



ORIGINAL RESEARCH

Disclosure Status and Associated Factors among Caregivers of Children on Antiretroviral Therapy in Addis Abeba, Ethiopia: Hospital Based Cross Sectional Study Design

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Abstract

Background: Disclosure has become an essential part of the care for HIV-infected children in antiretroviral therapy clinics. One of the greatest psychosocial challenges that parents and caregivers of infected children face is the disclosure of Human Immunodeficiency Virus positive status to their infected children.

Objectives: The aim of this study was to assess the magnitude of disclosure status and associated factors among caregivers of children on antiretroviral therapy in Addis Abeba, Ethiopia 2021.

Methods: A hospital based cross sectional study design was conducted at government hospital under A.A city administration from Nov to Feb 2021. Systematic random sampling technique was used to select, care giver/parents. Data was collected by interview using pre-test structured questionnaires. Descriptive statistics were used to illustrate the means, standard deviations, and frequencies of the study variables. Bivariate logistic regression was performed and those variables whose *p*-values less than or equal to 0.25 was fitted into multiple logistic regression and *P*-values less than or equal to 0.05 was considered as statistically significant.

Results: With 96.8% response rate, the disclosure status of this study is high with One hundred sixty-seven (53.9%) of the children knowing their positive HIV status. Factors which have showed to increase the likelihood of HIV disclosure status are children in age group 10-15 years were [AOR = 1.5 (3.071-5.256)], children who were on ART from 6 to 13 years were [AOR = 3 (1.093-1.501)], children with good

treatment adherence AOR [2(1.241-3.487)] and children who got adequate advice from health care provider were [AOR = 2.1 (5.728-6.527)].

Conclusion and recommendation: Although the prevalence of HIV-positive status disclosure to infected children in Addis Ababa is high (53.9%) and has shown an improvement compared to previous findings, it still indicates that there is still much work to be done. The main reasons for disclosure were because of repeated question from the child. Children's' young age and fear of discrimination was the main reason for non-disclosure of their HIV status. The study recommends that health care workers should give age-appropriate counselling, support, and work together with caregivers on the processes of disclosing their diagnostic result to infected children. It also recommends that Ministry of Health, stakeholders (NGO's) and policy makers to give special emphasis on health care institutions and health care workers that deal with these situations by providing them resources and guidelines.

Keywords

Human immunodeficiency virus status disclosure, Children, Caregivers, Highly active anti-retroviral therapy, Ethiopia

Abbreviations

AIDS: Acquired Immuno Deficiency Syndrome; ART: Anti-Retroviral Therapy; AOR: Adjusted Odds Ratio; DHS: Demographic and Health Survey; ETB: Ethiopia Birr; FMOH: Federal Ministry of Health; HAART: Highly Active Anti-Retroviral Therapy; HCW: Health Care Workers; HIV: Human Immunodeficiency Virus; MOH: Ministry of Health;



Citation: Wondmneh Y, Demissie DB (2024) Disclosure Status and Associated Factors among Caregivers of Children on Antiretroviral Therapy in Addis Abeba, Ethiopia: Hospital Based Cross Sectional Study Design. Int Arch Nurs Health Care 10:195. doi.org/10.23937/2469-5823/1510195

Accepted: February 13, 2024; **Published:** February 15, 2024

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MTCT: Mother to Child Transmission of HIV; NGOs: Non-Governmental Organizations; PMTCT: Prevention Mother to Child Transmission; UNAIDS: United Nation for HIV/AIDS; VCT: Voluntary Counselling and Testing; WHO: World Health Organization

Introduction

Human immunodeficiency virus Acquired immune deficiency syndrome has created an enormous challenge to mankind since its recognition; People living with HIV (PLWH) account 36.7 million worldwide; of this 32.1 million are adults and 3.3 million Children under 15 years of age in 2015 [1]. Almost 91% of all HIV infected children live in sub-Saharan Africa [2] and about 160,000 living in Ethiopia; around 21,686 are taking ART treatment [3]. Although there has been significant improvement in ART coverage among children, it is still low compared to adults. At the end of 2016, it was estimated that only 43% of children aged < 15 years living with HIV/AIDS were receiving ART [4].

As highly active antiretroviral therapy (HAART) becomes increasingly available in low resource settings, infected children are living longer [5]. With increased survival, one of the greatest challenges that parents and caregivers of HIV-infected children face is the disclosure of HIV-positive status to their infected children, among these difficult issues that families with HIV infected children face are when and how to talk about HIV to their children. Disclosure is contingent on the caregiver's acknowledgement of the illness, the readiness to disclose, and child's cognitive skills and emotional maturity [6].

