Global Journal of Medicine & Public Health

Relationship between risky sexual behaviour and adherence to ART among adolescents living with perinatally acquired HIV on long-term antiretroviral treatment in Mbombela sub-district, South Africa

*Patricia Nkosi[1], Sphiwe Madiba[2], Mathildah Mokgatle[3], Muhammad Hoque[4]**

ABSTRACT

Background

The prevalence of non-adherence to ART medication is on the rise and resulting in high mortality and morbidity among older adolescents with perinatal acquired HIV. Furthermore, their engagement in health risk behaviours such as smoking, alcohol and other drug abuse, sexual risk behaviour's resulting in unplanned pregnancy. Their health risk behaviours are associated with poor or non-adherence to medication resulting in viral replication.

Purpose

The purpose of the study is to determine the relationship between risky sexual behaviours and adherence to ART among adolescents with perinatal acquired HIV at Mbombela sub-district in Mpumalanga province, South Africa.

Methodology

A quantitative descriptive cross-sectional study design was used to obtain data on adherence and risky behaviours among adolescents with perinatal acquired HIV. The study population consists of adolescents with perinatal acquired HIV who are on ART for more than 12 months and came for their follow up visit.

Results

The prevalence of adherence to ART was found to be 73.3%. Younger adolescent (<=17 years) exhibited lower odds [OR=0.4] of adhering to ART medication compared to adolescents aged at least 18 years. Adolescents with a steady partner demonstrated reduced odds [OR=0.1] of adhering to ART medication, as did those with a casual partner [OR=0.2], compared to adolescents without a current partner. Adolescents with fathers that were still alive demonstrated increased odds [OR=6.8] of adhering to their prescribed treatment (P=0.01). Adolescents who did not consume alcohol exhibited notably higher odds [OR=7.1] of adhering to their medication.

Conclusion

The study indicated that adherence and risky behaviours remains a challenge on the treatment outcomes of adolescents with perinatal acquired HIV as reported. The findings of this study can assist public health practice by providing baseline insight into the association of adherence and risky behaviours among adolescents with perinatal acquired HIV.

Keywords: Steady partner, father alive, alcohol consumption, challenges

GJMEDPH 2024; Vol. 13, issue 1 | OPEN ACCESS

4*Corresponding author Muhammad Hoque,Department of Public Health,Sefako Makagtho Health Sciences University,Pretoria, South Africa **1**.Patricia Nkosi , Postgraduate student,Department of Public Health,Sefako Makagtho Health Sciences University,Pretoria, South Africa; 2.Sphiwe Madiba,Research Professor,University of Limpopo; 3.Mathildah Mokgatle, Department of Public Health, Sefako Makagtho Health Sciences University,Pretoria, South Africa.

.

Conflict of Interest—none | Funding—none

© 2024 The Authors | Open Access article under CC BY-NC-ND 4.0

INTRODUCTION

The World Health Organization (WHO) defines an adolescent as any person between the ages of 10 and 19 years. Adolescent is marked by rapid physical development, intellectual and emotional growth. It is a period in which bodies develop in size and strength and reproductive capability. An adolescents' social world expands at this stage beyond their families to includes peers, celebrities; and role models.[1] Due to their social expansion; they are more influenced by peer pressure, leading to their involvement in health risk behaviours such a smoking, alcohol intake and sexually risky behaviours.

An estimated of 2.1 million adolescents aged 10-19 years are living with HIV in the world.[2] About 1.5 million adolescents aged 10-19 years are living with HIV and are in the Sub-Saharan Africa.[3] Beyond their HIV status there are multiple health risk behaviours among adolescents from a rural setting in sub-Saharan Africa.[4] Several studies in sub-Saharan Africa indicated that adolescents with perinatally acquired HIV are faced with decreased medication adherence, mental health problems, and early sexual debut accompanied by unplanned pregnancy like their HIV negative peers. Furthermore, most of them are sexually active with minimal/ inconsistent condom use, and fear of disclosing their status to their partners due to a fear of rejection. On the other hand, their substance abuse predisposes them to other risky behaviours.[5]

Adolescents with PHIV are less likely to attain viral suppression due to their poor adherence to ART medication.[6,7] The main goal of ART is to obtain and maintain an undetectable viral load, because a failure to achieve and sustain viral load suppression poses an increased risk of HIV transmission among adolescents.[8] There is consensus among researchers from many settings in sub-Saharan Africa that adherence to ART is central to the survival and improvement of the quality of life of children and adolescents with PHIV.[9] Sub-optimal adherence to ART leads to disease progression, treatment failure and drug resistance, and increases the risk of the onward transmission of drug-resistant strains to sexual partners.[10] Virological suppression requires optimal adherence to ART, and this means that the adolescent must take the correct dose consistently and correctly.[6]

There are multiple factors that negatively affect adherence to ART among children and adolescents with PHIV and disclosure plays a significant role in their care (Madiba, 2016).[12] Delayed disclosure on their HIV status by caregivers has been identified as a key factor in children adhering to ART. Delayed or non-disclosure increases the risk of children refusing to take medication, resulting in poor adherence to ART and an increased risk of treatment failure.[11-13]

Disclosure is associated with improved clinical outcomes, better coping skills, fewer psychological problems, improved adherence, and safer sexual practices. It also provides answers to an adolescent's questions and fulfils the right of the adolescent to know her status.[14] In another study it was reported that adolescents perceived disclosure positively and as a result they found their treatment meaningful and adhered to the treatment.[15]Research conducted globally has shown that adolescents with PHIV engage in various health risk behaviours.[4] The main forms of health risk behaviours include risky sexual behaviours contributing to unintended pregnancy and sexually transmitted diseases, alcohol abuse, tobacco and drug use, unhealthy dietary habits, inadequate physical activity, and behaviours that contributes to unintentional injury or violence. Various studies conducted in developing countries including some in sub-Saharan Africa have found that adolescents with PHIV are like their HIV-negative peer in that, they engage in substance abuse, risky sexual behaviours and inconsistent condom use. Of concern is that adolescents with PHIV are engaging in substance use and risky sexual behaviours at a young age.[16]

There are significant data showing that optimal adherence to ART among adolescents on long-term treatment is challenging and is affected by various factors.[17,18] For adolescents in poor-resource and rural settings, poor housing, and lack of transport money to access the clinic, and the absence of parental or social support are barriers to optimal adherence.[19] Furthermore, an increasing number of adolescents are orphans and lacks parental support to adhere to ART.[17] The unique behavioral characteristics and health risk behaviours of adolescents such as alcohol consumption, drug abuse and risky sexual behaviours have also been identified as barriers to adherence to

ISSN# 2277-9604

ART.[19] Moreover, the aspiration to be acceptable to peers during adolescence greatly affects treatment adherence among adolescents with PHIV.[20] The researcher has observed that adolescents with PHIV who access services in the community health facility where she is based present with similar health risk behaviours. The clinical data show unsuppressed viral loads, poor adherence to treatment and clinic appointments, sexually transmitted infections, and unplanned pregnancies among the adolescents.

