

Determinants of Sexual Activity among HIV-Infected Adolescents in Cameroon

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Abstract

Introduction: Adolescence is a period of transition to adulthood, including for HIV-infected adolescents (HIA), when sexual problems emerge. Few studies have been carried out on the sexuality of HIA. This study aimed to assess the sexual behavior of HIV-infected adolescents in Cameroon. **Methodology:** A cross-sectional study was conducted in three hospitals in the cities of Yaoundé and Douala, from November 2019 to June 2020. All HIA aged 13 to 19 years followed in the study who knew their HIV status were included in the study after obtaining their assent and their parent's consent. Socio-demographic and clinical characteristics were collected, as well as sexual practices and the determinants of their sexual activity. A multivariate analysis was performed to explore the relationship between the different variables studied and the sexual activity of these adolescents. **Results:** Of 204 HIA enrolled in the study, 64 (31.7%) were sexually active, the mean age at first sexual intercourse was 15.6 ± 2.8 years and the sex ratio was 0.94. Of the adolescents in the study, 75.7% of girls and 61.2% of boys had regular sexual activity, while 21.3% of girls and 35.4% of boys had multiple sexual relationships in the six months preceding the study. Nearly 16 (25.0%) of the sexually active HIA had more than 2 sexual encounters per month, 6 (9.3%) of these encounters had been paid for and 9 (27.2%) of the girls had already had at least one pregnancy. More than 7 out of 10 HIA (79.6%) had used a condom the last time they had sex. Age less than 18

years [OR = 11.1 (95% CI: 3.1 - 39.4), $p = 0.001$], lack of remuneration [OR = 9.8 (95% CI: 2.0 - 47.4), $p = 0.001$] and self-care were significantly associated with sexual activity in HIA, while school attendance was a protective factor. Self-funded HIAs were 21 times more likely to be sexually active [OR = 21.6 (95% CI: 2.3 - 179), $p = 0.004$]. **Conclusion:** More than a third of HIV-infected adolescents were sexually active and risky sexual practices were not negligible.

Keywords

HIV, Adolescent, Sexual Behavior, Cameroon

1. Introduction

Worldwide, around 1.65 million adolescents aged between 10 and 19 were HIV-infected in 2022, accounting for 4% of people living with HIV (PLHIV) and 10% of new HIV infections among adults. Around 1.40 million (85%) live in sub-Saharan Africa. Globally, in 2022, adolescent girls accounted for 4/5 of all new HIV infections among adolescents worldwide, with almost six times as many adolescent girls newly HIV-infected in sub-Saharan Africa [1].

Cameroon is the second most affected country in Central and West Africa by the HIV/AIDS epidemic, with 29,000 infected adolescents and a high rate of mother-to-child transmission of HIV (MTCT-HIV) estimated at 17% in 2022 according to UNAIDS [2] [3]. Access to antiretroviral treatment (ART) for AIDS has improved the survival of HIV-infected children and enabled them to reach adolescence, including those who contracted the disease through risky sexual activity.

Adolescence is a period of transition marked by physical and psychological changes linked to rapid brain development and influenced by individual, social, family and environmental factors [4]. This period exposes adolescents to risky behaviors for their health, including their sexual and reproductive health (SRH) [5]. SRH encompasses the dimensions of people's physical, emotional, mental and social well-being in relation to their sexuality. It means that people should be able to have a satisfying and safe sex life, with the ability and freedom to choose whether and when to have children [6] [7]. An international survey shows that 11% of girls/boys (in developing countries) and 22% of girls (in Latin America and the Caribbean) aged between 15 and 19 have had their first sexual intercourse before the age of 15 [8]. Similarly, the United Nations Population Fund (UNFPA)'s 2014 and 2016 State of the World Population reports state respectively that 50% of young Cameroonians aged 15 to 19 and 60% of adolescent girls under 18 have already had sexual intercourse [9] [10]. A Zambian study conducted in 2018 on HIV-infected adolescents (HIA) found that 20.6% of those aged 15 to 19 had already had sexual intercourse [11], compared with a proportion of 11% among a group of adolescents of the same age in a study conducted in Zimbabwe in 2019 [12]. However, the case of Cameroonian HIA remains unresolved, owing to the lack of substantial literature on the subject.

