Factors Affecting Poor Adherence to Antiretroviral Therapy among Adolescents Attending Antiretroviral Clinic at Masaka Regional Referral Hospital Masaka City

Epongu Isaac Etilu

Faculty of Clinical Medicine and Dentistry Kampala International University Western Campus Uganda.

ABSTRACT

This study determines factors influencing poor adherence to Antiretroviral Therapy among adolescents attending ART Clinic at Masaka Regional Referral Hospital (MRRH) in Masaka City, Central Uganda. A descriptive cross-sectional research design was used to carry out this study. Data checking and cleaning were done by the entire research team under the direction of the researcher. Data were checked for completeness and consistency. Data were entered into Microsoft Excel and analyzed using SPSS v.20. Logistic regression analysis was done to identify the relationship between dependent and independent variables. Descriptive statistics were presented as frequency tables, graphs, charts, P-value, and Odds ratios. 103 participants in ART were interviewed. Out of these, the majority (61.2%) were aged 16-20, 56.3% were male, 63.1% were out of school, 76.7% were married and 66.0% were Baganda. Out of 103 participants studied, the overall non-adherence level was (29)28.2%. The current study found an association between age, gender, knowledge about adherence, distance to the health facility, health education about adherence, waiting time at the health facility, and attitude of health workers with poor adherence. Additionally, pill burden, over-experienced side effects, and having a reminder to take drugs were significantly associated with poor adherence to drugs. The level of poor adherence to ART among adolescents living with HIV is still high. Predictors of poor adherence include; age(13-15years), being male, having no knowledge about adherence, residing in rural areas, having no health education, residing far away from the health facility, long waiting hours, bad attitude of health workers, having pill burden, having no reminder to rake medication and previous experience of side effect.
Keywords: Antiretroviral Therapy, Adolescents, Health facility, Health workers, HIV/AIDS.

INTRODUCTION

Adolescence is typically described as the years between 13 and 19 which is the transitional stage from childhood to adulthood [1, 2]. However, in this study adolescents are described as between 13 to 20 years of age. Adolescence is a period of mental, physical, and emotional maturation where commonly individuals undergo behavioral experimentation, identity formation, take many risks and face difficult choices in romantic relationships, sexual behavior, and alcohol and recreational drug use [3, 4]. Adolescents and young people represent a growing share of people living with HIV worldwide [5, 6]. In 2016 alone, 610,000 young people between the ages of 15 to 24 were newly infected with HIV, of whom 260,000 were adolescents between the ages of 15 and 19 [3]. Into the third decade of the HIV/AIDS epidemic, there are 34 million people living with HIV in the world, of whom five million are aged between 15 and 24 years [7]. UNAIDS estimates that 2.0 million adolescents aged 10–19 were living with

HIV in 2014 [8]. The vast majority of people living with HIV are in low- and middle-income countries [9]. Sub-Saharan Africa is the most affected region, with an estimated 25.6 million people living with HIV in 2015 [10-13]. Adherence to ART is key for a good prognosis of HIV/IDS care [9]. However, estimates of poor ART adherence among adolescents living with HIV in low and middle-income countries vary substantially [14-16]. Despite increasing access to ART, several studies worldwide have found decreased adherence and rebound in mortality in adolescents receiving ART as compared to adults and young children [17, 18]. Both good adherence and retention in care are a prerequisite to the successful management of adolescents living with HIV. Poor adherence is associated with poor treatment outcomes [19-21]. In the case of ART, optimal adherence is taking 95 % and above of the prescribed medication [22, 23]. Treatment adherence is one of the strongest predictors of virological failure, development of drug resistance, disease progression, and death. Poor adherence to combination antiretroviral therapy (CART) is common in both developing and developed nations [24, 25]. In Uganda, there is growing concern about loss to follow-up and sub-optimal adherence to ART as significant barriers to care [26]. There is very minimal information about the causes of the low adherence to ART among adolescents in Masaka District yet it carries a considerable prevalence of the disease burden [26], hence the need for this study to establish the factors influencing non-adherence to antiretroviral therapy among HIV/AIDS patients attending the Antiretroviral Therapy clinic in Masaka regional referral hospital, Masaka District.

METHODOLOGY
Study design
A descriptive cross-sectional research design was used to carry out this study. It is descriptive because it details information about the factors associated with poor adherence to antiretroviral treatment among adolescents attending the ART Clinic of MRRH, Masaka City in a statistical way and also cross-sectional because data is collected at one point in time in a short period.

Area of Study
The research was carried out at Masaka regional referral hospital Masaka City, located in Central Uganda. It is a government-aided Hospital that serves as the main public referral hospital for the central region. It is supported by both government and developmental partners.

Study population
The study targeted all patients attending the ART clinic at Masaka regional referral hospital for at least 3 months.