Although many studies have been done on adherence to ART and associated factors among adolescents, few studies have been conducted on the association between health risk behaviours and adherence among adolescents with PHIV in South Africa. Poor adherence to ART among adolescents with PHIV underscores the urgent need to identify risk factors that contribute to poor adherence by adolescents with PHIV, to improve their viral load suppression rates. Establishing a link between disclosure and adherence will inform the counselling provided to adolescents in the facilities. Furthermore, an understanding of poor adherence will inform the development of interventions to improve the health outcomes of adolescents with PHIV. The aim of the study is to determine the prevalence of adherence to ART and the association between risky behaviours and adherence among adolescents with perinatally acquired HIV in Mbombela sub-district, Mpumalanga Province.

MATERIAL AND METHODS

A quantitative, descriptive, cross-sectional study design was used to obtain data on adherence and risky behaviours among adolescents, using a researcher administered questionnaires. A quantitative approach was used because the study focuses on numeric data, based on larger samples that represent the population determine relationships between the outcome variable and independent variables.

The study was conducted in community health centres (CHC's) located in Mbombela Sub-District, in Mpumalanga province. Mbombela Sub-District is in the City of Mbombela, previously known as Nelspruit, in Ehlanzeni District. Mbombela is an urban area and capital city of Mpumalanga province. The dominant languages in Mbombela includes SiSwati, IsiZulu, Xitsonga, IsiNdebele, and Sepedi. The sub-district has thirty-two health facilities, of which six are 24-hours CHCs and twenty-six are 8-hours clinics.

The study was conducted in four CHCs located in a semi urban and urban areas, about 30-50 kilometres from Nelspruit. Two of the CHCs are in urban areas and the other two in semi-urban areas. Estimated data reported by Statistics South Africa showed that the CHCs serve a population of 240 408.[21] The CHCs were selected purposely because they had a high volume of adolescents on life-long ART at the time of the conceptualization of the study. Women are currently offered the first regimen, which is Tenofovir, Lamivudine and Dolutegravir.The services provided by the facilities includes immunization (EPI), the integrated management of childhood illnesses (IMCI), the prevention of the mother-to-child transmission of HIV (PMTCT), antenatal care (ANC), the termination of pregnancy (TOP), sexual reproductive health (SRH), the treatment of minor ailments, trauma and emergency care, chronic care, and labour and delivery. In addition, the facilities provide integrated chronic health services including HIV care for children, adolescents, and adults. The HIV care includes HIV testing services, PMTCT, PREP and HIV management for adults and children.

The study population consisted of adolescents with PHIV on ART who came to the facilities for their follow up visits. Adolescents were eligible to participate in the study if they were aged from 14-20 years, had been on ART for more than 12 months, and provided informed consent or assent. There were approximately 750 adolescents 14-20 years' old who attended the four facilities during the period of the data collection. A convenient sampling method was used because it relies on data collection from members of a population who are conveniently available to participate and willing to participate in at study. The researcher opted for convenient sampling because the participants would be readily available at a given time and the numbers of those at the facilities at a given time did not allow for random sampling.[22] All the adolescents who came for their medication refills and met the inclusion criteria on the day of data collection were selected. Rao soft statistical software was used to determine the sample size required for the study. Using an estimated population size of 3000, with a confidence level of 95% and a margin of

ISSN# 2277-9604

error of 5%, the minimum sample size was 344. A 12% buffer (40 participants) was added to the minimum sample to accommodate spoiled and incomplete questionnaires and minimize selection bias, resulting in a final sample size of 384.

The study included all adolescents with PHIV aged between 14 and-20 years who had been on ART for more than 12 months. Males and females' adolescents were eligible to participate whether they were aware of their HIV status or not, if they consented to participate by signing an informed consent or assent document, or their caregivers provided a signed informed consent. Adolescents below the age of 18 years who were not accompanied by adults were not interviewed but an informed consent form was sent to the caregiver to sign, and an appointment was set to interview the participant on the next visit. If the caregiver had signed the assent form for the next visit, then the adolescent was interviewed. Adolescents between the age of 10 and 13 years, those who had been on ART for fewer than 12 months, those whose caregivers had not provided informed consent, and those who were critically ill were excluded from the study.

The recruitment of study participants started after ethical clearance had been obtained from Sefako Makgatho Health Sciences University Research and Ethics al Committee (SMUREC). This was followed by obtaining permission to conduct the study from the Mpumalanga Department of Health. Permission to visit the facilities was obtained from the Mbombela Sub-District Primary Health Care Manager. An appointment was made with the facility managers of the selected CHCs for the researcher to introduce herself and the research assistant and explain the objectives of the study and the proposed plan for data collection. Copies of all the ethical clearance certificates were issued to the facility managers.