In addition to the problems usually encountered at this stage of development, HIAs face the challenge of accepting their status and adopting safe sexual behaviors that could have consequences for their health and that of others. Our study aimed to characterize sexual behavior among HIA in Cameroon.

2. Methods

2.1. Study Design and Study Population

A cross-sectional study was conducted from November 2019 to June 2020 in 3 pediatric HIV care centers in Cameroon: Mother and Child Centre of the Chantal Biya Foundation in Yaoundé (MCC/CBF), Laquintinie Hospital in Douala (LHD), Yaoundé University Hospital (YUH). HIV-infected adolescents aged 13 to 19 years who knew their HIV status and were on ART were included voluntarily, and without remuneration after obtaining consent by the child's parent or legal guardian. Sexual activity was defined as genital contact and/or anal or vaginal penetration between one or more individuals.

Assuming an estimated prevalence of sexual activity among HIV-infected adolescents of 15.1% in Zambia, based on data from a study carried out in a context similar to that of Cameroon [13], the minimum sample size was 197 adolescents using the Cochrane formula [14].

2.2. Recruitment of Participants

Once the administrative authorizations had been obtained, we went to the various health facilities in Yaoundé and Douala selected for the study, more specifically to the day hospital unit, where we went to meet the adolescent's accompanying guardians. When the adolescent was accompanied by a parent or an older person, we would first talk to the latter to explain what the study consisted of and obtain his or her informed consent. Once this had been obtained, we spoke with the adolescent in complete confidentiality, and the same procedure was adopted for unaccompanied adolescents, once we had obtained their consent. After introducing ourselves, we explained the purpose and benefits of the study in a separate room for greater calm and confidentiality. For their comfort, they were allowed to ask all the questions and concerns they had about the survey and what would happen to the information they gave us, and appropriate answers were provided before entering into the actual interview, guided by a questionnaire.

2.3. Data Collection

We held individual interviews lasting around 40 minutes with each teenager, during which we collected information that we recorded on pre-designed questionnaire forms. These included socio-demographic data, history of HIV and medical history, source of education on sexuality, feelings about HIV status in relation to sexuality, sexual practices, and reasons for abstinence and the adolescents' romantic plans. Most of the time, the interviews ended with counseling on the right

attitudes and practices to adopt to best manage life with HIV infection, especially when the need arose.

2.4. Statistical Analysis of Data

The quantitative variables were described by their means and standard deviations, and the proportions were calculated for the qualitative variables using Microsoft Excel 2013 and Epi Info version 7.1 software. Logistic regression was used to identify factors associated with sexual activity. The significance threshold was assessed with an alpha risk of 5%.

2.5. Ethical Consideration

This study was conducted following ethics directives related to research on humans in Cameroon. The study received ethical clearance from the Institutional Committee of Ethics for Research for Human Health of the University of Yaoundé I (No. 121/UY1/FMSB/VDRC/DAASR/CSD and, an administrative agreement was obtained from the heads of three health facilities.

Before enrollment and administration of the questionnaire, subjects were informed of the purpose and process of the survey (context, objectives, methodology, study constraints, data confidentiality and rights of withdrawal from the study). The Adolescents' assent was also obtained according to national recommendations before inclusion in the study and signed informed consent were obtained from the adolescents' parents/guardians in accordance with the Declaration of Helsinki. All patients were treated free of charge in accordance with the therapeutic guidelines of the Cameroonian National HIV Program. The data for this work were collected, stored and processed in complete confidentiality, with a unique anonymity number assigned to each questionnaire before data collection.

3. Results

A total of 296 HIV-infected adolescents aged 13 to 19 years were approached in 3 hospitals selected by convenience to participate in the study and 240 were eligible, of whom 36 subsequently withdrew. 204 (85%) adolescents were included (**Figure 1**).