Human immunodeficiency virus Acquired immune deficiency syndrome disclosure becomes more significant because of the multiple benefits for the children and their caregivers [7]. Disclosure is related to good or improved adherence to ART medications and influences children's participation in healthcare decision-making. It also enables children to understand HIV infection and make sense of their disease-related experiences as well as the importance of adherence [8]. Children have the right to know their HIV status and disclosure of it after diagnosis is crucial for their wellbeing. Factors affecting lack of disclosure include the depth of information to be shared, the manner and time of disclosure, which caregivers and healthcare workers should consider [9]. Early disclosure is more appropriate than immediate and unplanned disclosure upon entrance into the adult clinic, and also helps to reduce HIV transmission [10].

In 2011, WHO released a guideline on HIV status disclosure in children recommends that disclosure process should start when the child is 6-years-old and be completed at the age of 12 years [11]. The prevalence of disclosure of HIV status to children in sub-Saharan Africa is not well described. The limited existing studies from low- and middle-income countries suggest that

disclosure is still relatively rare. Evidence from a recent systematic review shows that the majority of the children less than 18 years living with HIV in resource limited settings, including sub-Saharan Africa, are not aware of their own HIV status [12]. In Ethiopia, studies showed that the prevalence of disclosure among caregivers' of children varies from 16.3 to 39.5% [13-15]. In addition to the low frequency of disclosure in Ethiopia, little is known about the associated factors of HIV disclosure in school-aged children.

HIV status disclosure improves children's health and disease progression, enables them to understand their HIV infection, improves adherence to ART medications, and enhances long-term care quality. Understanding caregivers' reasons and experiences during HIV diagnosis disclosure is crucial for preventing non-disclosure to children [8,16,17].

There is a general consensus among researchers that caregivers especially in developing countries remain reluctant to disclose the HIV diagnosis to HIV infected children and the frequency of disclosure of HIV status to infected children has been found to be low in resource-limited settings, only a few children with PHIV+ know their HIV-positive status furthermore, little is known about pediatric HIV disclosure about the complex issues of when and how to tell a child about the HIV diagnosis. Caregivers are also presented with set of challenges including deciding on what is in the child's best interest and when, why and how information about his/her HIV positive status should be shared with him/her. They are also reluctant to disclose the HIV positive status to their children for fear of social rejection and isolation, parental sense of guilt, and fear that the child would not keep diagnosis to themselves [18-20]. Understanding magnitude and associated factors of HIV status disclosure to HIV/AIDS infected children may therefore help in preparation of implementation strategies to improve disclosure processes and the quality of life of children living with HIV/AIDS in Addis Ababa.

Even though the growing evidence of the benefits of disclosure from developed countries disclosure to HIV infected children in developing countries continues to be delayed until older childhood, Paediatric HIV providers generally believe that disclosure is important for helping children understand the need for ART and for creating trusting relationships that facilitate adherence. Thus, this study assessed the magnitude of HIV status disclosure and its associated factors among caregivers of children on follow up of HAART at selected governmental hospital in Addis Ababa.

Methods and Materials

Study area and period

A hospital-based cross-sectional study design was conducted from the 1st of December to the 20th of February 2021 in two public hospitals providing pediatric

ART services in the Addis Ababa city administration. Addis Ababa is the capital of the Addis Ababa city administration's health bureau, which provides pediatric ART. Addis Ababa is the capital city of Ethiopia and the diplomatic capital of Africa. It is located in the central part of the country. Addis Ababa covers an area of 527 km². Based on the 2007 National Census and using population projections for 2017, Addis Ababa has an estimated total population of over 4 million. There are a total of 99 health centers, 12 governmental hospitals, 36 private hospitals, 700 clinics, and 35 nongovernmental organizations currently serving the 2715 children under 15 on HAART in Addis Ababa. From November to February 2021, this research was carried out in Addis Ababa. All caregivers of HIV-positive children aged 6 to 15 years are receiving ART services at the pediatric ART clinics of four (4) Addis Ababa city administration hospitals. Caregivers of children infected with HIV aged 6-15 who were on care and support follow-up in a pediatric ART clinic during the study period were included in this study.

Sample size determination and procedure

The sample size of study participants was determined using the single population proportion formula, and the following assumptions were used for sample size calculation: 40% of HIV/AIDS disclosure among children living with HIV/AIDS is taken as 0.4 [21], 5% of the marginal error finite population correction formula is applied after the initial n , 10% non-response rate, and considering the design effect. In a given year, 2415 patients attend chronic ART care follow-up, resulting in a final sample size of 320.

The four public hospitals in Addis Ababa City Administration were selected using simple random sampling techniques, and a systematic random sampling technique was used for care providers. The number of respondents was proportionally allocated to the selected hospitals, and all eligible caregivers were interviewed during their children's monthly follow-up visits at each hospital sampling technique from the records of each selected facility.

Operational definitions

Disclosure refers to when the caregiver says that the child knows his or her HIV/AIDS diagnosis regardless of who told him or her.

