International Journal of Engineering & Scientific Research
Vol.11 Issue 10, October 2023
ISSN: 2347-6532 Impact Factor: 7.501
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gage as well as in Cabell's Directories of Publishing Opportunities, U.S.A

Determinants of Adherence To Antiretroviral Therapy Among Adolescents Aged 10-19 Years In Kisumu Central Sub-County, Kisumu, County

Olivia Ndede Adhiambo Oduol
Dr. Jane Owenga (Ph.D.)
Dr. Betty Mutere (Ph.D.)

Abstract

The study objectives were: to identify family social-cultural determinants of adherence to ART; to identify individual demographic determinants of adherence to ART and to assess health facility related determinants of adherence to ART among adolescents aged 10-19 years in Kisumu Central Sub-County, Kisumu County. The study was conducted in two high volume public health facilities on adolescents who are on HIV care and treatment for six months and above and have at least one viral load result. This study used Systematic random sampling on 254 adolescents and purposive sampling technique on 4 health care providers and 20 care givers. Data was collected using structured questionnaires, Key Informant Interviews and Focus Group Discussions. Chi-square findings showed that there is significant statistical relationship between adherence and family social cultural determinants, Individual demographic and Health facility related determinants. The study recommended that there was need for the family members to provide a friendly environment for the adolescents who are HIV positive and to encourage them to take their ART medication as scheduled. Also, the caregivers should assist the adolescents by reminding them on when to take their drugs so as to minimize the effects of the drug holiday among the adolescents. There is need for the health care providers to provide appropriate training for the caregivers so that they can be able to know how to handle and help the adolescents to take the ART medication. The facility should also ensure that they organize holiday health talk camps for the adolescents this will enhance the self-esteem of the adolescents and assist in the uptake of the ART medication

Keywords:

socio-cultural determinants;
individualdemographic determinants;
adherence to ART;
health facility;
adolescents;
HIV.

Author correspondence:

Olivia Ndede Adhiambo Oduol
Masters Degree in Public Health
Jaramogi Oginga Odinga University of Science and Technology, Kenya
Email:
oliviaoduol58@yahoo.com

1. Introduction

Globally there are 2.1 million adolescents living with HIV (ALHIV). The majority, 1.7 million live in sub-Saharan Africa. HIV is the second leading cause of adolescent morbidity and mortality worldwide and it's also the leading cause in Africa (Kim, 2017). Furthermore, in the same period that AIDS-related deaths decreased by 30% globally, AIDS related deaths amongst adolescents aged 10–19 years old grew by 50% (Kim, 2017). Additionally, among the 15 global high burden Countries in the prevalence of HIV among adolescents aged 10-19 years, Kenya is the third highest burdened according to (UNAID, 2016). There has been an increase in the provision of Ant-Retroviral Therapy across the world (WHO, 2009). Additionally, approximately 44% of People Living with HIV across the world are receiving ART (WHO, 2010). However, there are emphasis that successful ART is based on the client's adherent to the Anti-Retroviral Drugs and have a suppression rate of more than 95% although this could be limited in poverty-stricken settings (WHO,2009).

Adolescence is a period of mental, physical and emotional maturation wherein commonly individuals undergo behavioral experimentation, identity formation, risk taking and face difficult choices on romantic relationships, sexual behavior, alcohol and recreational drug use, besides young people often have poorly developed life skills, not being able to understand the environment in which they live and lack financial autonomy. They also have limited access to health facilities and are prone to sexual coercion and peer pressure (Kim, 2014).

In sub sub–Saharan Africa, it has been identified that iniquities, harmful gender norms and poverty as being factors contributing majorly towards young women HIV risk. There is need to establish the effectiveness of existing interventions, especially how human rights and gender can be looked into as part of HIV reduction strategy (Nyalapa, 2019).

In Kenya, it's been realized that nearly half of youths living with HIV do not get optimal adherence to HIV medication therefore, it has become a public concern in that such youths stand high chances of developing drug resistance due to incomplete viral suppression. There is need for a lot of support towards establishing and addressing the factors that hinder ARV's adherence before having more adolescents being put on second line treatment due to resistance on first line treatment (Manyeki, 2012).