3.1. Socio-Demographic Characteristics of the Study Population

Of 204 HIAs, 113 (55.4%) were female and the sex ratio was 0.81. The mean age was 16.8 ± 1.8 years and 172 (84.3%) were over 15 years old. The number of sexually active HIV-infected adolescents was 64 (31.4%) and 51.6% were girls. Schooling was effective in 187 (91.6%) HIA. Of the 64 adolescents that were sexually active, 58/64 (90.6%) had a primary or secondary level of education. More than half of them, 118 (57.8%) belonged to an association of young people living with HIV (AYPLHIV). Concerning parental survival, 127 (62.3%) HIA were orphans of one or both living parents (**Table 1**).

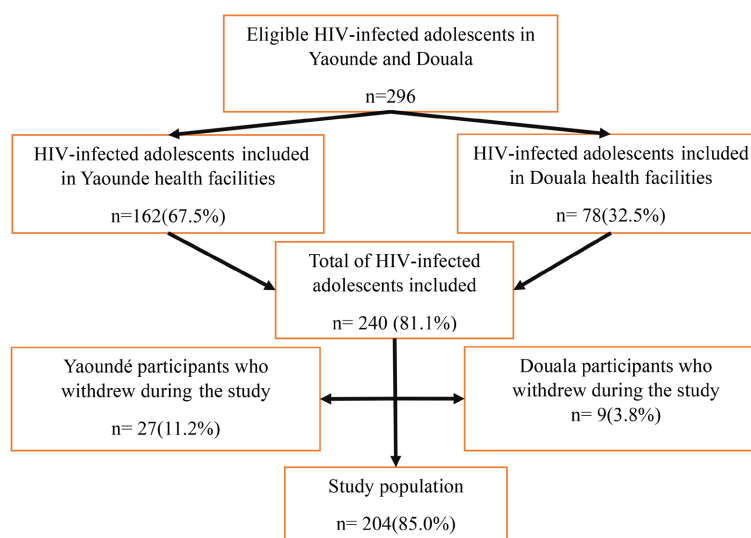


Figure 1. Flow diagram of the inclusion of the study population.

Table 1. Socio-demographic characteristics of the study population according to gender and sexual activity.

Variables	Sexually active (N = 64)		Abstinent (N = 140)		Total n (%)
	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	
Age (years)					
[13 - 15]	1 (1.6)	2 (3.1)	17 (12.1)	12 (8.6)	32 (15.7)
[15 - 17]	6 (9.4)	10 (15.6)	38 (27.1)	34 (24.3)	88 (43.1)
[18 - 19]	26 (40.6)	19 (29.7)	25 (17.9)	14 (10.0)	84 (41.2)
Schooling					
Yes	26 (40.6)	27 (42.2)	77 (55.0)	57 (40.8)	187 (91.7)
No	7 (10.9)	4 (6.3)	3 (2.1)	3 (2.1)	17 (8.3)
Level of education					
Primary	0 (0.0)	1 (1.6)	6 (4.6)	4 (2.8)	11(5.4)
Secondary	30 (46.9)	27 (42.1)	70 (50.0)	50 (35.7)	177 (86.8)
University	3 (4.7)	3 (4.7)	4 (2.8)	6 (4.3)	16 (7.8)
Residence					
Urban	24 (37.5)	29 (45.3)	63 (45.0)	51 (36.4)	167 (81.9)
Rural	9 (14.0)	2 (3.1)	17 (12.1)	9 (6.4)	37 (18.1)
Profession					
Student	23 (35.9)	21 (32.8)	73 (52.1)	51 (36.4)	168 (82.4)
University student	3 (4.7)	3 (4.7)	4 (2.0)	6 (4.3)	16 (7.8)
Unemployed	4 (6.3)	2 (3.1)	3 (2.1)	1 (0.7)	10 (4.9)
Informal	3 (4.7)	5 (7.8)	0(0.0)	2 (1.4)	10 (4.9)
Membership of an AYPLHIV					
Yes	22 (34.4)	21 (32.8)	43 (30.7)	32 (22.8)	118 (57.8)
No	11 (17.2)	10 (15.6)	37 (26.4)	28 (20.0)	86 (42.2)

