

The Burden of HIV Stigma and Associated Factors among HIV Infected Adolescents Attending HIV Clinics in Kampala City: A Cross-Sectional Study in Uganda

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Abstract

Background and Aim: The Current HIV/AIDS pandemic is accompanied by undeniable stigma against people living with HIV/AIDS (PLWHA). Most studies on HIV-related stigma have been among adults, and they report that it is a major hindrance to various HIV treatment goals among PLWHA. However, there is scanty literature on HIV-related stigma among adolescents. This study aimed to determine the burden of HIV stigma and associated factors among HIV-infected adolescents in Uganda.

Methods: We conducted a descriptive cross-sectional study among 370 HIV-infected adolescents aged 10-17 years attending HIV clinics in Kampala Capital City Authority (KCCA) health facilities. HIV stigma was assessed using the 11-item Stigma in AIDS Family Inventory (SAFI) tool, depression and suicidal ideation were assessed using the Child Depression Inventory (CDI) tool, while HA ART adherence and social support determined using the missed-dose method and the 12-item Multidimensional Scale of Perceived Social Support (MSPSS) tools respectively. Data was analysed using STATA 16. Logistic regression analyses were used to assess the factors associated with HIV stigma. A $P < 0.05$ was considered statistically significant.

Results: Overall, 370 adolescents, with a mean age of 15.5 years (Standard deviation, SD = 2.88) and a female preponderance (216, 58.4%) participated in this study. The prevalence of high-level HIV stigma was 33.5% (Mean score = 9.53, SD = 6.33). Orphan status (AOR = 1.65, 95% CI = 1.15 - 2.37, $P = 0.007$), Depression (AOR = 1.10, 95%CI = 1.06 - 1.15, $P < 0.0001$), being with suicidal ideation (AOR = 2.48, 95%CI = 1.06-5.81, $P = 0.036$), perceived low social support (AOR = 0.94, 95%CI = 0.91 - 0.97, $P = < 0.0001$), Poor HAART adherence (AOR = 2.12, 95%CI = 1.23 = 3.63, $P = 0.007$), and undisclosed HIV status (AOR = 0.06, 95%CI = 0.01 - 0.42, $P = 0.004$) were independently associated with high HIV stigma.

Conclusion: The prevalence of HIV stigma among adolescents living with HIV/AIDS is substantial. HIV-infected adolescents should be provided with psychosocial counseling, social support, and routine close mental health monitoring to combat psychological stigma which can lead to full-blown psychiatric disorders. This may be better achieved by integrating mental health services into HIV care.

Keywords: Stigma; Prevalence; HIV; Adolescents; Uganda

Abbreviations

PLWHA: People Living with HIV/AIDS; HAART: Highly Active Antiretroviral Therapy; ART: Antiretroviral Therapy; UNAIDS: United Nations Programme on HIV/AIDS; AIDS: Acquired Immune Deficiency Syndrome; HIV: Human Immunodeficiency Virus; NAFOPHANU: National Forum of People Living with HIV/AIDS Networks in Uganda; KCCA: Kampala Capital City Authority; MOH: Ministry of Health; UPHIA: Uganda Population-Based HIV Impact Assessment; HC: Health Centre; SAFI: Stigma in AIDS Family Inventory; CDI: Child Depression Inventory; MSPSS: Multidimensional Scale of Perceived Social Support; STATA: Statistics and Data

Introduction

About 38 million individuals are presently living with HIV worldwide and of these 1.5 million are children under 15 years [1]. Sub-Saharan African countries such as Uganda have the largest burden of pediatric HIV infections in the world [2]. Although the global target had been set for eradication of pediatric HIV by 2020, there are still complex issues facing HIV infected and affected children in the sub-continent [2]. In Uganda, about 1.5 million people are living with HIV, female adolescents and young women being disproportionately affected. In addition, the HIV prevalence among children aged 0 - 14 years is 0.5%, which corresponds to approximately 96,000 children living with HIV [3].

The 2023 UNAIDS report on the progress towards ending HIV among children confirms that despite great progress made since the early days of this epidemic, the HIV response for children has lagged. For instance, whereas 93% of adults LWHA on Highly active antiretroviral therapy (HAART) had achieved viral suppression in 2022, only 81% of children below 15 years had done so, and this is partly due to challenges in retaining children in HIV care [1].