According to the Kenya's ART guidelines, 2018, adherence is classified in three ways; undetectable viral load which means adequate adherence to ART. While low level viremia (LLV) is defined as having a detectable VL above the LDL (Lower than Detection Level) value but < 1000cp/ml and Suspected Treatment Failure (STF) is when a patient has a high VL ≥ 1000cp/ml after at least six months of using ART. The Low-Level Viremia (LLV) person is at a higher risk of progressing to treatment failure, if this continues despite the interventions put in place then they will require similar interventions with the ones for Suspected Treatment Failure (STF).

According to the Kenya HIV County profile 2016, Kisumu was ranked third at 9.5% of the PLHIV in Kenya. Having 22% of Adolescents and Young Adults living with HIV aged 15- 24 years. While children below 15 years living with HIV was at 6% with a general ART coverage of 89% and suppression rate of 61%.

A study conducted in Kisumu, Kenya suggested that HIV stigma intervention should be implemented in schools and clinics as well as provided to community and families so as to increase the chances of youth's access in HIV care and treatment. The study had implications for the role of family members, healthcare providers and educators in handling the needs of youth living with HIV, considering provision of safe confidential surrounding, reorganization of youth development needs and reduction of HIV stigma (Wolf, 2014).

Unfortunately, adherence to ART among children and adolescents is sub-optimal. A recent systematic review and meta-analysis that included over 50 studies globally found that only 62.3% of the adolescent and young adult (AYA) population was classified as adherent to therapy. This was assessed by self-report and plasma viral HIV RNA load (VL) levels (adherence at least 85% on self-report or undetectable blood plasma virus levels) (Kim, 2017).

According to the National AIDS Control Council (NACC) 2018 HIV estimates, nearly half of Kenyans living with HIV are found in Kisumu, Siaya, Homa Bay, and Migori Counties in western region and Nairobi County. Kenya has also adopted the joint UNAID, 2014 strategy of 95-95-95 which was meant to reduce the HIV prevalence by the year 2030 which focused on 95% of all people living with HIV should be aware of their status, 95% of those who are aware of their HIV-positive status should be on antiretroviral therapy (ART) (this is 81% of the overall population of people living with HIV in Kenya) and that 95% of those who are on ART should have viral load suppression (this is 73% of the overall population of people living with HIV in Kenya) yet the target has not been achieved.

Nationally, the prevalence of VLS among HIV positive adults was 71.6% (95% CI: 68.8%74.4%), while among children (ages 0–14 years) living with HIV VLS prevalence was markedly lower at 48.3%

(95% CI: 30.9%-65.7%) and findings of VLS among people living with HIV were regardless of knowledge of HIV status or use of ART (KENPHIA, 2018

1.2 Research Objectives

1. To identify family social-cultural determinants of adherence to ART among adolescents aged 10-19 years in Kisumu Central Sub-County, Kisumu County.
2. To identify individual demographic determinants of adherence to ART among adolescents aged 10-19 years in Kisumu Central Sub-County, Kisumu County.
3. To assess health facility related determinants of adherence to ART among adolescents aged 10-19 years in Kisumu Central Sub-County, Kisumu County.

1.3 Research Questions

1. What are the family social-cultural determinants of adherence to ART among adolescents aged 10-19 years in Kisumu Central Sub-County, Kisumu County?
2. What are the individual demographic determinants of adherence to ART among adolescents aged 10-19 years in Kisumu Central Sub-County, Kisumu County?
3. What are the health facility determinants of adherence to ART among adolescents aged 10-19 years in Kisumu Central Sub-County, Kisumu County?

2. Research Method

The study used descriptive cross sectional research design which will apply both qualitative and quantitative research method. The target population were 753 adolescents aged 10-19 and have been on care and treatment for HIV as well as care givers and health care providers. A Sample size of 254 respondents was determined by the use of Krejcie & Morgan table at 95% confidence level the degree of freedom is 1 and the chi-square is 3.841 as the margin of error stands at 0.05.