Continued

Parental survival					
Normal family	11 (17.2)	9 (14.1)	28 (20.0)	29 (20.7)	77 (37.7)
Motherless	4 (6.3)	13 (20.3)	30 (21.4)	11 (7.8)	58 (28.4)
Fatherless	6 (9.4)	5 (7.8)	12 (8.6)	7 (5.0)	30 (14.7)
Double orphan	12 (18.7)	4 (6.3)	10 (7.1)	13 (9.3)	39 (19.2)
Responsible of HIA					
Oneself	2 (3.1)	6 (9.4)	1 (0.7)	0 (0.0)	9 (4.4)
Parent(s)	16 (25.0)	17 (26.6)	47 (33.6)	42 (30.0)	122 (59.8)
Guardian	15 (23.4)	8 (12.5)	32 (22.8)	18 (12.8)	73 (35.8)

AYPLHIV: association of young people living with HIV; **HIA:** HIV-infected Adolescents.

3.2. Sexuality in HIV-Infected Adolescents

Among sexually active adolescents, 10.0% of girls and 41.9% of boys had their first sexual intercourse before the age of 15, and the average age at first intercourse was 15.6 ± 2.8 years. The rate of regular sexual intercourse was 75.7% and 61.2% for girls and boys respectively, while 92.1% of them knew their status at the time of their last sexual intercourse. More than 8 out of 10 adolescent girls (81.8%) and 7 out of 10 adolescent boys (77.4%) had used a condom during their last sexual encounter. Nearly 18 (28.1%) had several sexual partners during the six months preceding the study, including 21.3% of girls and 35.4% of boys. Of the sexually active HIA, 3/4 had more than two sexual relations per month. Among the sexually active HIA 6 (9.3%) had paid sex and 9 (27.2%) of the girls had already had at least one pregnancy (**Table 2**).

Table 2. Specific characteristics of sexual activity of HIV-infected adolescents.

Variables	Girls n = 33 (%)	Boys n = 31 (%)	Total n (%)
Age at first sexual intercourse (years)			
< 15	3 (10.0)	13 (41.9)	16 (25.0)
≥ 15	30 (90.0)	18 (58.1)	48 (75.0)
Regular sexual intercourse	25 (75.7)	19 (61.2)	44 (68.7)
Known HIV status at last sexual intercourse	31 (93.9)	28 (90.3)	59 (92.1)
Condom use at last sexual intercourse	27 (81.8)	24 (77.4)	51 (79.6)
Number of sexual partners at the time of the study			
None	10 (30.3)	16 (51.6)	26 (40.6)
Only one	22 (66.6)	9 (29.0)	31 (48.4)
Two or more	1 (3.0)	6 (19.3)	7 (11.0)
Number of sexual partners in the last six months			
0	3 (9.0)	8 (25.8)	11 (17.2)
1	23 (69.7)	12 (38.7)	35 (54.7)
≥2	7 (21.3)	11 (35.4)	18 (28.1)

Continued

Average number of sexual encounters per month			
≤2	25 (75.7)	23 (74.1)	48 (75.0)
>2	8 (24.2)	8 (25.8)	16 (25.0)
Paid sex (money or service)	3 (9.0)	3 (9.6)	6 (9.3)
At least one pregnancy (girl)	9 (27.2)	NA	9 (27.2)

Regarding feelings of HIV-infected adolescents and sources of education about sexuality, more than 8 out of 10 HIA (84.8%) were afraid of infecting their partner, 133 (65.2%) of rejection and 116 (56.8%) of revealing their HIV status. Fear of vertical transmission of HIV was present in 141 (69.1%) of HIA. More than a third of the HIA (33.3%) felt anger upon learning of their HIV status, which persisted in 15.6% of them at the time of the study. Low self-esteem was present in 45 (22.0%), hopelessness (8.8%) and guilt (4.4%) of the cases. Sex education was provided by their teacher in 80 (39.2%) of cases and by friends (24.5%). Nearly 9 in 10 HIA (88.7%) reported using condoms to prevent HIV transmission and pregnancy during sexual intercourse. Nearly 7 out of 10 HIAs (67.1%) declared having already had at least one romantic relationship. The desire to procreate was present in 200 (98.0%) HIAs and 196 (96.0%) affirmed the right of PLHIV to sexual life.