Sample size determination
This researcher used Kish's formula,

$$N = \frac{Z^2(p(1-p))}{\varepsilon^2}$$

Where;
N = the maximum sample size
p= 86% (Rutterford *et al.* [27])
ε = margin of error on p (set at 5%)
z= standard normal deviate corresponding to 95% confidence level (=1.96)

$$N = \frac{1.96^2(0.86(1-0.86))}{0.05^2} = 94$$

The researcher will add 10% (9) to the sample to make it 103 participants.

Sampling technique
Due to scarcity of time, purposive sampling was used where all adolescent patients visiting the ART clinic on the days of data collection were considered till the required number was achieved. Where a patient is not interested in being included in the study, the next patient was considered.

Inclusion criteria
All adolescent HIV patients on ART treatment attending the facility aged 13-20 years of age, on ART, and willing to participate in the study were included.

Exclusion criteria
Patients that were debilitated, very sick, or with mental disabilities were excluded from the study

Data collection tools

In this study, quantitative data were collected using a researcher-administered questionnaire. A standardized interviewer-administered questionnaire containing both closed (structured) and open-ended (semi-structured) questions on individuals, health systems, and drug factors that can affect adherence to ART was used.

Data collection procedure

Data collection took place in May 2022. After self-introductions; the purpose of the study was explained to the participants in a private area identified by the investigators. Participation in the study was voluntary. Informed consent was sought from all participants, which they signed to indicate acceptance to participate in the study. An interviewer-administered questionnaire was used to collect data in a quiet and private place. The interview was conducted in English and translated into the local language for those who did not understand English.

Quality control

The tool was pretested on 10 adolescent patients attending the ART clinic at Mbarara Municipal health center IV. This was done to check for the applicability, accuracy, and consistency of collected data before the commencement of the study. The information collected was analyzed and used to make the necessary corrections in the questions such as by rephrasing any biased or offensive questions.

Data analysis and presentation

Data checking and cleaning were done by the entire research team under the direction of the researcher. Data were checked for completeness and consistency. Data were entered into Microsoft Excel and analyzed using SPSS v.20. Descriptive statistics were presented as frequency tables, P-values, and Odds ratios.

Ethical consideration

The study approval was sought from the dean faculty of Clinical Medicine and dentistry KIU-Western campus whose letter of introduction was presented to the Director of Masaka regional referral hospital who then gave permission for the study and put authorizing remarks on the introductory letter. Participants were properly briefed by the interviewer on the nature of the study, its confidentiality, its importance to society, and the procedures for completing the questionnaire. Informed consent was obtained in all cases. Participant information like names and addresses were not recorded to maintain anonymity.

RESULTS

Individual Related Characteristics

I interviewed 103 participants on ART. Out of these, the majority (61.2%) were aged 16-20, 56.3% were male, 63.1% were out of school, 76.7% were married and 66.0% were Baganda. Only 32.0% had knowledge about adherence and 78.6% were urban dwellers. Regarding the guardians' level of education, a majority (42.7%) attained secondary education. A majority (39.8%) of the guardians were doing business as shown in table 1 below.

Table 1: Individual related characteristics

Variable	Frequency	Percentage (%)
Age		
13-15	40	38.8
16-20	63	61.2
Gender		
Male	58	56.3
Female	45	43.7
Education status		
In school	38	36.9
Out of school	65	63.1
Marital status		
Married	79	76.7
Single	24	23.3
Tribe		
Munyankole	19	18.4
Mukiga	13	12.6
Muganda	68	66.0
Others	03	2.9
Knowledge about Adherence		
Yes	33	32.0

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No	70	68.0
Residence		
Urban	81	78.6
Rural	22	21.4
Highest level of education of guardian		
No formal education	13	12.6
Primary	27	26.2
Secondary	44	42.7
Tertiary	19	18.4
Occupation of guardian		
Unemployed	23	22.3
Peasant	13	12.6
Formerly employed	16	15.5
Business	41	39.8
Others	10	9.7

Health system characteristics

Table 2 below presents the health system characteristics in the study. A majority (50.5%) of the study participants were staying a distance of 2-3km from the health facility, said they always find ARV drugs at the health facility whenever they are supposed to collect them (90.3%), and had health education about adherence (61.2%). 43.7% of the study participants reported a waiting time of 3-4 hours and 68.9% reported a good attitude of health workers.

Table 2: Health system characteristics

Variable	Frequency	Percentage (%)
Distance to the health facility(Km)		
<1	11	10.7
2-3	52	50.5
4-5	24	23.3
≥6	16	15.5
Do you always find ARV drugs at the health facility whenever you are supposed to collect them?		
Yes	93	90.3
No	10	9.7
Health education about adherence		
Yes	63	61.2
No	40	38.8
Waiting time at the health facility		
0-59mins	07	6.8
1-2hours	31	30.1
3-4hours	45	43.7
≥5hours	20	19.4
Attitude of health workers		
Good	71	68.9
Bad	32	31.1

Drug-related characteristics

In the study, 85.4% of the study participants always had their drugs when they were supposed to take them, 63.1% at times felt like not taking drugs because of pill burden and 23.3% reported having experienced side effects. Only 8.7% of the participants reported having a reminder for taking drugs as shown in the table below.