Systematic random sampling was used to select 254 adolescents. while purposive sampling as non-probability sampling technique was used to sample 4 health care providers and 20 care givers to participate. Data was collected through structured pre-tested interviewer-administered questionnaires. Key Informant Interviews guides was used to collect data from health care providers. Focus group discussions was used to collect data from the caregivers. The questionnaires were designed in English language. Validity and reliability of the instruments was checked through a pilot study in Ahero Sub-County Hospital in Nyando Sub- County. Test-retest technique was used to ensure reliability of data collection tool. The study obtained a reliability index of 0.78. Therefore, the researcher concluded that the research instruments was reliable.

Data was analyzed by the use of SPSS version 20. Tables, charts and bar graphs were used as well to interpret data descriptively. Chi square test was used to test the association between adherence and individual demographic determinants/family social-cultural and facility related determinants. Key informants Interviews and focus group discussions were analyzed using thematic analysis.

3. Results and Analysis

The researcher distributed 254 questionnaires to adolescent aged 10-19 years in Kisumu Central Sub County of which 223 (87.8%) questionnaires were completed and returned correctly, these yielded a response rate of 87%. This supports Creswell's (2009) argument that a response rate of more than 75.0 percent is sufficient as well as acceptable for the results to be generalized to the target group.

The study found out that all the adolescents 223 (100%) knew their HIV status. When the adolescents were asked to mentioned who talked to them about their HIV status, 168 (75.3%) mentioned caregiver, 7 (3.1%) stated grandparents, 40 (17.9%) mentioned doctor while 8 (3.6%) mentioned other relatives.

Also, 95 (42.6%) of the adolescents are taking first line regiment while 14 (18.4%) takes second line regimen. Only 1 (0.4%) of the adolescents were taking third line regimen. Also, the results revealed that about a third 86 (38.6%) of the adolescents did not know what type of regimen they were taking. Moreover, the finding of the study showed that 191 (85.7%) of the adolescents were being reminded by their family members to take drugs, while 31 (13.9%) refuted. Only one respondent neither said yes nor no on the family reminder to take drugs question. In addition, the results indicated that 211 (94.6%) of the adolescents agreed that they obtained psychological support from their family while 8 (3.6%) of them disagreed. This result is useful in ensuring that family members are involved in helping the adolescents' adherence to medication.

The research findings shows that 118 (52.9%) of the adolescents agreed that they have missed ART medication while 105 (47.1%) disagreed. The results indicate that more than half (52.9%) of the adolescents had missed ART medication this provide the need for investigating further on the determinants of adherence to ART medication among the adolescents. Also, that only 110 out of 118 of the adolescents who missed ART medication mentioned the period they have not taken medication. 50 (45.5%) of the adolescents missed ART medication for a day, 28 (25.5%) for a week, while 5 (4.5%) missed ART medication for a month. On the other hand, 27 (24.5%) of the adolescents who missed ART indicated other periods for missing ART

medication for instance three days, two weeks and three months. Further, the findings revealed that the adolescents who missed ART medication was due to no reminder 21(18.9%), 6 (5.4%) said they had one to remind them, 34 (30.6%) mentioned that they visited their relative/friends and forgot to carry their medicine while 11 (9.9%) said that they went to visit their relative/friends and they could not take their drugs as they are not aware of their status. Also 39 (35.1%) of the adolescents mentioned other reasons for missing ART medication was that they were very sick. Some adolescents mentioned that they had traveled to other places without the drugs and some highlighted that they went to house party and came back late in the night.

The findings showed that adolescents who complained that the drugs are too many were 7 (3.2%), the drugs are bitter and big in size 30 (13.8%), stigma 28 (12.9%) and no reminders 25 (11.5%). Also, some of the adolescents mentioned that they had inadequate food 9 (4.1%), no one to remind them to take drugs 10 (4.6%) while 108 (49.8%) of them mentioned other challenges not mentioned in the study such as it was hard to take drugs in a new environment since those people did not know their status, some visited their relatives and forgot to take their drugs with them. Also, 41 (18.4%) of the adolescents need availability of treatment buddy in order to take ART medication better every day and achieve viral suppression, 28 (12.6%) of them required availability of transport to facility while 88 (39.5%) of the adolescents required caregiver support. In addition, 26 (11.7%) of the adolescents mentioned that they required an environment with no stigma while 22 (9.9%) mentioned availability of alarm watches. Further, the results shows that 11 (4.9%) of the adolescents required teacher/matron support in order to take ART medication better every day and achieve viral suppression. Only 7 (3.1%) mentioned other supports that were not enlisted in the study.