3.3. Determinants of Sexual Activity among HIV-Infected Adolescents

Age between 18 and 19 years [OR = 11.1 (95% CI: 3.1 - 39.4), $p = 0.001$], lack of remuneration [OR = 9.8 (95% CI: 2.0 - 47.4), $p = 0.001$] and self-care were significantly associated with sexual activity in HIA, while school attendance was a protective factor. Self-funded HIAs were 21 times more likely to be sexually active [OR = 21.6 (95% CI: 2.3 - 179), $p = 0.004$] (Table 3). The absence of support from a psychologist in the six months preceding the survey and being one's guardian were significantly associated with sexual activity [OR = 2.0 (95% CI: (1.03 - 4.3), $p = 0.003$] (Table 3). HIAs who received sex education from their teacher were less likely to be sexually active [OR = 0.2 (95% CI: 0.1 - 0.6), $p = 0.002$] (Table 3).

Table 3. Socio-demographic factors, clinical and therapeutic characteristics and source of sex education and meaning of condom associated with sexual activity.

Socio-demographic factors	Sexually active		OR (95% CI)	P-value
	Yes n (%)	No n(%)		
Sex				
Male	31 (34.1)	60 (65.9)	0.8 (0.6 - 2.2)	0.4
Female	33 (29.2)	80 (70.8)	1	
Age				
[13 - 15]	3 (9.4)	29 (90.6)	1	
[15 - 17]	16 (18.2)	72 (81.8)	2.1 (0.6 - 7.9)	0.2
[18 - 19]	45 (53.5)	39 (46.5)	11.1 (3.1 - 39.4)	<0.001

Continued

Education					
Yes	53 (28.4)	134 (71.6)	1		0.002
No	11 (64.7)	6 (35.3)	0.21 (0.1 - 0.6)		
Level of education					
Primary	1 (9.1)	10 (90.9)	1		
Secondary	57 (32.2)	120 (67.8)	4.73 (0.6 - 37.8)		0.1
Superior	6 (37.5)	10 (62.5)	5.98 (0.6 - 59)		0.1
Profession					
With remuneration	2 (20.0)	8 (80.0)	1		
Without remuneration	138 (71.2)	56 (28.8)	9.8 (2.0 - 47.8)		0.001
Survival of parents					
Living parents	20 (25.9)	57 (74.1)	1		
Fatherless	17 (29.4)	41 (70.6)	1.2 (0.5 - 2.5)		0.6
Motherless	11 (36.6)	19 (63.4)	1.6 (0.6 - 4)		0.2
Double orphan	16 (41.1)	23 (58.9)	1.9 (0.8 - 4.5)		0.1
Person in charge of the teenager					
Parent(s)	33 (27.1)	89 (72.9)	1		
Own	8 (88.8)	1 (11.1)	21.6 (2.3 - 179)		0.004
Tutor	23 (31.5)	50 (68.4)	1.2 (0.6 - 2.3)		0.5
Psychologist consultations over the past six months					
Yes	18 (45.0)	22 (55.0)	1		
No	46 (28.05)	118 (71.9)	2 (1.03 - 4.3)		0.03
Source of sex education					
Friends	20 (40.0)	30 (60.0)	1		
Teacher	12 (15.0)	68 (85.0)	0.2 (0.1 - 0.6)		0.002
Parent(s)	12 (41.3)	17 (58.6)	1.06 (0.4 - 2.7)		0.9
Other family member(s)	5 (38.4)	8 (61.5)	0.9 (0.3 - 3.2)		0.9
Health care staff	10 (58.8)	7 (41.1)	2.1 (0.7 - 6.5)		0.1
Media	5 (33.3)	10 (66.6)	0.7 (0.2 - 2.5)		0.6

ART: Antiretroviral treatment.

3.4. Multivariate Analysis

Age 18 - 19 years (Adjusted OR = 4.6, $p = 0.001$) and condom use to prevent HIV transmission (Adjusted OR = 9.7, $p = 0.03$) were the independent factors associated with sexual activity among HIA. Those who received sex education from their teacher were less likely to be sexually active (Adjusted OR = 0.2, $p = 0.006$) than those who received education from their friends and those who feared HIV vertical transmission (Adjusted OR = 0.3, $p = 0.01$) (**Table 4**).