The global AIDS epidemic has been accompanied by a second epidemic of stigma against people living with HIV/AIDS (PLWHA) and their families [4]. Despite the progress in prevention and treatment of HIV/AIDS, HIV-related stigma still impacts the lives of individuals living with HIV [5-7].

Children with HIV infection often grow up in stressful environments with majority acquiring it through mother to child transmission and some encountering stigma as they grow into adolescence [8]. Furthermore, Studies have shown that children living with HIV or children living with PLWHA suffer stigma particularly from the community and are more prone to having psychological problems [9,10]. Children may understand, express, and respond to AIDS-related stigma differently from adults, and children can often stigmatize each other as well [11]. Teachers have observed bullying of AIDS-affected children by other children [12].

In Cambodia, a study by Barennes and colleagues showed that 43.2% of children experienced HIV perceived stigma in form of being rejected by others in participating in different activities including play, lack of integration into their community, and some reported poor adherence and retention in HIV care [6], which is a violation of children's rights. A Kenyan study by Vreeman and others also found that children and their caregivers who experienced HIV stigma also reported anxiety, stress, and depression [13].

In Uganda, stigma has been found to be a key barrier to HIV care programs. In 2015, a survey by HIV support organizations, done in central and south-western Uganda found stigma to be high, where by more than half (54%) of the participants reported to be experiencing some form of discrimination or prejudice as a result of having HIV [14]. Furthermore, the People Living with HIV Stigma Index 2013 found that the most common forms of external stigma and discrimination directed at people living with HIV were gossip (60%), verbal -harassment, insults, and threats (37%) and sexual rejection (21.5%) [15]. However, majority of these studies were conducted among HIV adults, with HIV-infected children not included.

We hypothesized that adolescents infected by HIV/AIDS experience stigma the same way adults do, which may affect their psychosocial functioning. In addition, we hypothesized that the stigma levels would differ by children's chronological age, with the level of stigma increasing with age. Although several studies have reported significant stigma among adolescents world-wide, very few reports about the same topic exist in Uganda. Knowledge of the levels and factors associated with HIV related Stigma can guide better planning and designing of customized interventions among HIV-infected adolescents who are disproportionately affected.

Aim of the Study

In this study therefore, we aimed to determine the burden of HIV stigma and associated factors among HIV-infected adolescents in Uganda.

Materials and Methods

Study design, setting and population

We conducted a descriptive cross-sectional study using quantitative techniques at Kampala Capital City Authority (KCCA) HIV clinics. KCCA is the governing body of Kampala, the capital city of Uganda. It has six (6) health facilities, namely Kiswa Kisenyi, Kawaala, Kisugu, Kitebi and Komamboga, which are either Health Center IV (HC IV), a county-level health facility that serves a catchment population of approximately 100,000 people or at the level of sub-county health facilities that serves a catchment population of about 20,000 people. According to the Uganda's healthcare system, these facilities have the mandate to provide basic preventive, curative, medical and surgical care, including basic laboratory/diagnostic services [16]. All the KCCA health facilities in addition to the general medical care, have an attached HIV clinic which is managed by an ART focal person who is either a medical doctor, clinical officer, or nursing officer. Our target population were the HIV infected adolescents aged 10 - 17 years attending HIV treatment program from any of the KCCA health facility HIV clinics mentioned above. We applied the Kish and Leslie formula, using the prevalence of 41% in Ashaba and colleagues' study [17] and came up with a sample size of 371.

Study procedure

The data collection was done from mid-April to end of August 2022. The inclusion criteria required HIV-infected adolescents aged 10 - 17 years old, who had known their HIV positive sero-status for a period of not less than 6 months and had been in HIV care for at least 12 months prior to this study. HIV infected adolescents with stigmatizing illnesses like Tuberculosis, Epilepsy, Herpes Zoster scar, physical disability, and those too sick to participate in the study were excluded. The actual data collection was done by psychiatric nurses and medical officers working in Uganda's national mental health referral hospital. Participants were selected using consecutive sampling method, and these were recruited every five days a week for 18 weeks. The trained research assistants worked hand in hand with primary HIV care providers at the treatment center to obtain clients that had registered on a particular HIV clinic day. As clients would be waiting to be seen by their HIV care provider, research assistants approached them, explained the research study procedures, determined eligibility, and administered the study questionnaires to the adolescents who provided assent and whose corresponding parents/caregivers/appointed staff provided informed consent.