The study result showed that 78 (35%) of the adolescents agreed that they had disclosed their HIV status while 145 (65%) of them did not. In addition, 35 (44.9%) of the adolescents had disclosed their status to their friends, 13 (16.7%) to the teachers, 18 (23.1 %) to their relatives while 2 (2.6%) had disclosed their HIV status to their siblings. Also 10 (12.8%) of the adolescents had disclosed their HIV status to other people not mentioned in the study. The findings revealed that 218 (97.8%) of the respondents indicated that their family know their HIV status while only 5 (2.2%) of adolescent mentioned that their family was not aware of their status. In addition, 138 (61.9%) of the adolescents attended post-test support group while 85 (38.1%) did not attend.

Further, majority (75%) of the health care providers indicated that not all of the adolescents who are on care have disclosed to their caregivers, this affects the adolescents who have been taken in by relatives for one reason or another and have no idea about the adolescent's HIV status. Only 25% of the health providers highlighted that adolescent on care had disclosed to the caregivers about their status. When the adolescents were asked the reasons for disclosing their HIV status to someone, they said for psychological support 49 (66.2%), treatment buddy 12 (16.2%) and other reasons 13 (17.6%) as indicated in table 15. Four of the adolescents who disclosed their status did not mention their reason to do so, that 31 (21.4%) of the adolescents did not disclose their status because of fear of rejection especially to their peers or boyfriends/girlfriends, 99 (68.3%) of them had fear of people knowing their status while 15 (10.3%) mentioned other reasons not included in the research such as; personal decision not to tell anyone about their status. Also, the adolescent stated they do not talk about health issues with their friends.

The study established that that 78 (35.0%) of the adolescents agreed that they had boy/girlfriends, 139 (62.3%) of them refuted. Just 6 (2.7%) of the adolescents did not respond to the question. Moreover, 33 (42.3%) of the respondents agreed that their boy/girlfriends know their HIV status. While, 45 (57.7%) rejected. Further, the findings showed that 54 (37.8%) of the adolescents will use protection at all times, 43 (30.1%) of them believe that they are LDL so the chances are very low. While, 46 (32.2%) stated other reasons that were not listed in the research.

The study reveals that 143 (64.1%) of the adolescents knew the kind of medication they were taking, while 80 (35.9%) of them did not know. The results revealed that 170 (76.2%) of the adolescents used alarm clock to ensure that they don't miss taking their medication while 28 (12.6%) of them were reminded by their caregivers. Also 25 (11.2%) of the adolescents mentioned other ways of ensuring that they don't miss taking their medication for instance; their parents and the use of alarm wrist watches. In addition, 203 (91.0%) of the adolescents mentioned that if they miss taking drugs, they will become sick and die while 5 (2.2%) of them stated that they did not know. Further, 15 (6.7%) of the adolescents mentioned other effects that will be caused by not taking their medication for instance the viral load will be high.

Addionally, the adolescents were asked whether they attended any facility post-test support group, and the results showed that 138 (61.9%) of the adolescents attended post-test support group while 85 (38.1%) did not attend. The findings showed that 72 (52.2%) of the adolescents attended the post-test support group once a month, 22 (15.9%) every weekend of the month, while 44 (31.9%) mentioned other periods such as twice a month, only once, and during school holidays among others. Further, the finding indicated that 9 (10.6%) of the adolescents did not attend the post-test support group because they were not comfortable being in a group, 18 (21.2%) of them felt that there was conflict with their programme such as school, church etc., 4 (4.7%) of the adolescents mentioned that their caregivers won't allow them while 15 (17.6%) of them

mentioned that they won't attend the group due to lack of transport to the facility while 39 (45.9%) of the adolescents highlighted other reasons for not attending the facility post-test support group such as they don't know the meeting days.