The recruitment of the participants took place in the observation room where the nurse would give the files of all the adolescents who had acquired HIV perinatally and were on ART to the researcher and research assistant to select those who qualified to be included in the study. These would be the files of all the adolescents on ART from 14 to 20 years old. After receiving the files, the researcher would select those who had started ART before the age of 10 years, after ascertaining with the adolescent or the caregiver if she/he had been perinatally infected or not. The files of those who had been behaviourally infected would be taken back to the observation room. The perinatally infected were taken into the private room where the purpose of the study was explained to them, and informed consent was obtained from those 18 years old and above. For those who were below 18 years old, the purpose of the study was explained to both the caregiver and the adolescent. This was followed by obtaining assent from the participant Unaccompanied adolescents who had to obtain consent from caregivers were interviewed only on their next visit, and only if the informed consent form had been signed by the caregiver. To avoid repeat interviews of participants, the consent and assent forms of those who had been interviewed were recorded in a register specifically created by the facility. The facilities were visited once a week which is on specific days scheduled by the researcher. The researcher also visited one facility on Saturdays, when it runs support groups for adolescents on HAART.

Data were collected from 01 September 2019 until 31 March 2021. Data were collected using a researcher administered questionnaires with closed-ended questions. The questionnaire was designed by the researcher with the assistance of her supervisor and was translated from English to SiSwati, which is the most common language in Mbombela. The tool elicited demographic information and information about family structure. It asked, disclosure questions, sex related questions, and treatment related questions. CD4 count data and viral load counts were obtained from the participants' medical records.

To protect those who had not been disclosed to, disclosure related questions were printed on a separate page and asked from only those who had been disclosed to. The participants were asked if they had been told what the pills they were taking were for, to establish if the participant knows his/her status. If the answer was positive, then they would immediately be asked what exactly they had been told. It would be possible to determine from both responses if she/he had been disclosed to. The disclosure questionnaires would follow if the participant knew his/her status. The information pamphlet/ leaflet was given to the eligible

participants before signing a consent/ assent form. The information pamphlet states clearly the intentions of the study and allows the participant to ask questions concerning the study.

The questionnaire was administered in a private room with one participant at a time to allow her/him to feel free to answer the questions. Written consent or assent was obtained before the tool was administered. The questionnaires were completed after obtaining informed consent or assent form from the adolescents and/or caregiver. The consent and assent forms and questionnaires were administered in either SiSwati or English depending on the participant's preference. Most preferred SiSwati, while a few preferred English because SiSwati was not their mother tongue.

The data collection was conducted by the researcher, assisted by two research assistants who understood both SiSwati and English. The research assistants had been trained on the purpose of the study, how to administer informed consent or assent forms, on confidentiality, and on how to administer the questionnaires and record the blood results. The researcher and the assistant occupied different consulting rooms administering the questionnaire. To ensure the privacy of the participants, they would enter the consultation rooms one at a time. It took about 15 to 20 minutes to administer the questionnaire. Data were collected in the mornings while the participants were awaiting to be seen by a professional nurse because participants are being not willing to wait longer after their consultations and receiving their medication refills.

Data was collected concurrently from all the facilities until the required sample size had been reached. Data collection continued for 6-9 months for various reasons. Firstly, the researcher and one research assistant were not available for field work all the time due to work commitments. The period of data collection was also affected by the fact that adolescents under 18 years of age came to the clinic unaccompanied by adults. This delayed the data collection because the caregivers had to provide written informed consent on the follow up visit before the adolescent could be included in the study. Secondly, all the facilities offer adolescent clinics once a week, which meant that recruitment could be done only once a week. Moreover, some of the adolescents had been behaviourally infected; and had to be excluded from the study, which made recruitment strenuous. In addition, data collection was interrupted due to the COVID-19 lockdowns from April 2020 to March 2021. After the lockdown, eighty-three questionnaires were administered at two facilities. All COVID-19 protocols were observed to prevent the transmission of the COVID-19 virus to the participants during the data collection.

The researcher, the research assistants and the participants wore masks and always maintained the required social distance during the administration of the questionnaire. A pilot study was done with forty adolescents with PHIV prior to the actual study, during July 2019, and data collection commenced shortly after that. Forty adolescents were piloted instead of thirty-eight to accommodate spoiled and incomplete questionnaires. The pilot was conducted in one of the CHC's in the sub-district. The purpose of the piloting was to pre-test the tool as well as to check for any logistical challenges that might arise during the data collection process. The tool was reviewed after piloting and the results of the pilot study were not being included in the main study. Disclosure questions were also added on a separate page for those adolescents who knew their status. Participants in the pilot study were not included in the main study.

Ethical standards were maintained throughout the study by ensuring that ethical clearance was obtained from Sefako Makgatho Health Science University Research Ethics Committee (SMUREC) before conducting the study and research permission was obtained from Mpumalanga Provincial Department of Health and from the management of Mbombela Sub-District to access the facilities. Written informed consent was obtained from adolescents above the age of 18 years and assent from those younger than 18 years. Signed informed consent was obtained from the caregivers of adolescents below 18 years of age after the purpose of the study had been explained to them and those caring for them. Voluntary participation and the right to withdraw from the study at any time without compromising the services received from the facility were emphasized. All the participants were treated with respect, regardless of their age. Confidentiality was ensured by the anonymity of the data collected and by separating

the consent forms from the questionnaires. No personal information of participants appeared on the questionnaires.Data cleaning and management processes were meticulously executed to ensure data consistency and completeness. The assessment involved an exhaustive examination for duplicates, extreme values, distribution irregularities, and missing data using a combination of graphical methods such as histograms and scatter plots, along with statistical techniques like skewness tests and tabulations. The data was cleaned in Microsoft Excel and imported to Stata version 16 for analysis. Descriptions of the study population was done using summary and frequency statistics. A comparison was performed to examine the risky behavioural characteristics of the population stratified by adherence to ART among adolescents with perinatal HIV. This comparison involved the use of chi-square tests and t-tests, were employed. To investigate the association between risky behaviour and adherence to ART, unadjusted binary logistic regression was initially applied.

RESULTS

There was a total of 382 adolescents with HIV aged 14 to 20 years and have been on ART for at least 12 months. The prevalence of ART adherence among adolescents with perinatal HIV was 73.3% (Figure 1).