Study measures

Outcome variable

HIV associated stigma was our main outcome variable. It was assessed using an 11-item Stigma in AIDS Family Inventory (SAFI) tool by Vreeman and colleagues [13]. The SAFI Stigma questionnaire asks a series of questions regarding the stigma and discrimination that an individual experienced because of his/her own or someone in their families' HIV status. Participants were instructed to respond to an experience as having "never happened" or "ever happened". If "ever happened" was chosen, the participant would further be requested to describe the time frame in which the experience happened, categorized as either in the "past 6 months" or "longer than 6 months ago."

Predictor variables

We used a socio-demographic questionnaire to obtain participants descriptive characteristics including their age, gender, highest education level attained, and the orphan status. The level of education attained was further sub-classified into “No formal education attained”, “pre-primary”, “primary”, and “Secondary”. Orphan state was classified into “Orphan” and “Not orphan”. The next part of this questionnaire inquired about a participant’s experiences in terms of having had history of suicidal ideations in the recent one month, substance use in the recent month, and the state of their HIV-positive status disclosure. For each of these questions, participants were required to reply with closed-ended answers of either a “YES” or a “NO”.

Child mental health variables

Depression

This was assessed using the Child Depression Inventory (CDI) tool by Kovacs [18]. The CDI assessment tool comprises of 27 items rated on a 3-point scale [0 (none) to 2 (distinct symptom)]. Total CDI scores range from 0 to 54 with several recommended clinical cut-off scores (e.g. > 13; 13-18; ≥ 19) to indicate elevated depressive symptoms in youth [18]. In our study, participants who scored > 13 points were regarded as having significant depression symptoms.

Perceived social support

Perceived social support was assessed using the 12-item Multidimensional Scale of Perceived Social Support (MSPSS) [19]. This scale was adapted from Nakigudde and others [20]. The MSPSS scale subjectively measures perceived social support using three subscales namely: Family subscale, Friends subscale and Significant Others subscale. Each of the three subscales has four items rated on a five-point Likert scale that ranges from 1- of strongly disagree, 2- mildly disagree, 3- neutral, 4- mildly agree to 5- strongly agree.

Clinical variables

We reviewed participant’s medical records (files) to determine their baseline WHO HIV stage prior to HAART initiation as well as their adherence to HAART. Adherence to HAART was assessed by using the missed-dose method, whereby participants were asked to report the number of missed doses within a specified period (In a week, how many days did you miss to take pills?). This was also verified with the participant’s care giver.

Ethics approval and informed consent

The study protocol obtained institutional ethical approval from the Mengo Hospital research ethics committee (MHREC), study number MH-2021-18 and administrative clearance from Kampala Capital City Authority (KCCA). Assent was obtained from the adolescents and written informed consent was obtained from their respective primary care givers. Individuals who could not read and write signified their consent by use of a fingerprint accompanied by a signature by one of their own chosen witnesses. It is important to note that six 17-year-old adolescents were heading their own families (child headed families). Under the Uganda National Council of Science and Technology, these are regarded as emancipated minors and are allowed to give consent. Overall, the study was carried out in accordance with the declaration of Helsinki.

Data management and analysis

Data was analyzed using STATA version 16. The aim of data analysis was to determine the prevalence of stigma among HIV-infected adolescents, and which demographical, psychosocial, and clinical factors were associated with high-levels of HIV stigma in this population. Descriptive analysis was used to summarize categorical variables as frequencies and percentages, while continuous variables as means and standard deviation. Stigma (primary outcome) was considered as a continuous variable, and we calculated the total stigma score, from which we got the mean stigma score of the study sample. This was taken as a cut off, whereby those that scored below the mean were regarded as having low stigma, while those that had a score greater than the mean were regarded as having high stigma.

Inferential analyses (Logistic regression) were conducted to determine the factors associated with high levels of stigma. Initially, a binary variable was created for stigma, with the variable coded 1, (high levels of stigma) and coded 0, (low levels of stigma). Simple logistic regression was used to evaluate associations between Stigma and other study variables. Variables significant at P-value ≤ 0.20 at bivariate analysis, were considered in the final multiple logistic regression analysis.