The results showed that 17 (7.6%) of the adolescents visited the clinic last one week ago, 28 (12.6%) of them visited the clinic 2-4 weeks ago, 53 (23.8%) of the adolescents visited clinic one month ago while 19 (8.5%) of them visited the clinic two months ago. The majority 101 (45.3%) of the adolescents visited the clinic over 3 months ago while 5 (2.2%) of them visited the clinic other times. Also, the findings indicated that 203 (91%) of the adolescents felt that healthcare providers were friendly during their last facility visits while 14 (6.3%) of them mentioned that they were served very fast. Only 4 (1.8%) of the adolescents mentioned that it took time to get served at the facility while 2 (0.9%) of them stated other experience at the facility.

Moreover, the results showed that 112 (50.2%) of the adolescents were informed of their lab results while 111 (49.8%) of them were not informed. Further, findings showed that 167 (74.9%) of the adolescents had 0-400cp/ml, 28 (12.6%) of them had 401-999cp/ml while 13 (5.8 %) had >1000cp/ml. Just 14 (6.3%) were not sure of their copies. Viral suppression means that the adolescents are 95% virally suppressed. This means that any viral load copies below 1000cp/ml shows viral suppression. However, this found out that only 195 (87.4%) of the adolescents had suppressed which is below the optimum level of suppression required. In addition, study results revealed that 146 (65.5%) of the adolescents highlighted that the health care provider told them that their viral load was good and they should continue to take their medication while 13 (5.8%) of the adolescents said they were told that their viral load was not good and they should take their medication well. On the other hand, 8 (3.6%) and 7 (3.1%) of the adolescent stated that they were told by the health care provider that the viral load result was not good and was bad respectively. About 40 (17.9%) of the adolescents said that they were told other information not in the research.

The finding revealed that 211 (94.6%) were positive while 12 (5.4%) refused. The 7 (3.1%) of the adolescents couldn't tell the health care provider about their failure to take medications or having trouble taking them because they felt like the health care provider might quarrel. While, 53 (23.8%) of them mentioned other reasons such as; them not being used to any of the health care providers available. Also, 2 (0.9%) of the adolescent couldn't tell the health care provider because they might shout at them and people will know about them not taking their drugs. Majority of 161 (72.2%) of the adolescent refused to disclose their reasons for not telling the health care provider about their failure to take medications or having trouble with them. Moreover, the results revealed that 214 (96%) of the adolescents believed that health care provider gave them enough support at the facility while 9 (4%) refuted the statement. Further, most (75%) of the health care providers mentioned that they had a means of getting feedback from the adolescents towards the services they give them at the health care facilities while only 25% denied getting the feedback from the adolescents. The feedback methods that were used by most of the health care providers were verbal, through the adolescent support groups, through adolescent WhatsApp groups and by storying with adolescents during their TCA dates. Further, there were recommendations for suggestion boxes to be placed at the clinic for the adolescents to give their feedback anonymously.

The finding revealed that 212 (95.1%) of the adolescents agreed that they usually go for drug refill as scheduled by their health care provider while 11 (4.9%) did not. Further, majority (72.7%) mentioned that the facility was far off. Also 2 (18.2%) of the adolescents mentioned that they were told to go back with their caregivers but this was not possible. Some 1 (9.1%) of the adolescents felt that inconvenient clinic operational hours were the cause of failing to go for the drug refill as scheduled. Also, 50 (52.6%) of the adolescents highlighted that they did not have transport to go tothe facility, 6 (6.3%) of them mentioned the facility providers were not friendly while 39 (41.1%) of the adolescents stated other reasons for not going to clinic.

The finding revealed that 199 school going adolescents, 85 (42.7%) of the adolescents agreed that they usually take their medication on time while at school while 114 (57.3%) of them disagreed. The adolescents were tasked to mention whom they felt comfortable discussing their ART medication with when in school. The findings in table 39 reveals that 33 (20%) of the adolescents are more comfortable to share their ART medication with their teachers while in school, 16 (9.7%) of them could discuss with the friends who are HIV positive while 10 (6.1%) of the adolescents will discuss their ART medication with friends who are HIV negative. Also 11 (6.7%) of the adolescents will discuss with the matron about the ART medication. Majority of the adolescents mentioned that they will not discuss the ART medication with anyone in school while 9 (5.5%) of them said they will be comfortable to discuss the ART medication with others not listed in the research.