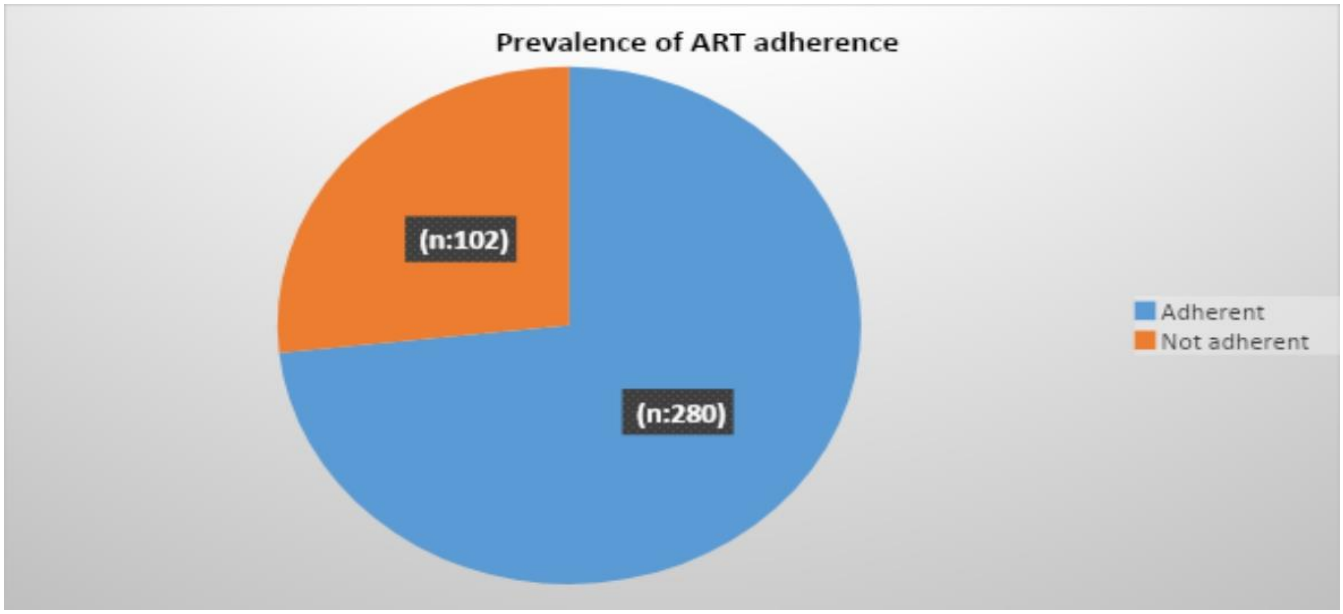

Figure 1: Prevalence of ART adherence among adolescents with perinatal HIV

The study population's median age was 16 years (interquartile range [IQR]: 14 – 18). Stratifying by adherence status, adolescents' adherent to ART had a median age of 15 years (IQR: 14 – 17), which was younger compared to those not adherent to ART with a median age of 17 years (IQR: 14 – 18). This difference in median age between adherent and non-adherent adolescents to ART was found to be statistically significant (P<0.01). Regarding gender distribution, 50.5% of the study participants were female, while 49.5% were male. The difference in proportions of the study population by sex was not statistically significant (P=0.57).

As for education levels, the majority of participants had secondary schooling as their highest education (81.9%), followed by primary (14.4%) and tertiary (3.7%). The differences in the highest education level among adolescents based on adherence status were not statistically significant (P=0.97). Regarding parenthood, a higher proportion (62.0%) of adolescents had a living father compared to 14.9% without fathers. Adherent adolescents had a higher proportion (63.6%) with living fathers compared to 57.8% of non-adherent adolescents with living fathers. This difference in adherence status based on the presence of a living father was statistically significant (P=0.01).

Concerning drug consumption, a significant majority of adherent adolescents were non-smokers (98.2%) compared to 88.2% of non-adherent adolescents

who did not adhere to ART. Similarly, a higher proportion of adherent adolescents were non-alcohol drinkers (83.4%) compared to 55.5% of non-adherent adolescents. These differences in smoking and alcohol consumption were both statistically significant (P<0.01).Among adolescents not adherent to ART, 53.5% were informed about the purpose of their treatment, while 49.1% of adherent adolescents were informed. Furthermore, the percentages of adolescents informed about specific treatment purposes were significantly different between the two groups (P<0.01).Regarding sexual activity, majority (83.2%) of adherent adolescents reported never having sexual intercourse (P<0.01). Additionally, 85.0% of adherent adolescents were not in a relationship at the time of the interview (P<0.01). For those who had engaged in sexual intercourse, 89.6% used condoms as a preventive measure during their first sexual encounter (P=0.38).

Table 2: Demographic and risky behavioural characteristics among adolescents with perinatal acquired HIV

Variables	ADHERENT			NON-ADHERENT		P
	%		N	%	N	
AGE (years)	Median (IQR)	15 (14 – 17)	280	17 (14 – 18)	102	<0.01 *
SEX	Female	49.6	139	52.9	54	0.57
	Male	50.4	141	47.1	48	
Highest education	Primary	14.3	40	14.9	15	0.97
	Secondary	82.1	230	81.2	82	
	Tertiary	3.6	10	3.9	4	
Mother ALIVE	No	36.6	102	34.3	35	0.68
	Yes	63.4	177	65.7	67	
FATHER ALIVE	No	26.4	74	39.2	40	0.01*
	Yes	63.6	178	57.8	59	
	Don't Know	10.0	28	2.94	3	
EVER SMOKED	No	98.2	275	88.2	90	<0.01 *
	Yes	1.8	5	11.8	12	
EVER DRANK ALCOHOL	No	83.4	231	55.5	56	<0.01 *
	Yes	16.6	46	44.5	45	
TREAMENT START AGE	1 – 5 years	33.2	93	36.2	37	0.93
	6 – 10 years	11.4	32	10.8	11	
	11 – 15 years	10.4	29	11.8	12	
	>16 years	0.4	1	1.00	1	
	Not sure	42.8	120	38.2	39	
	Birth	1.8	5	2.0	2	
TOLD REASON FOR TREATMENT	No	50.9	142	34.3	35	<0.01 *
	Yes	49.1	137	65.7	67	
EXPERIENCED ANY SIDE EFFECTS	No	56.1	156	42.2	43	0.02*
	Yes	43.9	122	57.8	59	
CONSIDERED STOPPING TREATMENT	No	87.3	241	67.7	69	<0.01 *
	Yes	12.7	35	32.3	33	
DELAYED TAKING PILLS	No	76.0	212	69.0	69	0.12
	Yes	24.0	67	31.0	31	
EVER HAD SEX	No	83.2	232	56.9	58	<0.01