In the final multivariate logistic regression analysis, we used both forward and backward stepwise regression. Variables with a p-value ≤ 0.05 at a 95% confidence interval were regarded as statistically significant and, hence considered to be independently associated with high Stigma.

Results

Characteristics of study participants

We enrolled a total of 370 Participants. Their age ranged from 10 to 17 years, with a mean age of 15.5 years (SD = 2.88), and the majority of them (216, 58.4%) were female. One-hundred sixty-three (44.05%) participants were orphans. Most participants (304, 82.16%) had attained some formal education, with a secondary level of education having the highest number (150, 40.54%) of participants. Ninety-six (25.95%) had HIV clinical stages III and IV prior to ART initiation. Two-hundred fifty-two participants (68.11%) had a good adherence to HAART. The mean duration of being on HAART among participants was 109.02 months (SD = 52.74).

The prevalence of high levels of HIV stigma among participants was 33.5%, with a stigma mean score of 9.53 (SD = 6.33). The depression mean score among study participants was 8.63 (SD = 7.39), with the prevalence of Depression at 20.3%, and the Multidimensional Scale of Perceived Social Support (MSPSS) mean score of 37.56 (SD = 8.83). Table 1 shows detailed Socio-demographic and clinical characteristics of the study participants.

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	154	41.62
Female	216	58.38
Child status		
Not orphan	207	55.95
Single orphan	119	32.16
Double orphan	44	11.89
Highest level of education		
No formal Education	66	17.84
Pre-primary	09	2.43
Primary	145	39.19
Secondary	150	40.54
History of suicidal ideation in the recent month		
Yes	38	10.27
No	332	89.73
History of substance use in the recent month		
Yes	34	19.19
No	336	90.80
Adolescent HIV status disclosure		
Yes	364	98.38
No	06	1.62

WHO HIV stage before starting ART		
Stage 1	207	55.95
Stage 2	67	18.11
Stage 3	70	18.92
Stage 4	26	07.03
Adherence to HAART		
≥ 85% (Adherent)	252	68.11
< 85% (non-adherent)	118	31.89
Viral load within the last 12 months		
Missing/ Not done	348	94.05
Detected	16	4.32
Not detected	06	1.62
Family history of mental illness		
Yes	63	17.03
No	307	82.97
Stigma level		
High	124	33.51
Low	246	66.49
Depression		
Yes	75	20.27
No	295	79.73

Table 1: Socio-demographic and clinical characteristics of study participants (N = 370).

Factors associated with high levels of HIV stigma among HIV -infected adolescents

Socio-demographic factors

At bivariate analysis, the orphan status and adolescent HIV disclosure status were the only demographic variables associated with HIV stigma; (P < 0.0001) and (P = 0.084) respectively. Participants who were orphaned were more likely to report high levels of HIV stigma compared to those who were not orphaned, while those who had disclosed their HIV status were less likely to report high levels of stigma. These associations maintained their significance even at multi-variate analysis. Orphan status (AOR = 1.65, 95% CI = 1.5 - 2.37, P = 0.007) and HIV status disclosure (AOR = 0.06, 95% CI = 0.01 - 0.42, P = 0.004). Other demographic variables: age, gender, and education level did not show any association with high levels of HIV stigma at both bivariate and multivariate analyses.

Psycho-social characteristics

Participants who had depression (P < 0.0001), history of suicidal ideation (P = 0.002), and substance use (P = 0.037) were more likely to report high levels of HIV stigma compared to their respective counterparts, while those with perceived good social support (P < 0.0001) were less likely to report high levels of HIV stigma at bivariate analysis (Table 2a and 2b). At multivariate regression analysis, depression (AOR = 1.10, 95% CI = 1.06 to 1.15, P < 0.0001), suicidal ideation (AOR = 2.48, 95% CI = 1.06 to 5.81, P = 0.036), and perceived low social support (AOR = 0.94, 95% CI = 0.91 to 0.97, P < 0.0001) were still significantly associated with high levels of HIV stigma (Table 3).