The study result showed that the challenge they face was that they had no time to take drugs while in school 3 (2.8%), 34 (31.8%) of them had fear that someone may know their HIV status while 3 (2.8%) of the adolescents had no one to remind them when to take medication. Also, the results revealed that 5 (4.7%) of the adolescents had fears that checkup in school might expose their medicine and people may know their

status. However, 46 (43%) were confident that they had no challenge. About 14% of the respondents mentioned other challenges that are not listed in the study. Further, the findings showed that 20 (19.8%) of the adolescents required to be given permission to take their medication whenever necessary, while 17 (16.8%) of them needed peers to support them. Further, 20 (19.8%) of the adolescents required matrons to support them, and 19 (18.8%) of them needed to be provided with a pill box. About 10 (9.9%) of the adolescents mentioned that they require school to have stigma and discrimination sessions. Only 14 (14.9%) of the adolescents highlighted other support in order to adhere to medication while in school.

3.1 Chi Square Analysis

Chi square test was used to test the association between adherence and family social-cultural determinants, individual demographic determinants and facility related determinants. The findings were as follows:

3.1.1 Chi-Square Tests for Adherence and family social-cultural determinants.

The finding of the chi-square test in Table 1 showed that there was significant statistical relationship between adherence and family social cultural determinants (sig. value < .05); P-value=0.00. Degree of freedom is 1

Table 1: Chi-Square Tests for Adherence and family social-cultural determinants.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.141a	1	.000
Likelihood Ratio	8.316	1	.043
Linear-by-Linear Association	16.059	1	.000
N of Valid Cases	223		
1 cells (25.0%) have expected count less than 5. The minimum expected count is .44. Computed only for a 2x2 table			

3.1.2 Chi-Square Tests for Adherence and Individual related determinants.

Chi-square test in Table 2 showed that the Chi Square Value is 16.131 and p value is 0.000. Since the P value was less 0.05, there was significant statistical relationship between the adherence and individual related determinants.

Table 2: Chi-Square Tests for Adherence and Individual related determinants.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.131a	1	.000
Likelihood Ratio	7.913	1	.005
Linear-by-Linear Association	16.059	1	.000
N of Valid Cases	223		
1 cells (25.0%) have expected count less than 5. The minimum expected count is .44. Computer only for a 2x2 table			

3.1.3 Chi-Square Tests for Adherence and Facility related determinants.

The finding of the chi-square test in table 44 showed that the Chi Square value was 16.114 and p value was 0.000. Since the P value was less than 0.05, the results meant that there was significant statistical relationship between the adherence and facility related determinants.

Table 3: Chi-Square Tests for Adherence and Facility related determinants.

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.114a	1	.000
Likelihood Ratio	7.910	1	.015
Linear-by-Linear Association	15.048	1	.000
N of Valid Cases	223		
a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is .44.			
b. Computed only for a 2x2 table			

4. Conclusion

Based on the findings above, the study concluded that family determinants contribute to the ART adherence among the adolescents. Secondly, the study concluded that individual determinants affected the ART medication adherence among the adolescents. Finally, the study concluded that Health facility determinants had a significant contribution towards the ART medication adherence by the adolescents aged 10-19 years

References

[1]. Arrive, E., Dicko, F., Amghar, H., Aka, A. E., Dior, H., Bouah, B., Traore, M., Ogbo, P., Dago-Akribi, H. A., Eboua, T. K. F., Kouakou, K., Sy, H. S., Alioum, A., Dabis, F., Ekouevi, D. K., Lero, V.; For the Pediatric 1eDEA, West Africa Working Group (2012). *HIV Status Disclosure and Retention in Care in HIV-Infected Adolescents on Antiretroviral Therapy (ART) in West Africa.* From http://www.ncbi.nlm.nih.gov/pubmed/22457782.

