

*Full Length Research Paper*

# **Knowledge, attitudes, perception and behaviours of HIV/AIDS among end-cycle students in Cote d'Ivoire: Cross-sectional survey**

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**In Cote d'Ivoire, the prevalence of HIV/AIDS has declined significantly in the last decade as a result of public health actions. An assessment of knowledge, attitudes, perception and behaviours was carried out to assess the outcome of the strategies for raising awareness and communicating with students about HIV/AIDS. A descriptive cross-sectional study was conducted in 2014 among students enrolled in third year at the university. An anonymous self-questionnaire including a consent form was provided. Mean scores were calculated from the items in the questionnaire to assess the level of knowledge, attitude, perception and behaviours of these students with regard to HIV/AIDS. The chi square test was used to compare the qualitative variables, and the quantitative variables were compared with the test of student. Among 561 students who participated in the study, 41.7, 26.7 and 31.6% were respectively registered in the sectors of human and social sciences (HSS), biosciences and health sciences. The mean age was  $25.9 \pm 3.4$  years with a sex ratio of 1.3. The mean knowledge score of certain modes of transmission was  $4.9 \pm 0.36$  out of 5 while that of condom positive perception was  $6.4 \pm 2.2$  out of 12. This perception score was significantly higher in women than in men ( $6.1$  vs.  $6.9$ ,  $p = 0.0001$ ). The mean acceptance score was  $7.3 \pm 2.2$  out of 10. The results of this work show good knowledge about HIV/AIDS among the students surveyed. However, the positive perception of the condom is far from being integrated in the student environment. This study also showed the persistence of HIV risk behaviour is out of sync with the level of knowledge. It would be important to review marketing and communication strategies about HIV.**

**Key words:** HIV/AIDS, students, knowledge, attitude, behaviours, Cote d'Ivoire.

## INTRODUCTION

Globally, during these last decades, a clear reduction in HIV/AIDS prevalence has been observed among young people (Hervish and Clifton, 2012). However, HIV/AIDS remains a public health concern, especially in developing countries. The will to fight against this disease is always affirmed but the challenges are still many (Unies, 2011). According to UNAIDS, 2.1 million people were newly infected with HIV in 2013 with 1.5 million deaths (Kapend et al., 2014).

In Cote d'Ivoire, public health actions in the fight against HIV/AIDS have led to a significant HIV prevalence reduction from 4.5% (in 2005) to 3.7% (in 2011), and now to 2.7% (in 2014) (InstitutNationalde laStatistique and ICFInternational, 2012). To help improve knowledge and reduce the burden of the disease, important efforts have been made through different prevention strategies, the cornerstone of the fight against the HIV epidemic (Sweat et al., 2012). However, strategies were sometimes poorly-adapted to the epidemiological situation in many of these developing countries. Indeed, interventions proposed in many settings were of poor quality and insufficiently focused on targets and vulnerable populations (Somé et al., 2014; Unies, 2011). Youth, which comprises of school aged children and students are the most at risk for this disease in developing countries. Many factors have been associated with risk factors related to youth. It is therefore necessary to explore some of these factors to best address their needs.

After several decades of struggle against the disease, public health actions have helped strengthen knowledge, attitudes, perceptions and behaviours of students regarding HIV/AIDS. The objective of this work was to assess the knowledge, attitudes, perception and behaviours of students enrolled at the end of the first cycle of university in Cote d'Ivoire.

## MATERIALS AND METHODS

### Study design and population

This was a descriptive cross-sectional study that took place from January to September 2014 among students enrolled in a bachelor's degree program in Universities in Cote d'Ivoire. This study was inspired by the study knowledge, attitude, beliefs and practice against HIV/AIDS conducted periodically by the Regional Health Observatory of Ile de France (Beltzer et al., 2011).

### Inclusion and exclusion criteria

The students included in this study had to give their informed

consent and be registered in the third year at an Ivorian university in the two major cities of the country (Abidjan and Bouaké). Those who did not give their consent were excluded.