Clinical variables

At bivariate analysis, HIV -infected adolescents who initiated HAART while in later stages of WHO HIV disease (stages III and IV) were more likely to report high levels of HIV stigma than their colleagues who initiated HAART while still at earlier WHO HIV disease stages

Characteristic	Low stigma (N = 246) Mean (SD)	High stigma (N = 124) Mean (SD)	Mean difference (95% CI)	P-value
Age	15.59 (2.92)	15.43 (2.80)	0.16 (-0.46 - 0.79)	0.610
Perceived social support	39.93 (7.55)	32.84 (9.31)	7.10 (5.32 - 8.87)	0.000
Depression	6.40 (5.02)	13.05 (9.17)	-6.65 (-8.10 - 5.20)	0.000
Duration on HAART	111.31 (54.10)	104.49 (49.83)	6.82 (-4.60 - 18.23)	0.241
Opportunistic infections	2.38 (2.02)	2.44 (2.06)	-0.06 (-0.509 - 0.38)	0.798

Table 2a: Bivariate analysis of factors associated with high levels of HIV stigma among HIV -infected adolescents (N = 370).

Characteristic	Low stigma (N = 246) n (%)	High stigma (N = 124) n (%)	Chi-square value	P value
Gender				
Female	147 (59.76)	69 (55.65)	0.573	0.503
Male	99 (40.24)	55 (44.35)		
Education			2.631	0.429
No formal education	39 (15.85)	27 (21.77)		
Pre-primary	5 (2.03)	4 (3.23)		
Primary	99 (40.24)	46 (37.10)		
Secondary	103 (41.86)	47 (37.90)		
Child status			18.194	0.000
Not orphan	154 (62.60)	53 (42.74)		
Orphan	92 (37.40)	71 (57.26)		
Adolescent HIV status disclosure			2.988	0.084
Yes	244 (98.18)	120 (96.77)		
No	2 (0.82)	4 (3.23)		
Psycho-social characteristic			11.298	0.002
History of suicidal ideation				
Yes	16 (6.50)	22 (17.74)		
No	230 (93.50)	102 (82.26)		
History of substance use			4.567	0.037
Yes	17 (6.91)	17 (13.71)		
No	229 (93.09)	107 (86.2)		
Clinical characteristics			8.895	0.030
WHO HIV disease stage				
Early (I and II)	176 (71.54)	98 (79.03)		
Late (III and IV)	70 (28.46)	26 (20.97)		
Adherence to HAART			11.667	0.001
Adherent	182 (73.98)	70 (56.45)		
Non-adherent	64 (26.02)	54 (43.55)		

Table 2b: Factors associated with high levels of HIV stigma among HIV infected adolescents at bivariate analysis (N = 370).

(I and II) ($P = 0.030$) (Table 2b). Similarly, those with poor HAART adherence were more likely to report high levels of HIV stigma ($P = 0.001$) compared to those with good HAART adherence. However, at multi-variate analysis, only the poor HAART adherence remained significantly associated with high-level HIV stigma (AOR = 2.12, 95% CI = 1.23 to 3.65, $P = 0.007$) (Table 3). Table 3 summarizes the factors independently associated with High levels of HIV stigma among HIV- infected adolescents at multivariate analysis.

Characteristic	Adjusted Odds Ratio (AOR)	95% CI	P value
Orphan status	1.65	1.15-2.37	0.007
Depression	1.10	1.06-1.15	0.000
Suicidal ideation	2.48	1.06-5.81	0.036
Perceived social support	0.94	0.91-0.97	0.000
Adherence to HAART	2.12	1.23-3.65	0.007
HIV Disclosure status	0.06	0.01-0.42	0.004

Table 3: Multivariate logistic model. Independent factors associated with high levels of stigma among HIV infected adolescents ($N = 370$).

Discussion

In this study, our main outcomes were: 1) The prevalence of high-level HIV stigma among HIV -infected adolescents was 33.5%, 2) The prevalence of depression and suicidal ideations was at 20.3% and 10.3% respectively. The mean score of perceived social support among participants was relatively low at 37.57. 3) The main factors associated with HIV stigma include being orphaned, depressed, with suicidal ideations, poor social support, undisclosed HIV status, and poor HAART adherence.