Non-disclosure: When the caregiver stated that the child is unaware of his or her infection or when the caregiver was unsure whether the child was aware of his or her status.

Caregiver: A person who lives with the child, participates in the child's daily care, and is the most knowledgeable about the child's health. They were either the child's biological parents or guardians, such as an aunt, or an adoptive parent acting as surrogate parents.

Child: According to the Convention for Child Rights, to which Ethiopia is party, "as child means every human being below the age of eighteen years." But for this study, a child is defined as being between the ages of 6 and 15, in line with HIV/AIDS-related publications (e.g., the UNAIDS AIDS in Ethiopia report), which used 15 years of age as the cut-off point for children. Furthermore, people over the age of 15 can access voluntary counseling and testing with their own consent and do not need parental permission to learn their HIV status [3,22].

Data collection procedure and tools

The data was collected using a pre-tested structured questionnaire which is adopted from review of different literatures prepared specifically for this study [15,16,18]. Data was collected using a pre-tested structured questionnaire which was first prepared in English then translated to the local language Amharic and back to English. The questionnaires were administered to caregivers of children aged 6 to 15 years who were attending the pediatric ART clinics during the data collection period. Data collection was conducted by 4 trained data collectors and 2 supervisors ART trained and who have working experience at the clinic. The principal investigator supervised the data collectors and supervisor.

Data quality control

A-two-day training was given by the principal investigator to the data collectors and supervisor who supervised the data collection. To ensure data quality, the questionnaire was prepared in English and then translated to Amharic. There were also practical sessions to skill them how to administer the questionnaire. During data collection data collectors reviewed every questionnaire for completeness and for logical consistency.

Data processing and statistical analysis plan

The data was entered and cleaned using EPI Info version 7.2.1.0 and then exported to SPSS version 25 statistical software for analysis. Statistical tests and measures of association were used as necessary. Binary logistic regression was performed, and those variables whose p -values were less than or equal to 0.25 were fitted into multiple logistic regression and P -values less than or equal to 0.05 were considered statistically significant. A P -value less than 0.05 was used for identifying statistically significant variables multivariate analysis. Thus, the independent effect of each explanatory variable on the outcome variable was determined while controlling for others.

Result

Out of 320 sampled respondents in the selected hospitals during the study period, 310 agreed to participate, and the response rate was 96.8%. The

respondents were from Yekatit 12 Hospital, 200 (64.5%), and Zewditu General Hospital, 110 (35.4%).

Sociodemographic characteristics of caregivers

Approximately 62.9 percent of the 310 caregivers of children aged 6 to 15 who participated in the study were female. Most of the respondents (39.5%) were within the age range of 36-45 years. About 103 of the respondents had a secondary school educational status. One hundred forty-four of the respondents were married, and 132 of them were privately employed. Most of the respondents

(57.1%) had a monthly income of \$1,000-5,000 and 58.7% had a family size of 1-5, and nearly 71% of caregivers were the biological parents of the children for whom they provided detaining care (Table 1).

Socio-demographic characteristics of children

The majority of HIV-positive children were boys (53.2%), 70.3% were between 10-15 years-old, 73.9% attended primary school, 69.7% were living with their biological parents, and one hundred twenty-four lost parents see details in Table 2.

Table 1: Information on socio-demographic characteristics of caregivers', Addis Ababa, Ethiopia, 2021.

Characteristics	Frequency	Percentage	
Age of caregiver	< 25	10	3.2
	26-35	77	24.8
	36-45	122	39.4
	45-55	61	19.7
	> 55	40	12.9
Sex of caregiver	Male	115	37.1
	Female	197	62.9
Religion	Orthodox	144	46.5
	Muslim	79	25.5
	Protestant	82	26.5
	Catholic and Others specify	5	1.6
Educational status	Unable to read and write	8	2.6
	Able to read and write	37	11.9
	Primary (1-8)	70	22.6
	Secondary (9-12)	103	33.2
	Tertiary (diploma and above)	92	29.7
Ethnicity	Amhara	108	34.8
	Oromo	68	21.9
	Tigray	63	20.3
	Wolita	23	7.4
	Others (specify)	48	15.4
Marital status	Married	144	46.5
	Single	26	8.4
	Widowed	101	32.6
	Divorce	39	12.6
Occupation	Unemployed	23	7.4
	Daily labour	21	6.8
	Government employ	43	13.9
	Private employ	132	42.6
	Housewife	65	21
	Merchant and Others	26	8.4
Monthly income	< 1000	5	1.6
What is your base for this category	1000-5000	177	57.1
	5000-10000	103	33.2
Should base on Ethiopian salary taxation..... Rate	> 10000	25	8.1
What is average monthly income			
Family size	1-5	182	58.7
	> 5	128	41.3

What is your Relationship to the child?	Mother	149	48.1
	Father	69	22.3
	Grand parent	46	14.8
	Siblings	13	4.2
	Relatives	31	10
	Others	2	0.6

Table 2: Socio-demographic characteristics of the child, Addis Ababa, Ethiopia, 2021.