### Data collection

The students were selected by reasoned choice, in universities and colleges in Abidjan and Bouake. The data was collected from a strictly anonymous self-questionnaire explaining the purpose of the study and including a consent form. The questionnaire derived from that of the study of Beltzer et al. (2011) study. This questionnaire was related to socio-demographic characteristics (age, sex, studied option, city of residence, acquaintance with a person living with HIV, knowledge about HIV/AIDS and its ways of prevention, the perception of the disease and personal risk of being contaminated and to sexual activity and preventive behaviour).

According to the disciplines studied, students were grouped into three broad categories. The first category called human and social sciences (HSS) grouped students who studied literature, history, anthropology, economics and law, together. The second, biosciences, included those studying biochemistry, basic and applied sciences, food technology sciences and geology. And, the third category, health, included students who were taking courses in medicine, dental surgery, medical biology and laboratory technician.

### Scoring

In order to assess the level of knowledge, attitudes, perception and behaviours of these students with regards to HIV scores were calculated from the questionnaire using the method described in the study of Beltzer et al. (2011).

To assess the knowledge of modes of HIV transmission, we computed two scores of which, one of certain modes of transmission and the other of uncertain modes of transmission. These scores were computed from the provided responses, and made up of the addition of the good responses to each of the items relating to the certain or uncertain modes of HIV transmission. For the knowledge score of certain modes of transmission, people should answer yes to the propositions related to possible circumstances of HIV transmission such as *unprotected sexual relations and injection with contaminated needle*; and *no to mosquito bite, in public toilets and drink in the glass of a contaminated person*. Each fair item was rated 1 and the score ranged from 0- 5. A high score close to 5 conferred a better understanding of certain HIV transmission modes. Regarding the knowledge score of uncertain HIV transmission modes, people should answer yes to the proposals to HIV transmission possibilities such as *tattoo or piercing, use of the mechanical razor of a contaminated person, during dental care and kissing a contaminated person*. Each fair item was rated 1 and the score ranged from 0 to 4. The higher the score, the more uncertain circumstances of transmission are considered possible.

A score for acceptance of people living with HIV (PLHIV) was calculated to assess attitudes of respondents towards HIV-positive people. Several questions were asked to student related to their attitudes towards PLHIV: *work with him?*, *go to eat at his place?*, *go on holiday with him?*, *continue to see each other or entrust your children to him?*, *having sex with him using a condom?* Thus, for each item, a rate was assigned to each answer: 0 for *no*, 1 for *do not know* and 2 for *yes*.

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**Table 1.** Socio-demographic characteristics of respondents.

	Variable	Frequency	Percentage
Gender	Male	314	57.4
	Female	233	42.6
Age class	< 25 years	247	49.1
	25 to 29 years	227	45.1
	≥ 30 years	29	5.8
Discipline studied	Human and Social Sciences	234	41.7
	Biosciences	150	26.7
	Health	177	31.6
Residence	Abidjan	312	55.6
	Bouake	249	44.4
Living in a couple	No	474	89.6
	Yes	55	10.4
Knowing someone living with HIV/AIDS	No	346	65.0
	Yes	186	35.0

The sum of these rates constituted the score which ranged from 0-10. The higher the value of the score, the more favourable was the attitude towards PLHIV.

For the calculation of the positive perception score of the condom, the rate 0 was assigned to the answer yes, 1 to *do not know* and 2 to *no* for the items: *The condom, it decreases the sexual pleasure; the condom, it encourages to have several partners; the condom, it creates doubts about the partner; when we love each other we do not need a condom* and; *the condom is complicated to use*; except for the item *the condom is something banal* where the rate of 0 was assigned to *no*, 1 to *do not know* and 2 to *yes*. The score was the sum of these rates and could range from 0-12. The higher the average value of the score was, the higher the perceived image of the condom was.