The high-level HIV stigma reported in this study is substantial, and this comparably correlates with the 32% reported in a similar age group (10 - 17 years) of participants by Surkan and colleagues in Haiti [21] and the 34% reported by a national survey among adults in Uganda [22]. However, this finding is quite lower than the one reported by Ashaba and others (41%) among adolescents in south-western Uganda; a similar setting [17], the 42% among HIV-infected adolescents in Tanzania [23] and the 48.4% in Nigeria [24]. The difference could be due to the variation in the stigma assessment scales used, for example, whereas we used the 11-item stigma in AIDS family inventory (SAFI) tool, Ashaba, *et al.* used the 6-item internalized AIDS-related stigma assessment tool while the other two studies in Tanzania and Nigeria both used the 16-item Berger stigma assessment tool, hence a possible source of these inconsistencies. Secondly, it could also be due to the differences in the study sites and settings. For instance, our study was done within Kampala- the capital of Uganda, whereas the studies by Ashaba, Dow, and Ogunyemi above were all done from sites located over 200km from the respective country's capital. Such areas with relatively lower population density and less development have been found to harbour higher levels of HIV stigma compared to their counterparts with more development and higher population densities (city-settings) within the same country [25,26]. Lastly, the studies in Tanzania and Nigeria were carried out on a relatively bigger age span (12 - 24 and 15 - 24 years respectively) involving more adults, who could be more susceptible to being stigmatised compared to adolescents.

Noteworthy still, our finding is slightly higher than that reported among adolescents of a similar age group in South Africa, where the prevalence was 26.5% [27]. This may obviously not be surprising however, since South Africa is one of the top countries with the highest HIV burden, and evidence has shown that areas with higher HIV prevalence are usually associated with lower HIV-related stigma compared to those with lower HIV Prevalence [28]. This could be due to learning by habituation over time as people get more exposed to and interact with PLWHA in different aspects of their daily lives.

The level of Depression reported in our study correlates with the one reported by Ashaba and colleagues (16%) among HIV- infected adolescents in Western Uganda [17]. However, the current depression level is far lower than the 40.8% reported by Musisi and others [14]

years ago in the same country, which was twice bigger than the current figure [29], as well as the 36% observed among newly diagnosed men who have sex with fellow men in China [30]. This significant positive change in Uganda is commendable and could be attributed to the different evidence-based interventions that target the reduction of mental illnesses associated with HIV/AIDS since this HIV pandemic began like the implementation of group support psychotherapy that has been used in treating depression and improving adherence in people with HIV/AIDS in Uganda [31] and such work should continue for better quality of life among PLWHA.

The suicidal ideation level found in this study is comparable to the 8.8% reported by Rukundo and colleagues in south-western Uganda seven years ago [32]. However, it is lower than the 17.1% observed by Musisi, *et al.* in Central Uganda fourteen years ago [29], the 17.0% reported by Ashaba and colleagues in south-western Uganda five years ago [17], as well as the 17% we recently reported in one of our studies in a similar setting and population [33]. This mirrors a picture of oscillatory levels of suicidal ideation among HIV-infected children and adolescents in our setting, which requires further comprehensive analysis to check for the actual gaps causing this inconsistency so that an appropriate and effective intervention is implemented to curb this public health problem in this target population.

Comparably though, this suicidal ideation level is by far lower than the 31.6% reported among HIV infected people in China [10,34] and the 33.6% in Ethiopia [35]. This variation might be due to the difference in the populations studied. For instance, all the latter studies were among adults who were 18 years and above whereas ours was among those 10 - 17 years old. The higher prevalence among adults could be attributed to the added challenges of self-responsibility and care for others that come along with adulthood, for example the obligation to cater for one's daily food, accommodation as well as their dependants' school fees and other basic needs, which can easily make one develop a feeling of worthlessness in case they first struggle so much or completely fail to meet such needs, hence suicidal thoughts unlike adolescents, majority of whom are usually still under their parents or guardians care [34].

Like several other previously reported findings [17,35], our study re-emphasises the strong association between depression and suicidal ideation with HIV-related stigma. This is further supported by other studies that have found depression to be independently associated with HIV-related stigma [27,30,37,38]. In particular, depression has been found to potentiate the manifestation of other mental disorders. For example, in their model analysis, Wei and others found that suicidal ideation was not directly associated with HIV stigma but required an underlying depression mediator to manifest [39].