Characteristics		Frequency	Percentage	
Age of the child?	6-9	92	29.7	
	10-15	218	70.3	
Sex of the child?	Male	165	53.2	
	Female	145	46.8	
Educational status of the child	Not started education	9	2.9	
	Kindergarten	34	11	
	Primary school (1-8)	226	72.9	
	Secondary school (9-12)	41	13.2	
With whom the child is currently living	Biological parents	216	69.7	
	Grandparents	47	15.2	
	Siblings	17	5.5	
	Relatives	28	9	
	Others	2	0.6	
Has the child lost any of his/her nucleus family members with HIV?	Yes	Mother only	27	8.7
		Father only	42	13.5
		Both	55	17.7
	No		186	60

Clinical characteristics of caregivers and children

Among the caregivers, 189 (61%) are HIV positive. Among those, 127 (41%) of them have disclosed their status to their partner, and 183 (59%) of them have started ART. One hundred thirty-two (42.6%) of the children were referred from PMTCT, and 276 (89%) were between the ages of one and six when they were diagnosed. majority (64.8%) of them had stage one HIV, with 20 (6.5%) of the children having a recent > 500 CD4 count. From those who started ART, 261 (84%) started ART between the ages of 1 and 5, and 168 (54.2%) children had an additional medication of Bactrim. Sixty-nine percent have good adherence to the medication, 127 (41% of the children affected) have been affected by opportunistic disease, and 70 (22.6%) have been hospitalized. 238 (76%) of the participants have discussed disclosure issues with their health care providers, and 48 (15.5%) have received support from governmental and non-governmental organizations see details in [Table 3](#).

HIV positive status disclosure among HIV positive children

According to the study's findings, 167 caregivers (53.9%) disclosed their HIV positive status to their child him/herself ([Figure 1](#)).

Forty-four percent were disclosed to them between

the ages of seven and twelve. Seventeen percent were disclosed to them by a health professional. A total of 115 children whose status was not disclosed believed it should be disclosed after the age of 18, and 58 percent of caregivers believed or expressed concern that their child would be stigmatized ([Table 4](#)).

One hundred sixty-seven of the study participants have told them about the children's HIV status. Twenty-one percent disclosed it because of repeated questions from the child, while the rest (79%) disclosed it because the child was thought to be mature enough to take or adhere to medications, to know about his or her disease condition, to take care of him or herself and prevent disease transmission, to share responsibility, and to get relief ([Figure 2](#)).

Out of the total study participants, one hundred forty-three of the caregivers did not disclose the diagnosis of HIV infection to their children. 35 percent of these participants delayed disclosure because they believed the child was too young to understand the diagnosis, and 21.7 percent feared social rejection (fear of stigma and discrimination).

Outcome of HIV positive status disclosure on HIV positive children

From the participants 53.9% disclosed their HIV status

Table 3: Clinical characteristics of caregivers and children in Addis Ababa, Ethiopia, 2021.

Clinical characteristics		Frequency	Percentage	
HIV status of caregiver?	Positive	189	61	
	Negative	104	33.5	
	Not tested	17	5.5	
If positive to whom did you disclose your positive status?	To my partner	127	41	
	To my child	36	11.6	
	To my relatives	20	6.5	
	To my friends	2	0.6	
	No one know	50	16.5	
	Religious fathers	4	1.3	
Did the caregiver start ART	Yes	183	59	
	No and Others (specify)	8	2.6	
From where the child got referred for HIV screening?	Hospital	119	38.4	
	PMTCT	132	42.6	
	Community clinic	3	1	
	Private clinic and NGO clinic	5	1.6	
	Government health centre	50	16.1	
	Others (foster care)	1	0.3	
Age at diagnosis of HIV positive status of the child?	1-6	276	89	
	6-13	34	11	
WHO clinical stage of the child?	Stage I	201	64.8	
	Stage II	65	21	
	Stage III	29	9.4	
	Stage IV	15	4.8	
Most resent CD4 count of the child	Yes	< 200	14	4.5
		200-499	3	1
		> 500	20	6.5
	No	273	88.1	
Did the child start ART?	Yes	1-5	261	84.2
		6-13	47	15.2
	No	2	0.6	
Duration on ART?	1-5	46	14.9	
	6-13	262	85.1	
What other medication took the child other than ART?	Bactrim	168	54.2	
	Anti-TB	19	6.1	
	Multi-vitamin	20	6.5	
	RTUTF	17	5.5	
	Others	86	27.7	
How is treatment adherence of the child?	Good	214	69	
	Fair	71	22.9	
	Poor	25	8.1	
Has the child ever been affected with opportunistic disease previously?	Yes	127	41	
	No	183	59	
Did the child get hospitalized previously?	Yes	70	22.6	
	No	240	77.4	
Did you discuss about disclosure issue with your child's health care provider?	Yes	238	76.8	
	No	72	23.2	
If yes, did the health care provider adequately cover the issues like disclosure?	Yes	212	68.4	
	No	26	8.4	

