(5)	Distance to facility	.703		
(6)	**Time of first diagnosis**			**-.485**
(7)	Reason to go for testing	.813		
(8)	Time of starting treatment	.864		
(9)				
(10)	**How patients feel since they started treatment**	**.498**		
	Extraction Method: Principal Component Analysis.			
	a. 3 components extracted.			

The highlighted results represent those factors that had high percentages of adolescents agreeing that they are

prevalent, while the rest are representative of factors which pose negative influence on adherence to ARTs by

adolescents. Factors which pose positive influence were three; Age represented by -.570 which is less than 0.5, a level to which a factor is extracted. Table 6 above also shows that there are six factors that pose a negative influence on adherence to ART by adolescents in Namungalwe Health Center thus leading to a conclusion that socio-demographic characteristics are to a certain extent responsible for the failure of adolescents to adhere to ART prescriptions thus reducing on rate of adherence. The six factors are; Sex (0.631), Education level (0.757), Caretakers (0.809), Distance to facility (0.703), reason to go for testing (0.813), and time when adolescents started treatment (0.864).

Facility-related factors and non-adherence to ART among adolescents

The 28 factors explaining health-facility related factors were computed to get the average mean and determine whether they predict any outcomes in adolescents' adherence to ART. Model 3 of findings show a statistically significant influence posed by Health-Facility related factors on non-adherence to ART $(R^2 = 0.372; p=0.000<0.05)$ implying that a 37.2% influence on non-adherence to ART is predicted by health facility related factors. Like in the previous subsection, the factors are two-tailed in such a way that there are those with negative influence and others with positive influence. In the Principle Component Analysis results, seven factors were found to have a positive influence while 11 factors pose negative influence towards non-adherence. Table 7 below treats any factor below 0.5 as one with influence.

Table 7: Health Facility related factors which influence Non-adherence to ART

	Component						
	1	2	3	4	5	6	7
FACILITY1	.829		.509				
FACILITY2	.910						
FACILITY3	.910						
FACILITY4							.768
FACILITY5	.871						
FACILITY6	.922						
FACILITY7	.722						
FACILITY8		-.512		-.579			
FACILITY9			-.593	-.597			
FACILITY10		-.438		-.823			
FACILITY11	.407				.721		
FACILITY12					.452	.541	
FACILITY13	.538	.408			.569		
FACILITY14					.905		
FACILITY15			.903				
FACILITY16		-.495	-.415				
FACILITY17			.584				
FACILITY18						.848	
FACILITY19			.418				.726
FACILITY20						.587	
FACILITY21		.735					
FACILITY22				.812			
FACILITY23		.701		.474			
FACILITY24		.860					
FACILITY25			.911				
FACILITY26			.820				
FACILITY27		.677		.430			
FACILITY28		.836					

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 10 iterations.

The seven highlighted factors pose a positive influence. In other words, they explain the extent to which Health-Facility related factors reinforce adolescents to attend and follow prescriptions for ART regularly as prescribed by health specialists.

FACILITY8-Knowledge of where and when to get resupply of drugs is known to adolescents undertaking ART, FACILITY9-possible interactions with traditional or other drugs, FACILITY10- knowledge about dangers of alcohol use while undergoing ART intake is obvious,

FACILITY16-Knowledge about effects of missing dosage, FACILITY19-Incuring extra costs as a result of taking ART, FACILITY23-Pleasantness of clinical environment and FACILITY27-clear assessment of self-reports to prevent patients from overestimating adherence.

On the other hand, the eleven (11) factors with negative influence or factors which are responsible for failure of adolescents to adhere and remain on ART drugs are; FACILITY1-*the disease process from HIV to AIDS (82.9%)*, in that as the disease advances, they tend to fear continuing with dosage. Many resort to poison or stay without ART intake till they die. In fact, several adolescents just wish to die early. Another negative influencing factor is FACILITY2-*ways in which the disease affects the body (91%)*, whereby it may go slowly and viral load becomes undetectable or it may be detected then sometime after detection is not realized. This makes some adolescents believe that they are either healed or are feeling healthy and do not require any more intake of ART.