ISSN# 2277-9604

						*
	Yes	16.8	47	43.1	44	
CURRENTLY IN A SEXUAL RELATIONSHIP	No	85.0	238	58.8	60	<0.01 *
	Yes	15.0	42	41.2	42	
AGE FOR FIRST SEX ENCOUNTER	12 – 14 years	8.9	4	14.3	6	0.9
	14 – 17 years	75.6	34	83.3	35	
	≥ 18 years	15.5	7	2.4	1	
CONDOM USED DURING FIRST SEX ENCOUNTER	No	10.4	5	16.7	7	0.38
	Yes	89.6	43	83.3	35	
RELATIONSHIP STATUS	Steady partner	15.7	44	41.0	41	<0.01 *
	Casual partner	2.9	8	2.0	2	
	No one	81.4	228	57.0	57	
No of sexual partners last 12 months	No partner	82.4	229	52.9	54	<0.01 *
	One partner	14.8	41	40.2	41	
	Two partners	0.36	1	1.0	1	
	>2 partners	2.52	7	5.9	6	
OVERALL CONDOM USE – PAST 6 MONTHS	Never use condom	0.0	0	2.4	1	0.47
	Always use condom	87.5	42	81.0	34	
	Sometimes use condom	12.5	6	16.6	7	
Benefits of knowing status	Improved adherence	3.6	3	2.8	1	0.45
	Understand why I am sick	29.8	25	41.7	15	
	Take care of myself	66.6	56	55.5	20	
REASON FOR NOT DISCLOSING STATUS	Afraid of stigma	2.4	2	0.0	0	0.54
	No courage to disclose	31.8	27	33.3	12	
	afraid of being judged	57.6	49	63.9	23	
	Other	8.2	7	2.8	1	

*P<0.05

The likelihood of adhering to ART decreases by 0.8 (with every 1-year increase in age among adolescents. There exists an inverse relationship between age and ART adherence status, meaning that as adolescents grow older, the probability of adhering to ART medication decreases. The odds of adhering to ART are 3.7 for adolescents who do not smoke compared to the odds of adhering to ART in adolescents who are smokers. The relationship between smoking and ART adherence is contingent on other factors remaining constant. Additionally, adolescents who do not consume alcohol have four times higher odds of adhering to ART [OR=4.0] compared to those who drink alcohol.Adolescents who were not informed about the purpose of their treatment had higher odds [OR=2.0] of adhering to

ART compared to those who received information about their treatment. Similarly, adolescents who did not experience any ART-related side effects had higher odds [OR=1.8] of adhering to ART compared to those who experienced side effects. Regarding sexual activity, higher odds of ART adherence were observed in adolescents who had never had sexual intercourse [OR=3.7] and those who were not in a relationship at the time of the interview [OR=4.0]. However, lower odds of ART adherence were observed in adolescents who were in a relationship with a steady partner [0.3]. More information on the unadjusted relationship between adolescents' behavioural characteristics and adherence to ART medication can be found in table 3.

Table 3: Unadjusted and adjusted multivariable logistic regression of the association between risky behaviour and adherence to ART.

Characteristic		UNADJUSTED		ADJUSTED	
		OR (95% CI)	P	OR (95% CI)	P
AGE(Years)	Median (IQR)	0.8 (0.7; 0.9)	<0.01*	0.7 (0.4; 1.4)	0.30
SEX	Male	1.1 (0.7; 1.8)	0.57	-	-
	Female	Ref			
HIGHEST EDUCATION	Secondary	1.1 (0.5; 2.0)	0.88	-	-
	Tertiary	0.9 (0.3; 3.4)	0.92		
	Primary	Ref			
MOTHER ALIVE	Yes	0.9 (0.6; 1.5)	0.67	-	-
	No	Ref			
FATHER ALIVE	Yes	1.6 (1.0; 2.6)	0.04*	6.8 (1.5; 31.9)	0.01*
	Don't Know	5.0 (1.4; 17.6)	0.01*	2.4 (0.1; 51.4)	0.59
	No	Ref		Ref	
EVER SMOKED	No	3.7 (2.3; 6.2)	0.00*	1.2 (0.2; 7.8)	0.84
	Yes	Ref		Ref	
EVER DRANK ALCOHOL	No	4.0 (2.4; 6.7)	0.00*	7.1 (1.5; 32.6)	0.01*
	Yes	Ref		Ref	
TREAMENT START AGE	6 – 10 years	1.1 (0.5; 2.5)	0.72	-	-
	11 – 15 years	0.9 (0.4; 2.1)	0.92		
	>16 years	0.4 (0.0; 6.5)	0.52		
	Not sure	1.2 (0.7; 2.1)	0.45		
	Birth	1.0 (0.2; 5.4)	0.99		
	1 – 5 years	Ref			
TOLD REASON FOR TREATMENT	No	2.0 (1.2; 3.2)	0.00*	2.2 (0.3; 16.6)	0.44
	Yes	Ref		Ref	
EXPERIENCED ANY SIDE EFFECTS	No	1.8 (1.1; 2.8)	0.02*	0.7 (0.2; 2.6)	0.55
	Yes	Ref		Ref	
CONSIDERED STOPPING TREATMENT	No	3.3 (1.9; 5.7)	0.00*	33.8 (2.5; 46.6)	0.00*
	Yes	Ref		Ref	
DELAYED TAKING	No	1.4 (0.9; 2.4)	0.17	1.8 (0.3; 10.9)	0.53
	Yes	Ref		Ref	