Table 4. Independent factors associated with sexual activity in HIV-infected adolescents.

<i>Factors associated with sexual activity</i>	Adjusted OR	Adjusted <i>P</i> value
Age (18 - 19) years	4.6	0.001
Education	0.2	0.07
Level of education (secondary)	3.8	0.3
Level of education (higher)	1.3	0.8
Motherless	1.1	0.8
Fatherless	0.5	0.4
Double orphans	1.4	0.6
Paid profession	7.3	0.2
Membership of an AYPLHIV	1.3	0.5
Person in charge (self)	4.4	0.2
Psychologist consultations over the past six months	1.5	0.3
Fear of being rejected by your partner	0.4	0.08
Fear of vertical transmission of HIV	0.3	0.01
Main source of education on sexuality (teacher)	0.2	0.006
Protective role of condoms in HIV transmission	9.7	0.03

4. Discussion

At the end of our study, more than a third of HIA were sexually active. Factors associated with sexual activity were age (18 - 19 years), school attendance, ART compliance, condom use, fear of HIV vertical transmission, sex education provided by teachers, despair and the feeling of anger. The sex ratio was in favor of girls. The same trend was noted by Ndongmo *et al.* in 2016 in a similar population [13], unlike Rwenge *et al.* in 2000, conducted in the general population [15]. Globally, in 2020, adolescent girls accounted for three-quarters of all new adolescent infections and this trend is most significant in sub-Saharan Africa in 2020, where adolescent girls are affected by HIV almost six times more unlike East Africa and Pacific Asia where male gender is most affected during adolescence.

Risky behaviors and vulnerability in this age group vary according to region, suggesting specific interventions that have been made to adapt to the dynamics of the epidemic [16].

Apprehension of HIV infection, characterized by fear (of rejection, contamination of the partner or future child) and secrecy, was omnipresent among HIA and had an undeniable impact on their sexual behavior, whether they are sexually active or not [17]. Our results were similar to previous studies on the desire to have children and to be involved in a romantic relationship [12] [13] hence the need to strengthen reproductive health education among HIA.

The mean age of the HIAs in the study was 16.8 years and 31.3% of them had ever had sexual intercourse. This rate of sexually active adolescents was significantly higher than the 21% reported by Mburu *et al.* in 2014 in Zambia in their study on HIV disclosure among adolescents [18], and at 15.1% by Ndongmo *et al.* in 2016 in their work on the sexual and reproductive health of HIA in Zambia [13]. It also far

exceeds the 11% found by Sandy *et al.* in 2019 in Zimbabwe in their study on the sexual behavior of HIA where the average age of the participants was 15 years [12]. However, these results seem lower than those of Kaushik *et al.* in 2016, which examined the relationship between age and sexual activity in a similar population in the United States and reported a 50% rate of sexual activity at an average age of 17 years [19]. Furthermore, the rate of sexual activity among HIA is close to that of 33.1% observed in the general population of adolescents aged 15 to 19 in 2011 in Cameroon during demographic and health surveys [20], and of the 36% reported by Rwenge in his study on the sexual behavior of adolescents in Bamenda [15]. This suggests that HIV infection does not constitute an obstacle to sexual activity among Cameroonian HIV-infected adolescents, confirming the hypothesis of no difference in sexual behavior between infected and uninfected adolescents [17] [21].

According to Sandy *et al.* in 2019, discussing sexuality with friends, guardians, or other family members outside of the adolescent's primary caregiver was a factor associated with sexual activity [12]. Nevertheless, we found that in our study more than half of sexually active adolescents found these people to be their main source of education, which could also explain the rate of sexual activity we obtained.