### Statistical analysis

Qualitative variables were described by numbers and percentages and compared using the chi square test or the exact file test where appropriate. Quantitative variables were described by their means with their standard deviations and their mode. The Student or Wilcoxon test was used to compare these variables. These tests were carried out in a bilateral formulation at the 5% threshold.

The data was entered using the Epidata software and analyzed using the Stata 11 software.

## RESULTS

Among the 561 students who participated in the study, 41.7, 26.7 and 31.6% were respectively enrolled in the fields of HSS, biosciences and health sciences. The average age of these students was 25.9, ranging from 18-48 years. Nearly half were under 26 years old and

57.4% were male. Among them, 55.6% live in Abidjan, 10.4% reported living in a couple and 35% reported knowing someone living with HIV/AIDS as shown in Table 1.

The three most effective HIV protective measures most frequently mentioned by the students surveyed were: 1) Ask a partner for a test (91.8%), 2) Regularly test for the AIDS virus (91.4%) and 3) Use a male condom (88.6%). However, most of them consider that asking a partner about his past sex life is an effective protective measure against HIV. Washing after the sexual act (16.3%) and the coitus interrupted (8.9%) were considered as an effective protective method by some students as described in Table 2.

Regarding the knowledge of the existence of a treatment, although the majority of respondents (82.9%) heard of multi-therapies, only 29% said they knew about the existence of post-exposure prophylaxis.

The average knowledge score of certain transmission modes was  $4.9 \pm 0.4$ , ranging from 3- 5 with a mode at 5, while the score for the uncertain modes of transmission was  $2.8 \pm 0.8$ , ranging from 0-4 with a mode at 3. These two scores were independent of gender, age, education, the notion of living as a couple and independent of knowing someone who is living with HIV or sick of AIDS as presented in Table 3. Among these students, respectively, 99.6 and 98.4% think that HIV is transmitted when having unprotected sexual relation and using contaminated needle for injection. For these students, the HIV transmission is possible when doing tattoo or piercing (95.9%), using mechanical razor of a

**Table 2.** Protective measures deemed effective against the AIDS virus by students in some university of Côte d'Ivoire.

Proposition	No [N (%)]	Yes [N (%)]
Request a screening test from its partners (N = 534)	44 (8.2)	490 (91.8)
Regularly test for the AIDS virus (N = 526)	45 (8.6)	481 (91.4)
Use a male condom (N = 527)	60 (11.4)	467 (88.6)
Ask her partner questions about her past sex life (N = 512)	163 (31.8)	349 (68.2)
Choose your partners correctly (N = 509)	199 (39.1)	310 (60.9)
Having sex with few different partners (N = 509)	351 (69.0)	158 (31.0)
Wash after the sexual act (N = 509)	427 (83.9)	82 (16.1)
Coitus interrupted (N = 493)	449 (91.1)	44 (8.9)

contaminated person (98.2%), during dental care (63%), kissing a contaminated person (28.1%). Very few still think that HIV can be transmitted when using public toilet (5.4%) or drinking in the glass of a contaminated person (2.29%).

The average positive condom perception score was  $6.4 \pm 2.2$ . Among the students surveyed, this score ranged from 0-12 with a mode of 6. Most of them thought that condom encourages having several partners while only 3.82, 5.1 and 8.6% of them respectively considered the condom as something banal, the condom is complicated to use and when we love each other we do not need a condom. Compared to men, the women interviewed had a better score ( $6.9 \pm 2.2$  vs.  $6.1 \pm 2.2$ ,  $p = 0.0001$ ). Students enrolled in the health sector had a higher score than the others ( $p = 0.001$ ). However, this score was not influenced by age ( $p = 0.25$ ), the notion of living in a couple ( $p = 0.2$ ) or the knowledge of a person with HIV or AIDS ( $p = 0.4$ ) as shown in Table 3.