Did the child get support from other organizations?	Yes	Government organization	26	8.4
		NGO	22	7.1
	No		262	84.5
What kind of support did he/she get?	Counselling		4	1.3
	Money		19	6.1
	Material		13	4.2
	Food		12	3.9

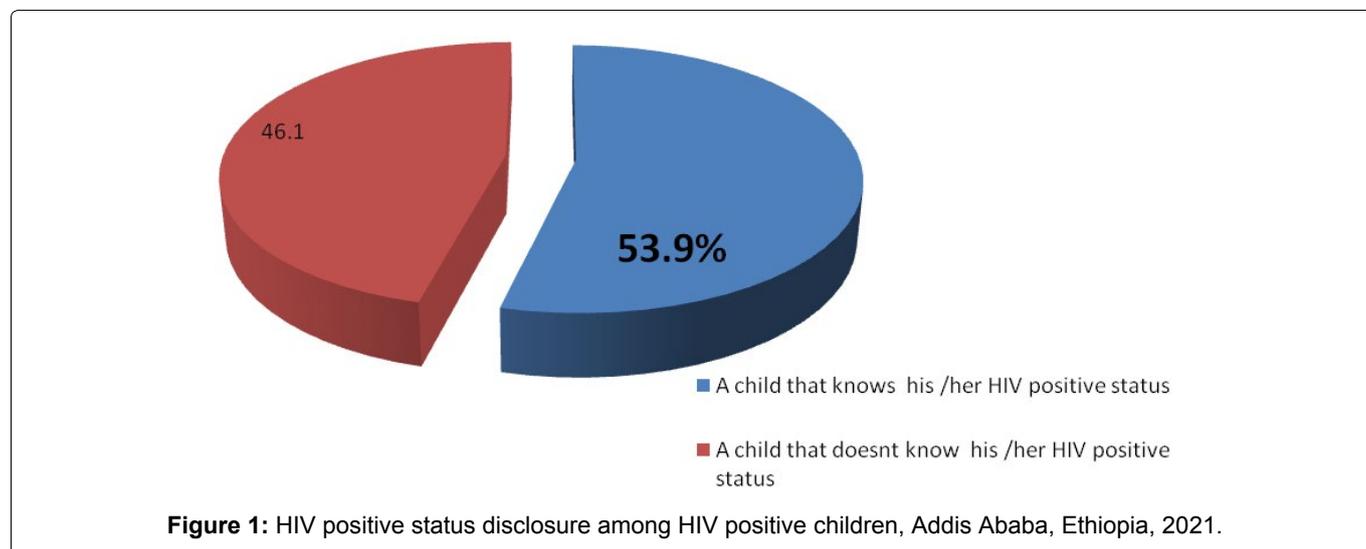


Table 4: HIV positive status disclosure among HIV positive children in AddisAbaba, Ethiopia, 2021.

HIV disclosure		Frequency	Percentage
Does the child know his /her HIV positive status	Yes	167	53.9
	No	143	46.1
If yes, at what age did you disclose?	7-12	135	43.5
	> 12	32	10.3
Who disclosed to the child?	Mother	53	17.1
	Father	43	13.9
	Grand parents	19	6.1
	Relatives	10	3.2
	Health care workers	42	13.5
If you didn't disclose, what you told the child the reason for visiting health facility?	For TB follow up	24	7.7
	For cardiac follow up	67	21.6
	For allergic follow up	14	4.5
	Tell nothing to child	38	12.3
Do you intend to disclose in the future	Yes	132	42.6
	No	11	3.5
The age at which the child should know about his/her HIV status?	< 15	131	42.3
	15-18	64	20.6
	> 18	115	37.1
Who should have the responsibility of disclosing HIV status to the child? (Multiple answer possible)	Mother	46	14.8
	Father	33	10.6
	Grand parents	5	1.6
	Health workers	156	50.3
	Others*	70	22.6
Do you think the child gets stigmatized due to his/her HIV positive status?	Yes	180	58.1
	No	86	27.7
	Others**	44	14.2

Note: Others* - uncle, aunts, siblings and religious fathers; Others** - Sometimes I do and sometimes don't, it depends on the place, I don't know