[2]. Asare, M., & Sharma, M. (2012). Role of Health belief Model on sexual communication among African Immagrants. *American Journal of Health Studies*, 27(2), 97.

[3]. Bakanda, C., Birungi, J., Mwesigwa, R., Nachega, J. B, Chan, K., Palmer, A., Ford, N., Mills, E. J., (2011). *Survival of HIV-Infected Adolescents on Antiretroviral Therapy In Uganda: Findings From A Nationally Representative Cohort In Uganda*.

[4]. Campbell T., (1997). *Reasons for HIV Testing in Heterosexual Sample. The Role Played Factors and Constructs from the Health Belief Model.*

[5]. Creswell, J.W. (2012) *Research Design: Qualitative, Quantitative and Mixed Methods Approaches:* Third Edition Thousand Oaks: Sage Publications.

[6]. Irunde, H., Temu, F., Maridadi, J., Nsimba, S. and Comoro, C. (2006). A study on antiretroviral adherence in Tanzania: a pre-intervention perspective, 2006. *Geneva: World Health Organization*. 169-243.

[7]. Karanja S. W., (2013). *Factors influencing adherence to antiretroviral medications among patients living with HIV in Kenya.*

[8]. KENPHIA (2018). PRELIMINARY-REPORT-2020-HR3-final http://www.nascop.

[9]. Kim, S. H., Gerver, S. M., Fidler, S., & Ward, H. (2014). Adherence to antiretroviral therapy in adolescents living with HIV: systematic review and meta-analysis. *AIDS (London, England),* 28(13), 1945.

[10]. Kim, M. H., Mazenga, A. C., Yu, X., Ahmed, S., Paul, M. E., Kazembe, P. N., & Abrams, E. J. (2017). High self-reported non-adherence to antiretroviral therapy amongst adolescents living with HIV in Malawi: barriers and associated factors. *Journal of the International AIDS Society*, 20(1), 21437.

[11]. Kimeli, C. M., Cheruiyot, E., Waweru, J., Sumukwo, R., Nalama, N., Owido, A., & Kimarua, M. (2020). An assessment of challenges influencing access to comprehensive HIV care among Kenya. *American Journal of Health, Medicine and Nursing Practice*, 5(2), 13-47

[12]. Ketchaji, A., Ngouakam, H., Assah, F., Ndjalla, A., Monebenimp, F., & Marcelin, N. N. (2019). A Qualitative Assessment of the Determinants of Adherence to Antiretroviral Therapy among Adolescents living with HIV in the Centre Region of Cameroon. *J Environ Sci*, 3(3), 326-346.

[13]. King'ori, B. M. (2020). *Factors associated with Viral Non-Suppression among HIV positive Adolescents in Chulaimbo Hospital, Kisumu County, Kenya, 2018* (Doctoral dissertation, Moi University).

[14]. Li, H., Marley, G., Ma, W., Wei, C., Lackey, M., Ma, Q., ... & Tucker, J. D. (2017). The role of ARV associated adverse drug reactions in influencing adherence among HIV- infected individuals: a systematic review and qualitative meta-synthesis. *AIDS and Behavior*, 21(2), 341-351.

[15]. Mayeye, B. F., Ter Goon, D., & Yako, E. M. (2019). An Exploratory Study of the Determinants of Adherence to Antiretroviral Therapy by Adolescents and Youths in the Eastern Cape, South Africa. *Global Journal of Health Science*, 11(11).

[16]. Manyeki, R. W. (2012). *The influence of psychosocial factors on HIV antiretroviral drugs adherence among young people in Nakuru Central District, Kenya* (Doctoral dissertation, University of Nairobi, Kenya).

[17]. MacKenzie, R. K., van Lettow, M., Gondwe, C., Nyirongo, J., Singano, V., Banda, V., & Hrapcak, S. (2017). Greater retention in care among adolescents on antiretroviral treatment accessing "Teen Club" an adolescent-centred differentiated care model compared with standard of care: a nested case–control study at a tertiary referral hospital in Malawi. *Journal of the International AIDS Society*, 20(3), e25028.

[18]. Mburu, M. (2019*). Early diagnosis in infants born to HIV-positive adolescent compared to adult mothers in Kisumu, Kenya* (Doctoral dissertation).