Among HIA who had ever had sexual intercourse, 27% lived with at least one parent, 31.5% with a guardian, and 88.8% lived alone. This supports Rwenge's findings that adolescents living alone or with a guardian were more likely to be sexually active than those living with their parents [15]. In addition, 29.2% were girls compared to 34.0% boys. These results are consistent with those of Rwenge, who found sexual activity rates of 29% and 40% respectively among girls and boys in his study on the sexual behavior of adolescents and young people in Bamenda [15]. Unlike those reported by Sandy *et al.* in 2019 in Zimbabwe, in a similar population where the rate of sexual activity was 13.8% and 7.8% among girls and boys respectively [12]; as well as those of the Cameroon 2011 EDS where the rate of sexual activity was 50.1% among girls compared to 38.8% among boys, all aged between 15 and 19 years [20], which would confirm a greater vulnerability in the female gender. In our study, the proportion of boys belonging to a support group or an AYPLHIV was slightly higher than that of girls, which could explain the higher rate of sexual activity among boys, given that the socialization of young people is correlated with sexual activity [22].

Among sexually active adolescents, several risky sexual behaviors were noted, including multiple partners, early and unprotected sex, and unplanned pregnancies. Birungi *et al.* in 2009 and Mhalu *et al.* in 2013 concur that having multiple partners and unprotected sex are prevalent among HIV-infected adolescents [23] [24], and it was noted that around 20% of sexually active adolescents in this study had not used a condom the last time they had sex. Admittedly previous studies have reported higher rates of unprotected sex among HIA, 60%, 62% and 65% respectively in the studies by Sandy *et al.* in 2019, Tassiopoulos *et al.* in 2013 and Mellins *et al.* in 2011 [12] [25] [26], but the fact remains that this 20% rate is not negligible if we bear in mind the problem of viral transmission. However, our results are similar to those of Ndongmo *et al.* in Zambia in 2016 and those of

Williams *et al.* in Uganda in 2013, who found a rate of unprotected sex of 38% and 26% respectively [13] [27]. These results on unprotected sex among HIA seem to confirm the theory of insufficient use of condoms despite being aware of the risks of unprotected sex, largely due to fear that the systematic use of condoms is an indication of their state of health and their partners discover their HIV status [28]. However, the condom use rate was slightly higher among girls than boys. This is consistent with the view of Krantz *et al.* that boys tend to take more risks and have more unprotected sex than girls [29]. Lack of condom use among adolescents, particularly those living with HIV, remains a public health problem because such behavior increases the risk of HIV transmission and reinfection [30]. Consecutive or simultaneous multiple partners was also a practice found among sexually active participants, with some going as far as 6 or even 7 sexual partners in the space of 6 months. Similar results were found in Zimbabwe by Sandy *et al.* and in the United States by Elkington *et al.* who found that 88.9% of sexually active HIA had a propensity to have multiple partners [12] [24]. This phenomenon is consistent with the view that these adolescents find it difficult to form and maintain relationships with others, as their lives have often been marked by bereavement and separation. This is confirmed in our study because only 1/3 of HIA still had both parents alive. These adolescents anticipate rejection by breaking up early, fearing that their partner will discover their HIV status [29]. This could also explain the practice of multiple partnerships in this population, especially since nearly 61% of sexually active adolescents in this study feared revealing their HIV status to their partners. In addition, 3% and 21.3% of girls had more than one sexual partner at the time of the study and during the six months preceding the study respectively, compared to 19.3% and 35.5% of boys. These results corroborate those of Rwenge who found that at all ages, the proportion of young men associated with multiple sexual partners was higher than that of young women, consistent with Krantz *et al.* [15] [30]. In addition to multiple sexual partners, there were other elements of risky sexuality, such as early sexual intercourse and unplanned pregnancies. On the other hand, multiparternishs and transactional sexual activity was not uncommon in our study. This monetization of sexual intercourse was done not only with older and richer partners but also with their young friends in exchange for sexual relations as described by Koblembi on a Central African Republic (CAR) [31]. The absence of a family support system due to frequent orphanage in our context and resulting precarity is often responsible for the low control over the negotiation of protected sex or contraception use in adolescent girls.