Table 3: Drug related characteristics

Variable	Frequency	Percentage (%)
Do you always have the drugs that you are supposed to take?		
Yes	88	85.4
No	15	14.6
Do you at times feel like not taking drugs because of pill burden?		
Yes	65	63.1
No	38	36.9
Have you ever experienced side effects?		
Yes	24	23.3
No	79	76.7
Do you have a reminder for taking drugs?		
Yes	09	8.7
No	94	91.3

Multivariate analysis of the individual-related factors associated with poor drug Adherence

The current study found an association between age, gender, knowledge about adherence, and residence with poor adherence as shown in the table below.

Table 4: Multivariate analysis of the individual-related factors associated with poor adherence to ART

Variable	N	Poor adherence		AOR(95% CI)	P-Value
		n	%		
Age					
13-15	40	16	40.0	1.63(0.45-1.91)	0.003
16-20	63	13	20.6	Reference	
Gender					
Male	58	20	34.5	1.70(0.05-2.34)	0.021
Female	45	09	20.0	Reference	
Education status					
In school	38	17	44.7	1.81(0.12-5.31)	0.614
Out of school	65	12	18.5	Reference	
Marital status					
Married	79	18	22.8	Reference	
Single	24	11	45.8	0.94(0.17-3.45)	0.079
Tribe					
Muganda	68	14	20.6	1.12(1.00-6.50)	
Mukiga	13	05	38.5	0.23(0.01-4.01)	0.734

Munyankole	19	10	52.6	1.50(0.91-2.84)	
Others	03	00	–	Reference	
Knowledge about Adherence					
Yes	33	05	15.2	Reference	
No	70	24	34.3	3.26(2.23-7.10)	0.036
Residence					
Urban	81	16	19.8	Reference	
Rural	22	13	59.1	2.71(1.34-10.23)	0.032
Highest level of education of guardian					
No formal education	13	07	53.8	1.20(0.55-1.67)	
Primary	27	11	40.7	0.93(0.68-7.39)	0.067
Secondary	44	09	20.5	0.30(0.004-0.64)	
Tertiary	19	02	10.5	Reference	
Occupation of guardian					
Formerly employed	16	01	6.3	Reference	
Peasant	13	04	30.8	0.91(0.48-16.77)	
Unemployed	23	13	56.5	0.17(0.03-15.80)	0.817
Business	41	10	24.4	0.88(0.14-12.35)	
Others	10	01	10.0	0.28(0.19-3.98)	

P-Value<0.05 was significant, CI-Confidence Interval, AOR-Adjusted Odds Ratio

Multivariate analysis of Health system factors associated with poor adherence to ART

In multivariate analysis, distance to the health facility, health education about adherence, waiting time at the health facility, and attitude of health workers were associated with poor drug adherence as illustrated below.

Table 5: Health system factors associated with poor adherence to ART

Variable	N	Poor adherence		AOR(95% CI)	P-Value
		N	%		
Distance to the health facility(Km)					
<1	11	00	–	Reference	
2-3	52	13	25.0	3.80(2.21-4.54)	0.006
4-5	24	09	37.5	5.63(3.00-11.10)	
≥6	16	07	43.8	7.12(1.59-15.33)	
Do you always find ARV drugs at the health facility whenever you are supposed to collect them?					
Yes	93	23	24.7	Reference	
No	10	06	60.0	1.73(0.78-3.45)	0.150
Health education about adherence					
Yes	63	12	19.0	Reference	
No	40	17	42.5	3.44(1.25-12.90)	0.005

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Waiting time at the health facility					
0-59mins	07	00	–	Reference	
1-2hours	31	05	16.1	0.17(0.03-3.47)	
3-4hours	45	15	33.3	3.58(1.19-9.50)	0.017
≥5hours	20	09	45.0	4.13(0.93-17.23)	
Attitude of health workers					
Good	71	15	21.1	Reference	
Bad	32	14	43.8	0.12(0.08-6.71)	0.025

P-Value<0.05 was significant, CI-Confidence Interval, AOR-Adjusted Odds Ratio

Multivariate analysis of drug-related factors associated with poor adherence. The present study revealed that pill burden, ever-experienced side effects, and having a reminder to take drugs were associated with poor adherence to drugs.