[19]. Mugenda O. M. & Mugenda G.A. (2008). *Social Science Research Nairobi.* ARTS press.

[20]. Mutwa PR, Van Nuil JI, Asiimwe-Kateera B, Kestelyn E, Vyankandondera J, et al., (2013). Living Situation Affects Adherence to Combination Antiretroviral Therapy in HIV-Infected Adolescents in Rwanda: A Qualitative Study. *PLos ONE 8(4):* e60073. Doi: 10.1371/journal.pone.0060073.

[21]. Naomi, W., Peter, G., Mbuthia, J., Joshua, M., & Ndwiga, T. (2018). Determinants of Adherence to Antiretroviral Among HIV Positive Adolescents at Comprehensive Care Clinic, Gertrude's Children Hospital, Nairobi, Kenya. *American Journal of Nursing*, 7(1), 23-30.

[22]. National Aids and STIs Control Programme (NASCOP), (2009) & 2007 Kenya AIDS Indicator Survey (KAIS) Final Report. Nairobi: National AIDS/STD Control Programme.

[23]. Nyalapa, M. W., & Conn, C. (2019). HIV/AIDS among young women in Malawi: A review of risk factors and Interventions. Pacific Health, 2.

[24]. Ndungu, A., Gakuu, C., & Kidombo, H. (2019). *Influence Of Behavioral Interventions On Performance Of Hiv Prevention Projects Among Adolescents In Kisumu County, Kenya.*

[25]. Okoboi, S., Ssali, L., Yansaneh, A. I., Bakanda, C., Birungi, J., Nantume, S., & Kalibala, S. (2016). Factors associated with long-term antiretroviral therapy attrition among adolescents in rural Uganda: a retrospective study. *Journal of the International AIDS Society*, 19, 20841.

[26]. Suryana, K., Suharsono, H., & Antara, I. G. P. J. (2019). Factors Associated With Adherence To Anti-Retroviral Therapy Among People Living With HIV/AIDS At Wangaya Hospital In Denpasar, Bali, Indonesia: A Cross-Sectional Study. *HIV/AIDS (Auckland, NZ)*, 11, 307.

[27]. Sarna A., Pujari S., Sengar A., Garg R., Gupta I. and Van Dam J. (2008). Adherence to antiretroviral therapy and its determinants amongst HIV patients in India. *Indian Journal Medical Research*, 127, pp 28-36.

[28]. Sharada P. Wasti1, Edwin van Teijlingen2, Padam Simkhada1, Julian Randall3, Susan Baxter1, Pamela Kirkpatrick4 and Vijay S. GC5 (2012). Factors influencing adherence to antiretroviral treatment in Asian developing countries: *A systematic review volume* 17 no 1 pp 71–81

[29]. Sithole Z, Elizabeth Mbizvo1, Prosper Chonzi2, More Mungati3, Tsitsi Patience Juru1*, Gerald Shambira1, Notion Tafara Gombe1 and Mufuta Tshimanga1 (2017). *Virological failure among adolescents on ART, Harare City, - a case-control study.*

[30]. UNAIDS. UNAIDS 2016 Estimates. (2016). [cited 2016 August 30]. Available from: http://aidsinfo.unaids.org/.

[31]. Wolf, H. T., Halpern-Felsher, B. L., Bukusi, E. A., Agot, K. E., Cohen, C. R., & Auerswald, C. L. (2014). "It is all about the fear of being discriminated [against]… the person suffering from HIV will not be accepted": a qualitative study exploring the reasons for loss to follow-up among HIV-positive youth in Kisumu, Kenya. *BMC public health*, 14(1), 1154.

[32]. World Health Organization (WHO), (2010). *Towards Universal Access. Scaling Up Priority HIV/AIDS Interventions in the Health Sector: Progress Report by WHO*; Geneva.

[33]. Zvanaka, S., Mbizvo, E., Chonzi, P., Mungati, M., Juru, P., Shambira, G., Gombe, T., Tshimanga, M. (2017). Virological failure among adolescents on ART, Harare City, Case control study. *BMC Infectious Diseases* 18:469.