ISSN# 2277-9604

PILLS					
EVER HAD SEX	No	3.7 (2.3; 6.2)	0.00*	-	-
	Yes	Ref			
CURRENTLY IN A SEXUAL RELATIONSHIP	No	4.0 (2.4; 6.6)	0.00*	0.1 (0.0; 0.9)	0.04*
	Yes	Ref			
AGE FOR FIRST SEX ENCOUNTER	12 – 14 years	0.1 (0.1; 1.1)	0.06	0.1 (0.0; 0.4)	0.2
	14 – 17 years	0.1 (0.2; 1.2)		0.4 (0.0; 0.8)	0.03*
	≥ 18 years	Ref		Ref	
CONDOM USED DURING FIRST SEX ENCOUNTER	No	0.6 (0.2; 2.0)	0.39	-	-
	Yes	Ref			
RELATIONSHIP STATUS	Steady partner	0.3 (0.2; 0.4)	0.00*	0.1 (0.0; 0.4)	0.02*
	Casual partner	1.0 (0.2; 4.8)	0.99	0.2 (0.0; 0.7)	0.03*
	No one	Ref		Ref	
No of sexual partners last 12 months	No partner	3.6 (1.2; 11.3)	0.03*	-	-
	One partner	0.9 (0.3; 2.8)	0.79	0.2 (0.1; 2.6)	0.22
	Two partners	0.9 (0.1; 16.9)	0.92	-	-
	>2 partners	Ref		Ref	
OVERALL CONDOM USE – PAST 6 MONTHS	Never use condom	-	-	-	-
	Always use condom	1.4 (0.4; 4.7)	0.54		
	Sometimes use condom	Ref			
Benefits of knowing status	Improved adherence	1.1 (0.1; 10.9)	0.95	-	-
	Understand why I am sick	0.6 (0.3; 1.3)	0.21		
	Take care of myself	Ref			
REASON FOR NOT DISCLOSING STATUS	Afraid of stigma	-	-	-	-
	No courage to disclose	0.3 (0.1; 2.9)	0.31		
	afraid of being judged	0.3 (0.1; 2.6)	0.28		
	Other	Ref			

*P<0.05

The findings of this adjusted regression analysis reveal important insights into the factors influencing adherence to antiretroviral therapy (ART) among adolescents. We observed that the presence of a living father was significantly associated with higher odds of adherence to ART medication. Adolescents with fathers that were still alive demonstrated substantially increased odds [OR=6.8] of adhering to their prescribed treatment (ART), as compared to participants whose fathers were not alive (P=0.01).

Furthermore, alcohol consumption emerged as another significant determinant of ART adherence. Adolescents who did not consume alcohol exhibited notably higher odds [OR=7.1] of adhering to their medication compared to their counterparts who

engaged in alcohol consumption. Adolescents who never contemplated stopping their treatment displayed remarkably higher odds [OR=33.8] of adhering to ART medication compared to those who had considered stopping their treatment at least once.

Age played a significant role in ART adherence among adolescents. Those in the 14 to 17 years' age group exhibited lower odds [OR=0.4] of adhering to ART medication compared to adolescents aged at least 18 years. Adolescents with a steady partner demonstrated reduced odds [OR=0.1] of adhering to ART medication, as did those with a casual partner [OR 0.2 (0.0; 0.7)], compared to adolescents without a current partner at the time of the interview.

DISCUSSION

The prevalence of ART adherence among adolescents with perinatal HIV in our study was found to be 73.3%. These findings are important as they shed light on the challenges faced by adolescents with perinatal acquired HIV in adhering to their antiretroviral therapy medication. The prevalence of ART adherence among adolescents with perinatal HIV in our study aligns with previous research findings. For instance, a study conducted in the USA reported that 75% of youth with perinatally acquired HIV were taking their ART regimen consecutively for a 6-month period, indicating a higher adherence rate compared to youth with behaviourally acquired HIV infection, where only 33.4% were adherent to their ART regimen. This highlights the need for tailored interventions that address the specific needs and challenges faced by adolescents with perinatal HIV to improve their adherence to ART medication.

The results of our study indicate that risky behaviours, such as smoking, drinking alcohol, engaging in sexual intercourse, being in a sexual relationship, and relationship status, significantly impacted ART adherence among HIV-positive adolescents. These findings are consistent with previous research that highlights the influence of behavioural factors on ART adherence among adolescents.[23-25] The impact of risky behaviours on ART adherence underscores the need for comprehensive interventions that address not only HIV treatment but also address the underlying factors contributing to these behaviours such as substance use and sexual activity. The findings of this study provide important insights into the factors influencing ART adherence among adolescents with perinatal-acquired HIV.[26] These factors include the presence of a living father, alcohol consumption, contemplation of treatment cessation, age, and relationship status.

The presence of a living father was found to have a significant association with higher odds of adhering to ART medication among adolescents with perinatal HIV. Adolescents who had a living father demonstrated substantially increased odds of adhering to their prescribed treatment compared to those without a living father. This finding highlights the potential role of paternal support and involvement in promoting adherence to ART medication among HIV-positive adolescents. The results of our study align with previous research that has identified the influence of family support on ART adherence in adolescents. One study found that better adherence to ART was associated with higher levels of adult supervision and support.[27]

Additionally, the role of paternal presence in influencing ART adherence has also been highlighted in previous research. For example, a study conducted in the United States found that adolescents with perinatally acquired HIV infection and living with their biological fathers had higher rates of ART adherence compared to those living with other family members or in non-family settings.[23] These findings collectively suggest that the presence of a supportive and involved father figure can contribute to improved adherence to ART medication among HIV-positive adolescents.

Alcohol consumption emerged as another significant determinant of ART adherence in our study. Adolescents who did not consume alcohol exhibited higher odds of adhering to their medication compared to those who engaged in alcohol consumption. This finding underscores the potential impact of substance use, specifically alcohol consumption, on treatment compliance among HIV-positive adolescents. The result aligns with previous studies that have also reported a negative association between substance abuse, including alcohol consumption, and ART adherence in adolescents with HIV.[23] One study conducted in South Africa found

ISSN# 2277-9604

that alcohol misuse was associated with lower ART adherence among youth living with HIV.[28] These findings highlight the need for targeted interventions to address substance use and provide support for adolescents in maintaining treatment adherence.