Table 6: Multivariate analysis of drug related factors associated poor ART adherence

Variable	N	Poor adherence	OR(95% CI)	P-Value
Do you always have the drugs that you are supposed to take?				
Yes	88	24(27.3)	Reference	
No	15	05(33.3)	1.54(0.14-5.10)	0.190
Do you at times feel like not taking drugs because of pill burden?				
Yes	65	22(33.8)	0.18(0.01-2.20)	0.041
No	38	07(18.4)	Reference	
Have you ever experienced side effects?				
Yes	24	11(45.8)	8.24(0.86-15.30)	0.001
No	79	18(22.8)	Reference	
Do you have a reminder for taking drugs?				
Yes	09	01(11.1)	Reference	
No	94	28(29.8)	6.19(5.00-20.06)	0.026

P-Value<0.05 was significant

DISCUSSION
Individual-related factors associated with Poor adherence to ART

There was an observed association between age, gender, knowledge about adherence, and residence with poor adherence. Higher odds of poor adherence were observed among participants aged 13-15 years in the study compared to older adolescents. This is consistent with Najjemba [28]. However, it is inconsistent with a study in Nepal that revealed that ART adherence decreased with Age [29]. This may be attributed to challenges associated with the implementation of transitioning process of care. According to the study, males were less likely to adhere compared to females. Similar findings were reported by a study in the Kyotera district where females were more adherent to medication than males [28]. This is also supported by a study in Cote d'Ivoire where poor adherence was more prevalent among males compared to females [30]. This could be due to gender roles assigned to males limiting them from accessing care on a regular basis. Respondents who had knowledge about adherence were more likely to adhere compared to those with no knowledge. This is congruent with the findings of a study in Ethiopia where participants who had knowledge were more likely to adhere to ART [31]. Conversely, knowledge was statistically insignificant according to a study in Zambia [32]. Being able to anticipate undesired effects when there

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is non-adherence improves adherence among the knowledgeable ones. This study showed that the likelihood of poor adherence was higher among rural dwellers compared to urban dwellers. This is in line with the findings of a study in Kyotera district, central Uganda where poor adherence to ART was more prevalent among the rural dwellers [28]. Additionally, a study in Ethiopia found that adolescents from rural areas were 1.9 times more likely to have poor adherence compared to those from urban [33]. This may be due to difficult access to health care services among rural dwellers.

Healthcare-related factors associated with Poor adherence to ART

The study established that distance to the health facility, health education about adherence, waiting time at the health facility, and the attitude of health workers was associated with poor drug adherence. A proportional increase in the occurrence of poor adherence was observed with an increase in distance to the health facility. Accordingly, similar findings were reported by a study in Nepal [29]. This could be due to transportation costs which limit those from distant areas from accessing health care. The present study further found that the occurrence of poor adherence was higher among those who had no health education about adherence. Similar findings were reported by Aciro [34] in Kampala. Health education improves understanding about the consequences of non-adherence therefore compelling patients to be adherent. Long waiting hours (≥5hours) increased the chance of poor adherence according to the study. This study revealed that the bad attitude of healthcare providers hindered adherence to ART. This is similar to a study by Mosha and colleagues [31]. The bad attitude of health care providers discourages patients from seeking health care.

Drug related factors associated with poor adherence to ART

The present study revealed that pill burden, over-experienced side effects, and having a reminder to take drugs were associated with poor adherence to drugs. Pill burden was significantly associated with poor adherence to ART. This is inconsistent with the findings of a study that found that pill burden on its own did not affect ART adherence [35]. The difference may be due to variations of participant's characteristics. There is fear of toxicity among those with a pill burden increasing the likelihood of non-adherence. Participants who reported having experienced side effects were less likely to adhere to medication compared to those who had never experienced side effects. This is in line with a study in South Africa by Bhat *et al.* [36]. Accordingly, Namoomba and colleagues [32] in their study found that experiencing side effects was associated with reduced adherence. Fear of side effects may lead to poor adherence to ART among these groups of people. Participants who had reminders for taking medication were more likely to adhere compared to those who had no reminders. This finding has in agreement with a study in Ethiopia which revealed that adolescents who did not use memory aids or other kinds of reminders were 2.4 times more likely to be non-adherent compared to those who used reminders [33]. This is also supported by a study in Nepal which found an improvement in the level of adherence with the use of reminders [29]. Forgetfulness is minimized among those who use reminders, therefore, improving adherence.

CONCLUSION

The level of poor adherence to ART among adolescents living with HIV is still high. Predictors of poor adherence include; age(13-15years), being male, having no knowledge about adherence, residing in rural areas, having no health education, residing far away from the health facility, long waiting hours, bad attitude of health workers, having pill burden, having no reminder to rake medication and previous experience of side effects.

RECOMMENDATION

Emphasis should be put on the decentralization of ART services to the level of health centers to increase accessibility to patients at their nearby health facilities. Strategies to reduce forgetting should be included in adherence counseling and health information dissemination, including memory aids such as pill boxes, printed schedules, and watch bells.

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