We also report that being orphaned is associated with high HIV-related stigma levels. This finding is consistent with that reported previously among Ugandan Orphan youths [40] who reported significant cultural-specific stigma distinctly related to their HIV orphan status. Similar findings have been observed in South Africa [41], Rwanda [42] and from another four-year cohort study done among South African youths, which showed that HIV-Orphaned youths reported higher levels of stigma right from the start up to the end of the study than the youths not orphaned by HIV [43].

Our study showed that social support is a protective factor, and therefore mitigates the HIV associated stigma faced by the HIV-infected adolescents. This still concurs with results from previous studies which reported a high protective function of good social support from HIV stigma [8] and depression [44] among Ugandan adolescents. Additionally, we found that adolescent disclosure of their HIV status was protective against experiencing stigma, and this is like findings by Nabunya and colleagues [8]. This implies that HIV health care providers should work closely with close adolescent family members to support and facilitate the adolescents in disclosing their HIV status in order to mitigate HIV associated stigma.

Importantly, we discovered that participants with poor HAART adherence were two-times more likely to report stigma than those with good HAART adherence. This was a somewhat expected finding as previous studies from other parts of the world like Nigeria [45], Ethiopia

[45] and America [46] among others [48,49] reported a similar relationship. Fewer studies have elaborated the actual relationship between HIV-related Stigma and poor HAART adherence. In their systematic analysis however, Sweeney and colleagues explain that this stigma-poor HAART adherence relationship is mediated through three main causal pathways which include (I) vulnerability to mental health difficulties such as depression, (II) Reduction in self-efficacy for medication taking, and (III) The concerns about inadvertent disclosure of HIV status among HIV-infected people [48]. This proposed explanation is further supported by that reported from two independent cross-sectional studies in America which also reported fear of Negative evaluation, attachment related anxiety, and resilience as the major mediators between HIV stigma and poor HAART adherence [50]. However, this finding differs from that reported among caregivers of HIV-infected children in Malawi which found no significant association between HIV-related stigma with ART adherence [51].

To our surprise, age was not associated with stigma as we had hypothesised in this study, and this is similar to findings by Small and others still in Uganda [52], but contrary to findings from Ethiopia and China, which reported a strong association between age and stigma [26,53].

Study Limitations

While interpreting our findings, a few limitations may be considered. First, this was a cross-sectional study and we therefore cannot report the causal relationships of the associations we found. Secondly, the social desirability and recall bias among participants might have affected their response answers.

Clinical Implications

This study emphasizes the substantial burden of HIV- stigma among adolescents living with HIV/AIDS in Uganda, which is a major risk factor for depression and poor adherence to ART, this has also been evidently documented to result in poor HIV treatment outcomes. It also identifies and characterizes adolescents with HIV/AIDS who are at greater risk for HIV-stigma. It also shows that social support from family, friends, or any person significant in the adolescent life is vital to mitigate stigma.

This implies that HIV healthcare providers should holistically assess for HIV-stigma in children who have poor adherence to ART so that appropriate interventions including early referral for mental health services are implemented.

Conclusion

The prevalence of HIV-related high levels of Stigma was substantial among HIV- infected adolescents in Uganda. Adolescents who are orphaned, and those who report high depression scores, suicidal ideation, and poor adherence to HAART are more likely to report high levels of HIV stigma. While those with perceived high social support and disclosed HIV status were protective of experiencing high levels of stigma.

HIV-infected adolescents should be provided with psychosocial counselling and social support, followed by monitoring of their mental health over time to combat psychological stigma which can lead to full-blown psychiatric disorders. HIV-infected adolescents that are non-adherent to ART should be assessed for stigma and emotional problems, hence this requires the integration of mental health services into HIV care.

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Conflict of Interest

The authors declare that there is no conflict of interest.

Data Availability Statement

The raw data supporting the conclusions of this article will be made available without undue reservation upon formal request to the corresponding author.

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Author Contributions

JDN participated in research design and data interpretation, drafted work, and major contributor to writing the manuscript. JN-substantive research supervision and revising manuscript. NN-substantive research supervision and revising the manuscript. BK-substantive research supervision and revising manuscript. ENM- Data analysis and interpretation and revising manuscript. MM-substantive research supervision and revising manuscript. FS-substantive research supervision and revising manuscript. All authors read and approved the final manuscript.

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