The mean acceptance score for HIV-positive persons was  $7.3 \pm 2.2$ . If they knew that a person has HIV, 89.9% declared that they would accept to work with him, 85.1% declared they would go on holiday with him, 77.7% declared they would go eat at his place and 62.5% declared they would continue to see each other or entrust their children. But only, 18.7% of them would accept having sex with a PLHIV using a protective measures like condom. Compared with students in other sectors, those in the HSS reported more often to agree to have sex with an HIV-positive person ( $p = 0.004$ ); screen regularly ( $p = 0.0001$ ) and request a screening test from his partners ( $p = 0.003$ ).

Of 535 respondents, 85.8% reported having had sex during the last 12 months. The median age at first sexual relation was 18 years (interquartile range: 17-20 years). The average number of partners among sexually active students was 2.4. In the last 12 months, 39.71% of participants reported having sex with at least two partners. About two-thirds (63.4%) of students have reported feared of having been infected with HIV at least once in their lifetime. Regarding the risk of contamination, 48.5% reported a risk of contamination greater than or

equal to the average. Only 44% of students surveyed said they had taken the HIV test once in the 12 months preceding the study when only 69.8% said they tested for HIV at least once in their lifetime. Some 74.1% of respondents said that they would be more likely to self-test if there was a self-screening HIV test.

## DISCUSSION

This study showed a good level of knowledge of the certain HIV transmission modes by the students surveyed. However, their level of knowledge of the uncertain HIV transmission modes was average. Some authors have shown good knowledge of HIV/AIDS among students with a proportion of correct answers ranging from 70 to 92% (Alerte, 2016; Fotedar et al., 2013). This study also showed that these students had an average level of knowledge of uncertain modes of transmission of HIV. This would be justified by the lack of consideration for this type of information in the various awareness campaigns. Indeed, most of the messages disseminated during awareness campaigns focus on the certain modes of transmission, given their importance in the transmission of HIV/AIDS. The study reveals some very important aspects of HIV/AIDS that remain unappreciated. Indeed, more than two-thirds of students were unaware of the existence of post-exposure prophylaxis in the event of accidental exposure, while this therapeutic strategy significantly reduces the risk of contamination by the virus and needs to be achieved within the first 4 h after exposure, and at the latest, up to 48 h. A study conducted in the Ile de France showed that more than 70% of 18-30 years olds were unaware that there was an emergency treatment that could stop HIV infection after taking a risk (Beltzer et al., 2011). Regarding effective ways of fighting HIV, more than 90% of them feel that regularly testing for HIV is an effective way to avoid being infected with HIV. Only in third place do they judge condom use as an effective way to protect themselves against HIV infection. Authors have also shown that the effectiveness of condoms is less and less recognized

**Table 3:** Factors influencing the scores of knowledge of transmission modes of HIV transmission, positive condom perception and acceptance of HIV-positive people scores among students in some university of Côte d'Ivoire.