The consideration of treatment cessation also emerged as a crucial factor influencing adherence to ART in our study. Adolescents who never contemplated stopping their treatment had significantly higher odds of adhering to ART medication compared to those who had considered stopping their treatment at least once. This suggests that the mindset and attitude toward treatment cessation can have a profound impact on ART adherence among HIV-positive adolescents. Our findings are consistent with previous research that has shown a positive association between treatment cessation and adherence to ART in adolescents with HIV. One study found that HIV-positive adolescents who reported never considering stopping their treatment had higher rates of adherence compared to those who had considered stopping or had stopped their treatment.[28]Age also played a significant role in ART adherence among adolescents in our study. Adolescents in the 14 to 17 years' age group exhibited lower odds of adhering to ART medication compared to adolescents aged at least 18 years. This finding is consistent with previous research that has shown age-related differences in ART adherence among adolescents with HIV.[29] Our results suggest that older adolescents may have a better understanding of the importance of adherence and the consequences of non-adherence. Ensuring adherence to antiretroviral therapy among adolescents with HIV can present unique challenges (Joseph et al., 2022).[36] A qualitative study conducted in Canada with HIV-positive young people highlighted some of these challenges. The study found that confusion and misunderstandings about HIV treatment, disruptions to daily life, and difficulties in adhering to medication were common barriers to adherence among HIV-positive adolescents.[30]The influence of relationship status on ART adherence among adolescents was also evident in our study. Adolescents with a steady partner or a casual partner demonstrated reduced odds of adhering to ART medication compared to adolescents without a current partner at the time of the interview. These findings suggest that relationship dynamics may present challenges to consistent medication adherence among HIV-positive adolescents. Adolescents with steady or casual partners may face additional barriers to adherence, such as hormonal changes, relationship conflicts, or concerns about disclosure of HIV status to their partners. Furthermore, research conducted in low- and middle-income countries has also identified relationship factors as important determinants of ART adherence among adolescents.[24] For instance, a study conducted in South Africa found that adolescents who were in a relationship were less likely to adhere to ART compared to those who were not in a relationship.[28] Other studies have echoed these findings, highlighting the impact of relationship dynamics on ART adherence among adolescents with HIV. The influence of relationship status on ART adherence among adolescents deserves further exploration and attention.Ensuring adherence to antiretroviral therapy among adolescents with HIV can present unique challenges, particularly for those who are in relationships. These challenges can include difficulties in maintaining consistent medication schedules, concerns about disclosure of HIV status to partners, and conflicts within the relationship that may disrupt adherence to medication. Several factors may contribute to these challenges. One factor is the level of knowledge and understanding about HIV treatment among adolescents.Adolescents may have confusion or misunderstanding about their treatment, feeling like they have no choice about it, or experiencing disruptions to their lives. Another factor is the influence of relationship dynamics on medication adherence. Relationship factors, such as having a steady or casual partner, have been found to be associated with reduced odds of adherence to ART medication among HIV-positive adolescents.[31] These challenges are not limited to adolescents in high-income countries but are also prevalent in low- and middle-income countries.

CONCLUSION

This study indicated that adherence and risky behaviours remains a challenge on the treatment outcomes of adolescents with perinatal acquired HIV as reported in similar studies. Several factors such as the presence of a living father, alcohol consumption, consideration of treatment cessation, age, and relationship status were found to have an association with adherence. The findings of this study although based on a smaller population can assist public health

ISSN# 2277-9604

practice by providing baseline insight into the association of adherence and risky behaviours among adolescents with perinatal acquired HIV. This type of research is crucial for understanding the complex interplay between HIV treatment adherence and risky sexual behaviors among a vulnerable population. Understanding the factors influencing risky sexual behavior can help in developing targeted interventions to reduce transmission risks within this specific population.Tailored interventions may include peer support programs, community outreach, and collaboration with healthcare providers to create a holistic approach to care.

RECOMMENDATIONS

The following recommendations are proposed based on the study findings:

1. Further research on the association of risky behaviours and adherence among adolescents with PHIV for deeper understanding and improvement of health outcomes.
2. Strengthening the impact of risky health behaviours in primary schools to gain more insight and awareness.
3. Promoting early disclosure and support to adolescents with PHIV by empowering caregivers on HIV and issues of disclosure.
4. Health care workers to assist adolescents with PHIV and caregivers in developing support groups whereby they will be able to ventilate their issues and be able to ask questions without fear of being judged. More emphasis on adherence, measures to prevent HIV transmission, and health risk behaviours.
5. Future researchers to develop intervention programs to support adolescents with perinatal acquired HIV.