Nearly a quarter of sexually active adolescents had started their sex life before the age of 15, with boys starting earlier than girls. This result is similar to that found by Rwenge in the general population of Cameroonian adolescents [15], but higher than that of Ndongmo *et al.* in 2016 in Zambia, which found that only 14.3% of HIA had their first sexual experience before the age of 15 years [13]. According to Mwalabu *et al.* in their study, early sexual intercourse is due to the search for feelings of intimacy, love and acceptance that were lacking at home and/or peer pressure or linked to the satisfaction of survival needs [32]. However, some authors have claimed that

due to their status, HIAs especially those infected through vertical transmission tend to delay their first sexual intercourse [33]. This appears to be different currently due to better relative health status and reduced stigma among HIAs.

In HIA, pregnancy is an opportunity to prove to oneself that one is like others and especially to check one's bodily function [29]. In this study, the pregnancy rate among sexually active girls was lower than that found in the United States in a similar population [30]; but higher than the pregnancy rate of 5% while 24% have already started their reproductive life among girls aged 15 to 19 in Cameroon [34]. This result could explain the insufficient use of contraceptive measures among sexually active adolescents, particularly oral contraception. This situation is all the more worrying given the complication rate observed in this age group at the time of childbirth [33] and the vertical transmission.

After multivariate analysis, the independent factors significantly associated with sexual activity among HIA were the age group of 18 - 19 years, and the representation of the condom as an object of protection for oneself and others. The fear of transmitting the virus to one's future child and having one's teacher as the main source of education on sexuality were protective factors for sexual activity. Fear of being rejected by one's partner was a factor preventing sexual activity in HIA.

Age was a factor significantly associated with sexual activity in our study, similar to results found in Zimbabwe in 2019, where age doubled the risk of being sexually active in HIA [12]. For sexually active girls, the possibility of pregnancy and the desire to have a child can now be realized with less ambivalence. However, the results of the current study show that adolescents who feared vertical transmission and rejection from potential partners were less likely to be sexually active. This is consistent with negative representations of HIV, which lead to a climate of anxiety regarding the experience of sexuality and explain the delay in initiating sexuality [35]-[37]. HIAs who received sex education from their teachers were less likely to be sexually active than those who got this information from their friends. These results are similar to those found in Zimbabwe in 2019 where 10% of HIA became sexually active at the instigation of their friends and partners [12] [15].

Previous studies in Cameroon and Malawi have identified peer influence as one of the reasons for early sexual intercourse among HIA [15] [16]. Favored by the fact that in limited resources settings, sexuality remains a taboo subject and parents are hesitant to broach the subject with their children. Faced with peer pressure, girls sometimes do not have the strength to resist premarital sex, especially in urban areas, for fear of being marginalized by their peers [16] [17]. This situation would encourage risky sexual behavior probably due to difficulties in meeting SRH needs.

Only one sexually active HIA reported using birth control pills in addition to condoms as a way to prevent unwanted pregnancy. This result is consistent with those reported in Malawi where HIAs reported having little control over negotiating safe sex or contraception [16]. As well as the 2018 UNFPA report on

adolescents and youth in West Africa and the Center in 2015, which reported low use of contraception in Africa (33%), including the modern contraceptive prevalence rate of 19.45% in Cameroon [37].

HIAs with persistent feelings of anger after disclosure of their HIV status were more likely to be active than those who were not. Between anger and anxiety, the reproaches made to parents about vertical transmission and the parents' feelings of guilt would increase conflicts with their parents. This raises the need for follow-up and psychological support for HIA, who feel misunderstood, hence the need to involve psychologists in the management of HIA [38].

5. Conclusion

The sexual behavior of HIA was similar to that of adolescents in the general population. Factors influencing sexual activity were age, condom use, fear of vertical transmission of HIV, and education on sexuality provided by their teacher.

6. Limit of the Study

The results of this research should be interpreted with caution, however, as we had to include in the study participants who volunteered, so there could be a selection bias.

The COVID-19 pandemic that occurred during the recruitment period limited inclusions relative to the cohort, as few young adolescents visited the health facilities, although we were able to achieve the target sample size. Despite these limitations, the present study would be the very first to our knowledge on sexuality among HIV-infected adolescents in our country.

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Conflicts of Interest

The authors declare no conflict of interest and all authors have approved the latest version of this work.

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