Parameter		Certain transmission		Incertain transmission		Positive perception of the condom		Acceptance of HIV-positive people	
		Mean score $\pm$ SD	p	Mean score $\pm$ SD	p	Mean score $\pm$ SD	p	Mean score $\pm$ SD	p
Gender	Male	4.9 $\pm$ 0.36	0.88	2.80 $\pm$ 0.78	0.28	6.1 $\pm$ 2.2	0.0001	7.1 $\pm$ 2.4	0.31
	Female	4.9 $\pm$ 0.36		2.89 $\pm$ 0.79		6.9 $\pm$ 2.2		7.4 $\pm$ 2	
Age class	< 25 years	4.88 $\pm$ 0.37	0.88	2.77 $\pm$ 0.81	0.17	6.4 $\pm$ 2.1	0.25	7.3 $\pm$ 2.1	0.94
	25 – 29 years	4.89 $\pm$ 0.38		2.92 $\pm$ 0.76		6.2 $\pm$ 2.4		7.2 $\pm$ 2.4	
	$\geq$ 30 years	4.96 $\pm$ 0.20		2.96 $\pm$ 0.76		6.9 $\pm$ 1.9		7.1 $\pm$ 2.5	
Disciplines	Human and social sciences	4.87 $\pm$ 0.38	0.53	2.88 $\pm$ 0.74	0.31	6.3 $\pm$ 2.4	0.001	7.4 $\pm$ 2.2	0.02
	Biosciences	4.86 $\pm$ 0.41		2.88 $\pm$ 0.84		6.0 $\pm$ 2.0		6.7 $\pm$ 2.5	
	Health	4.94 $\pm$ 0.29		2.75 $\pm$ 0.77		6.8 $\pm$ 2.0		7.5 $\pm$ 2	
Notion of living in a couple	No	4.89 $\pm$ 0.37	0.56	2.82 $\pm$ 0.80	0.39	6.3 $\pm$ 2.2	0.2	7.2 $\pm$ 2.3	0.05
	Yes	4.93 $\pm$ 0.25		2.93 $\pm$ 0.71		6.9 $\pm$ 2.5		7.7 $\pm$ 2.2	
Knowing someone living with HIV/AIDS	No	4.88 $\pm$ 0.38	0.18	2.83 $\pm$ 0.79	0.83	6.3 $\pm$ 2.2	0.4	7.1 $\pm$ 2.3	1.13
	Yes	4.92 $\pm$ 0.32		2.83 $\pm$ 0.75		6.4 $\pm$ 2.3		7.5 $\pm$ 2.1	

(Saboni and Bektzer, 2012).

This study also reveals that girls have a better perception of condoms than boys. This could be explained by all the awareness campaigns made in the context of reducing mother-to-child transmission of HIV. The average value of the acceptance score of these students reflects the persistence of prejudice and stigma. Bahi et al. (2008) also showed the existence of multiple prejudices among Abidjan students.

There is still a necessity to inform about the need to get tested. Despite the many awareness campaigns and screening points, few students reported being screened in the last 12 months. This suggests strengthening awareness campaigns

on the importance of HIV testing.

The mean age of first sexual relation was 18 years, while that reported by Haddison et al. (2013) in a study in Cameroon among students was 17 years old. Like this work, the study by Haddison et al. (2013) also found that the average number of partners among sexually active students was greater than 2. Other authors have also highlighted risky behaviours of students in Cote d'Ivoire. They reported that only 14.5% of students regularly used a condom, 57% used casual partners and 32.4% had more than one sexual partner (Tiembré et al., 2007). Condom use among young people remains low in many developing countries (Rwenge, 2013); in addition,

they receive very little voluntary counselling and testing services (UNICEF, 2011).

The results of this work highlight the gap between knowledge and behaviours toward HIV. Indeed, people can have very good knowledge of HIV prevention, transmission, clinical manifestations and risk behaviours, without using the recommendations to protect themselves (Zerbo, 2014). Other authors have also reported the discrepancy between the level of knowledge of HIV risk by people and their behaviour (Alerte, 2016; Epelboin, 1992; Toudeft, 2010).

In overall results, the challenge of raising HIV/AIDS awareness among students is far from being met. Persistent prejudices a social and

representations favour stigmatization. Ignorance of HIV post-exposure prophylaxis measures and risky behaviours are still high in the student environment.

## LIMITATIONS OF THIS STUDY

Limitation of this study was the sampling method which was empirical; the type of sampling method that makes any generalisation difficult.

Although the results of this study are not generalizable to the entire youth in Cote d'Ivoire, they provide guidance on HIV prevention strategies in terms of youth awareness. It would then be important to review the marketing and communication strategies for HIV prevention for the young people.

## ETHICAL CONSIDERATIONS

Ethical approval was not required for this study because it was strictly anonymous and no intervention was applied. Indeed, no nominative or indirectly nominative data has been collected. There was therefore no way to identify the respondents. However, before distributing questionnaires to students, the objectives of the study were explained to them. Only students who had given their informed consent through the form contained in the questionnaire were included in the study. This study falls in Non-Research Determination.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests

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