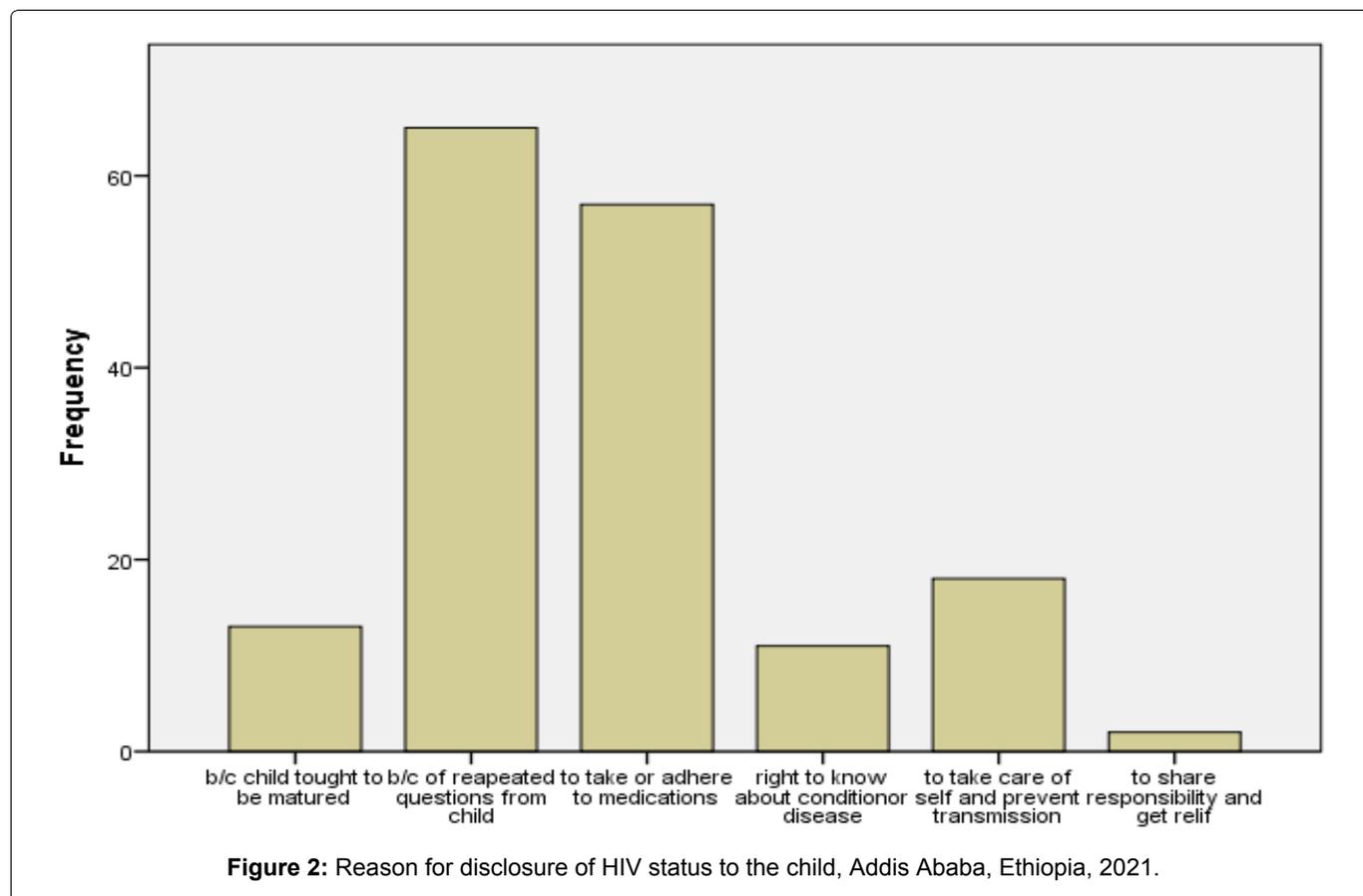


Table 5: Outcome of HIV positive status disclosure on HIV positive children, Addis Ababa, Ethiopia, 2021.

Outcomes of disclosure	Frequency	Percentage	Outcomes of
What was the child's immediate reaction encountered after HIV sero status disclosure?	Crying	24	7.7
	Accepted	65	21
	Depression	16	5.2
	Anger	26	8.4
	Hopelessness	13	4.2
	Others (specify)	8	2.6
How is the child's adherence of medications following HIV sero status disclosure?	Good adherence	114	36.8
	Fair adherence	35	11.3
	poor adherence	3	1
	Others (specify)	15	8.9
What is the child's health condition following HIV status disclosure? (Multiple answers possible)	Increase CD4 count	42	13.5
	Less disease progression	26	7.4
	Decrease CD4 count	8	1
	More disease progression	25	7.4
	No change	66	19.7
What was the child's social relation following HIV sero status disclosure? (Multiple answers possible)	Withdrawal from peers	6	1.9
	Increase relation with caregiver's	21	6.8
	Blaming caregiver's	6	1.9
	Keep secrets	61	19.7
	Tooled to other people	9	1.3
	Felt disclosure was important	31	10
	Took care of him/her self-better	23	7.4
	Chilled being able to protect him/herself and others	10	3.1

What was respondent (caregiver's) concrete feeling following the child HIV status disclosure? (Multiple answers possible)	Relief after disclosure	54	17.4
	Fell not important disclosure	15	4.8
	Disclosure is important and encouraging	88	28.4
	No different feeling	9	2.9
	Others (specify)	1	0.3

Table 6: Factors associated with disclosure of HIV-positive status among care givers to children on highly active anti-retroviral therapy, Addis Ababa, Ethiopia, 2021.