FACILITY3-*the ways in which ART works* (91%) has also contributed a lot to non-adherence to ART among adolescents. In this case, FACILITY4-*ways of using ART drugs as prescribed by the medical professionals or specialists (76.8%)*, in that at times, due to psychological interventions brought about by the drugs to cease normal memory, adolescents end up forgetting prescriptions, and without reminders, they end up missing out or dodging if not completely stopping the intake.

More factors include; FACILITY5-*the need to continue treatment (87.1%)* is not seen by the adolescents undertaking ART thus it affects the registration of more patients on regular bases, FACILITY6-*Lack of solutions or alternatives in case of forgetting the pill (92.2%)* implying that health workers either do not remind the patients regularly or it is because most of them stay with relatives who are not mindful enough to remind them of regular intake. FACILITY7-provision of information on the side-effects which occur and how to respond to them (72.2%), FACILITY11-dangers of smoking are not known as represented by 72.1%, FACILITY12-providing patients with basic level of adherence-related information and support (54.1%), FACILITY13-availability of special support for staff engaged in management of HIV/AIDS at the facility, FACILITY14-ART being readily available (90.5%), FACILITY15-inquiries by the health worker on whether a patient has missed out a dose (90.3%), FACILITY17-attempts by health workers to count pills before giving them to patients to ascertain the period they will take before getting others (58.4%), FACILITY18-inquiries by the health worker if the patient is taking other medicine (84.8%). By asking whether adolescents use other drugs, it is a way of getting room to counsel patients about dangers of using other drugs, which are not ART. FACILITY20-the ability of families to give up other responsibilities and attend to the treatment of patients (58.7%), FACILITY21-availability of written records to patients when they go to hospital for drugs

(73.5%), FACILITY22-availability of transportation and childcare (81.2%), FACILITY24-convenience in scheduling appointments (86%), FACILITY25-the Health-worker takes seriously all complaints about side effects/physical/emotional problems and address them sincerely (91.1%), FACILITY26-the health worker/officer suggestions to overcome specific obstacles the patents may have mentioned (82%), FACILITY28-Clinicians should assess patients' motivation to successfully adhere to ART (83.6%).

5. Conclusion and Recommendations

5.1 Conclusions
Socio-demographic factors significantly influence non-adherence to ART among adolescents in Namungalwe Health Center, Iganga district such that ($R^2 = 0.225$; $p=0.003<0.05$), thus sex, age, education level, nature of caretaker, distance to health facility, time of diagnosis, reason to go for HIV testing, time of starting treatment, and feeling of patients during treatment predict a 22.5% influence non-adherence to ART among adolescents.

Conclusively still, findings show a statistically significant influence posed by Health-Facility related factors on non-adherence to ART among adolescents ($R^2 = 0.372$; $p=0.000<0.05$) implying that a 37.2% influence non-adherence to ART among adolescents is predicted by health facility related factors.

Finally, the conclusion showed that Health-Worker related factors have a statistically significant influence non-adherence to ART among adolescents in Namungalwe Sub County, Iganga district, ($R^2 = 0.379$; $p=0.000<0.05$). This is a direct implication that 37.9% of the negative influence non-adherence to ART among adolescents is predicted by health-worker related factors.

5.2 Recommendations
Continuous monitoring of both adherence and correlating it with clinical outcomes will create an interactive feedback mechanism that could lead to optimal clinical states and improved quality of life for patients. There are needs for further research and development in the area of ART adherence, adherence support, and patient behavior.

Diagnosing and treating health problems such as depression, reducing substance abuse, improving patient and provider relationship, counseling and enhancing family, and community support mechanisms are shown to improve adherence, as well as intervening on modifiable barriers to adherence before starting ART

A meta-analysis by Amico and colleagues indicated that adherence interventions may be efficacious when targeted at individuals who are identified or anticipated to have poor adherence

Electronic reminders, pill organizers, medication-event monitoring systems (MEMS) to record dosing behavior, use of internet, educations services, use of phones, and

so forth can be used to enhance rates of adherence to ART among adolescents.

Employ adequate numbers of well trained staff. More trained staff are needed to cope with increasing workloads in ART clinics. This will also help clients by reducing waiting times.

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