ISSN# 2277-9604

REFERENCES

1. World health Organization. Health for the world's adolescents: a second chance in the second decade Geneva, Switzerland, 2014
2. Slogrove AL, Sohn, AH. The global epidemiology of adolescents living with HIV: time for more granular data to improve adolescent health outcomes. Current Opinion in HIV and AIDS, 2018;13(3):170–178.
3. UNICEF. Children, HIV and AIDS: global and regional snapshots, 2018. Available at: https://data.unicef.org/resources/children-hiv-and-aids-global-and-regional-snapshots/. [Accessed 18 Feb 2019].
4. Ssewanyana D, Mwangala PN, van Baar A, Newton CR, Abubakar A. Health Risk Behaviour among Adolescents Living with HIV in Sub-Saharan Africa: A Systematic Review and Meta-Analysis. BioMed Res Int, 2018, 7375831.
5. Mokgatle MM, Menoe B. Prevalence of sexual coercion among students in an institution of higher learning in Gauteng Province, South Africa: sexual behaviour. African Journal for Physical Health Education, Recreation and Dance, 2014;20(sup-1):301–312.
6. Nglazi MD, Kranzer K, Holele P, Kaplan R, Mark D, Jaspan H, Lawn SD, Wood R, Bekker LG. Treatment outcomes in HIV-infected adolescents attending a community-based antiretroviral therapy clinic in South Africa. BMC Infec Dis, 2012;12, 21.
7. Makadzange AT, Higgins-Biddle M, Chimukangara B, Birri R, Gordon M, Mahlanza T, McHugh G, van Dijk JH, Bwakura-Dangarembizi M, Ndungu T, Masimirembwa C, Phelps B, Amzel A, Ojikutu BO, Walker BD, Ndhlovu CE. Clinical, Virologic, Immunologic Outcomes and Emerging HIV Drug Resistance Patterns in Children and Adolescents in Public ART Care in Zimbabwe. PloS One, 2015;10(12):e0144057.
8. UNAIDS. The gap report, Geneva: UNAIDS, 2014.
9. Kalomo EN, Liao M, Besthorn F, Shilunga APK, Mbapaha C. To tell or not to tell: Dimensions of disclosure to children with HIV in the Zambezi region of Northern Namibia. J HIV/AIDS Soc Serv, 2017;16(3):250–268.
10. Agwu AL, Fairlie L. Antiretroviral treatment, management challenges and outcomes in perinatally HIV-infected adolescents. J Int AIDS Soc, 2013;16(1):18579.
11. Madiba S. The impact of fear, secrecy, and stigma on parental disclosure of HIV status to children: a qualitative exploration with HIV positive parents attending an ART clinic in South Africa. Glob J Health Sci, 2012;5(2):49–61.
12. Turissini ML, Nyandiko WM, Ayaya SO, Marete I, Mwangi A, Chemboi V, Warui L, Vreeman RC. The Prevalence of Disclosure of HIV Status to HIV-Infected Children in Western Kenya. J Pediatric Infect Dis Soc, 2013;2(2):136–143.
13. Vaz LM, Maman S, Eng E, Barbarin OA, Tshikandu T, Behets F. Patterns of disclosure of HIV status to infected children in a Sub-Saharan African setting. J Dev Behav Pediatr, 2011;32(4):307–315.
14. Vreeman RC, Scanlon ML, Mwangi A, Turissini M, Ayaya SO, Tenge C, Nyandiko WM. A cross-sectional study of disclosure of HIV status to children and adolescents in western Kenya. PloS One, 2014;9(1):e86616.
15. Madiba S, Mokgatle M. Perceptions and Experiences about Self-Disclosure of HIV Status among Adolescents with Perinatal Acquired HIV in Poor-Resourced Communities in South Africa. AIDS Res Treat, 2016;2607249.
16. Mellins CA, Brackis-Cott E, Leu CS, Elkington KS, Dolezal C, Wiznia A, McKay M, Bamji M, Abrams EJ. Rates and types of psychiatric disorders in perinatally human immunodeficiency virus-infected youth and seroreverters. J Child Psychol Psychiatry Allied Discip, 2009;50(9):1131–1138.
17. Inzaule SC, Hamers RL, Kityo C, Rinke de Wit TF, Roura M. Long-Term Antiretroviral Treatment Adherence in HIV-Infected Adolescents and Adults in Uganda: A Qualitative Study. PloS One, 2016;11(11):e0167492.
18. Nabukeera-Barungi N, Elyanu P, Asire B, Katureebe C, Lukabwe I, Namusoke E, Musinguzi J, Atuyambe L, Tumwesigye N. Adherence to antiretroviral therapy and retention in care for adolescents living with HIV from 10 districts in Uganda. BMC Infec Dis, 2009;15:520.
19. Shroufi A, Gunguwo H, Dixon M, Nyathi M, Ndebele W, Saint-Sauveur JF, Taziwa F, Ferreyra C, Viñoles MC, Ferrand RA. HIV-infected adolescents in southern Africa can achieve good treatment outcomes: results from a retrospective cohort study. AIDS (London, England), 2013:27(12):1971–1978.
20. Bikaako-Kajura W, Luyirika E, Purcell DW, Downing J, Kaharuza F, Mermin J, Malamba S, Bunnell R. Disclosure of HIV status and adherence to daily drug regimens among HIV-infected children in Uganda. AIDS Behav, 2006;10(4 Suppl):S85–S93.
21. Statistics South Africa (STATS SA). Demographic profile of adolescents in South Africa, 2016. Available at: http://www.statssa.gov.za/publications/Report03-00-10/Report03-00-102016.pdf
22. Etikan I. Comparison of Convenience Sampling and Purposive Sampling. Am. J Theor Appl Stat, 2016;5:1. 10.11648/j.ajtas.20160501.11.
23. Xu L, Munir K, Kanabkaew C, Le Coeur S. Factors influencing antiretroviral treatment suboptimal adherence among perinatally HIV-infected adolescents in Thailand. PloS One, 2017;12(2): e0172392.
24. Naidoo K, Munsami A, Archary M. Adolescent antiretroviral management: Understanding the complexity of non-adherence. SAMJ, 2015;105(11):953.
25. Munyayi FK, van Wyk B. Closing the HIV Treatment Gap for Adolescents in Windhoek, Namibia: A Retrospective Analysis of Predictors of Viral Non-Suppression. Int J Environ Res Public Health, 2022;19(22):14710.
26. Van Wyk B, Teti M. Portraits of HIV: a pilot photovoice study of adolescent experiences with HIV treatment in South Africa. JoGHR, 2020;4. 0.29392/001c.12588.
27. Brittain K, Myer L, Phillips N, Cluver LD, Zar HJ, Stein DJ, Hoare J. Behavioural health risks during early adolescence among perinatally HIV-infected South African adolescents and same-age, HIV-uninfected peers. AIDS care, 2019;31(1):131–140.
28. Haghighat R. Bungane N, Cluver L. The HIV care cascade for adolescents initiated on antiretroviral therapy in a health district of South Africa: a retrospective cohort study. BMC Infec Dis, 2021;21(1): 60.
29. Alcon S, Ahmed B, Sloane D, Lim YS, Cervia JS. Interventions to improve medication adherence in adolescents with HIV: a systematic review and meta- analysis. J Investig Med 2020;68:1217–1222. doi:10.1136/jim-2020-001295.

30. Joseph RS, Mahiti GR, Frumence G, Ulrich CM. Qualitative inquiry into adolescents' experience of ethical challenges during enrolment and adherence to antiretroviral therapy (ART) in Temeke Regional Referral Hospital, Tanzania. BMC Med Ethics, 2020;23(1):22.

31. Bidu KT, Babure ZK. Assessment of Sexual Abuse and Associated Factors Among Adolescents in High Schools, Nekemte Town, East Wollega Zone, Oromia Regional State, Western Ethiopia, 2017. J Nurs Care, 2018;7:1–4.