Variables	Categories	Disclosed	Nondisclosure	COR	AOR
Age of the child	6-9	16	76	1	
	10-15	151	67	5.5 (5.111-7.211)	1.5 (3.071-5.256)**
Duration on ART?	1-5	9	37	1	
	6-13	157	105	4.5 (1.075-3.512)	3 (1.093-1.501)*
Treatment adherence of the child?	Very good	140	74	3.9 (2.499-6.116)	2 (1.241-3.487)*
	Fair	25	46		
	Poor	2	23	1	
health care provider adequately covers the issues	Yes	129	83	5.1 (1.997-13.437)	2.1 (5.728-6.527)*
	No	6	20	1	

*Significant at P value < 0.05; **Significant at P value < 0.01

to their children. The initial reaction was acceptance for twenty one percent one hundred fourteen of them had good adherence and sixty-six participants had a no change of CD4 count after disclosure ten percent says their child interaction felt that disclosure was important on and 17.4% had a relieved Feeling after disclosure see details in [Table 5](#).

Factors associated with disclosure of HIV-positive status to infected children were assessed by binary logistic regression. In univariate analysis, the age of the child and the caregivers with whom the children were living, the WHO clinical stage of the child, the age of the child at diagnosis, the duration of ART, the treatment adherence of the child, the disclosure issue with the health care provider, the health care provider adequately covering the disclosure issue, and support from other organizations had p-values less than 0.25, and the variables were selected for multivariable analysis. In multivariable analysis, age of children (AOR) [1.5 (3.071-5.256), duration of ART (AOR) [3.093-1.501], good treatment adherence (AOR) [1.241-3.487], and adequate advice from a health care provider (AOR) [2.1 (5.728-6.527)] were independently associated with disclosure of HIV-positive status to infected children; see details in [Table 6](#).

Discussion

Disclosure has become an essential part of the care for HIV-infected children in antiretroviral therapy clinics. Disseminating HIV positive status to infected children is one of the most difficult psychosocial challenges that parents and caregivers face. The main reason for disclosure was the child's repeated questions, while the

rest disclosed it because the child was thought to be mature enough to: take or adhere to medications; have the right to know about his or her disease condition; take care of him or herself and prevent disease transmission; share responsibility; and get relief. Several studies have shown the importance of disclosing the HIV positive status to children infected with HIV for psychological benefits (facilitating children's adjustment) and positive effects on the clinical course of the disease (increasing adherence to medications, treatment regimens, doctor visits, and hospitalizations) [21]. Despite concerns about the psychological and social consequences of HIV disclosure to children, some studies in developed countries show that HIV-infected children adopt and live well after disclosure, even better than children who are unaware of their HIV status.

The disclosure rate in this study was 53.9 percent. As previously stated, disclosing HIV status to children has several advantages for them. However, due to different factors, caregivers refrain from revealing their status. This study's finding is higher compared with studies done in 2013 and 2014 in northern Ethiopia, which showed a prevalence of 31.5 and 33.3%, respectively [15,18]. In contrast to our findings, low disclosure rates were reported in Kenya (29) and Addis Abeba (17%) in 2012 [18]. The probable reason for the better prevalence of disclosure in this study could be due to the higher number of older primary school-aged children in the study. An increase in awareness might have been created over time as different stakeholders worked on areas to improve the disclosure status. But still, the disclosure in the study area can be greatly improved.

The age of the child was found to be one of the

factors independently associated with HIV-positive status disclosure to infected children. Children aged 10-15 years were approximately one and a half times more likely to be informed of their HIV-positive status than those aged 6 to 9 years. This could be due to the older children repeatedly asking the reason why they were taking medication, or it might be the belief of the caregivers that the older they get, the more mature they will become, leading to better self-care and compliance with the medications given. This finding agreed with studies conducted in central and northwest Ethiopia, where children of the same age were more likely to be disclosed than their counterparts not in school [14,19]. Children in other African countries were more likely to know their HIV diagnosis result as they aged, according to similar findings [23,24].

Another factor associated with HIV status disclosure to children was the length of time on ART. Those children who were on ART from 6 to 13-years-old were about three times more likely to disclose their HIV status than their counterparts. This finding agreed with studies done in developing countries, including Ethiopia [18,19]. The study in Bahir Dar reported that children who had taken ART for more than five years were five times more likely to have their status disclosed [14]. This might be due to the fact that when the children stay on ART for a long period of time, their curiosity about why they are taking the medications will increase, and they will start to ask questions about their HIV medications more and more as time goes by. Another factor associated with the disclosure of HIV status to children was good adherence to treatment. Good adherence not only helps disclosure but also facilitates a good outcome after disclosure. Several studies have shown that disclosing HIV positive status to HIV-infected children has benefits. For instance, a study conducted in Brazil showed positive effects on the clinical course of the disease (increased adherence to medications, treatment regimens, doctor visits, and hospitalizations) [21]. Similar results were also shown in other studies conducted in Ghana and Ethiopia, which showed that the reason caregivers disclose an HIV diagnosis to children, is that HIV serostatus disclosure positively influences adherence to ART for some HIV-positive children. It also enables children to understand HIV infection and to make sense of disease-related experiences and the importance of adherence [25,26]. A good health care provider who provides adequate care was also found to have a positive association with disclosure. HCW play an important role in childcare and in providing psychological support to both the child and the caregiver. So, the more the caregiver and child get adequate care and information from the HCW, the more confidence and reassurance they get to disclose their status to the child. This study had limitations due to clinical characteristics not assessed, social desirability bias, and cross-sectional nature.

Conclusions

The prevalence of HIV-positive status disclosure to infected children in Addis Ababa is a little more than half (53.9%) and has shown an improvement compared to previous findings. Factors such as the age of the child, the duration of ART, good treatment adherence, and adequate advice from a health care provider were all increase the likelihood of disclosure. The main reasons for disclosure were repeated questions from the child, and the main reasons for non-disclosure were caregivers' thoughts that the child couldn't keep a secret, fear of self-discrimination, and the child being too young to handle the information. There is still room for improvement, and health care workers should give age-appropriate counselling and support and work together with caregivers in the process of disclosing their diagnostic results. The prevalence of the disclosure status is a little more than half, and further efforts should be made to increase it.

To do this, caregivers should be informed of their HIV status gradually, health care workers should have training guidelines for disclosing to children, and the Ministry of Health, stakeholders (NGOs), and Administration city health planners and policy makers should give special emphasis to health care institutions.

Additionally, research should be conducted to assess caregiver attitudes and associated factors regarding HIV status disclosure to an HIV-positive child, and additional studies should be done to assess ART service- and program-related factors.

Declarations

Ethics approval and consent to participate

Ethical clearance was obtained from Santé Medical College department of public health, Research ethics Committee. Following approval, an official letter of support was given to the city Administration Health Bureaus, and hospitals. Permission was obtained from each hospital management body. Participants were informed that participation was voluntary and that they could withdraw at any time if they were not comfortable about the questionnaire. Informed consent was obtained from all caregivers and assent was obtained from the age 13-15. Then, the interview was carried out privately in the private room. Names or personal identifiers were included in the questionnaires to ensure anonymity. Furthermore, all the basic principles of human research ethics (respect for persons, beneficence, voluntary participation, confidentiality, and justice) were respected. The respondents also had the right to refuse or terminate at any point in time. The information provided by each respondent was kept confidential. Confidentiality and privacy were ensured at all levels throughout the study by keeping the data and records in safe place.

Finally informed consent was obtained from all subjects and/or their legal guardian(s). The participants were assured that the information given was used only for the study and that confidentiality was to be kept. Authors had confirmed that all methods were carried out in accordance with relevant guidelines and regulations and confirmed that informed consent was obtained from all subjects and/or their legal guardian(s). Authors had confirmed that all experimental protocols were approved by a named institutional and/or licensing committee.

Consent to publish

Not applicable.

Availability of data and materials

Datasets used in the current study are available from the corresponding author upon reasonable request.

Competing interests

Authors declared that they have no competing interest.

Funding

Funding for this study was obtained from Santé Medical Colleges. The college had no role in the design of the study and collection, analysis, and interpretation of data.

Author contributions

YW& DBD, contributed to the conception, design, and conduct of the study, analyzed and interpreted the data, and prepared the manuscript contributed to the conception, design, and conduct of the study, analyzed and interpreted the data, and prepared the manuscript; DBD & YW contributed to the design and conduct of the study, analyzed and interpreted the data, and prepared the manuscript. All authors read and approved the final manuscript.

Acknowledgments

We would like to say thanks to Santé medical college of health science department of Reproductive health for giving me this chance to prepare this thesis and supports it rendered me in accomplishing this thesis. We want to thank my data collector, participant and beloved family, for their support during the whole process of this research. Our heartfelt thanks also go to all Addis Ababa University and their staffs for their cooperation and permission to conduct this study. Moreover, we want to thank all the study participants and the Data collectors for their cooperation and willingness to participate in this study.

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