

Knowledge on HIV/AIDS among Students of the Faculty of Health Sciences, Brazzaville, Republic of Congo

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Abstract Background: The rate of HIV infection in the Republic of Congo is 5%. Training on HIV/AIDS is not formally included in the university curriculum. We evaluated students' knowledge and attitudes about HIV/AIDS in the Faculty of Health Sciences of Brazzaville. **Methods:** All 3rd year students in medicine, public health and biomedical sciences, plus the 4th, 5th and 6th years of medicine completed the survey through a questionnaire developed by the research unit. **Results:** A total of 159 students participated in the survey. The willingness to work with people living with HIV and the willingness to take care of them were respectively 88.05% and 91.19%. More than 92% of the students had a positive attitude toward people living with HIV/AIDS. It is therefore essential that caregivers be properly informed to improve their attitude and thus the quality of care for people living with HIV/AIDS. With regard to clinical questions on HIV/AIDS, knowledge about virology was insufficient. Students in clinical and especially preclinical years need to broaden their knowledge about clinical symptoms strongly associated with HIV/AIDS. **Discussion:** The majority of health science students had a good knowledge of HIV. Nearly half of them did not have a good attitude towards people living with HIV/AIDS. However, for the low proportion (<17%) of students with negative attitudes, a review of the current educational components on HIV/AIDS is required. Knowledge of clinical signs and treatment of HIV/AIDS were moderate: at most 71% of students knew the correct answers. **Conclusion:** It is necessary to strengthen the basic knowledge of medical students on HIV/AIDS, but also to fight against misconceptions about this disease. This study showed that students need to learn more about HIV / AIDS. And the negative perception of PLWH by medical students should be addressed to improve the quality of care.

Keywords: HIV/AIDS, Knowledge, Attitude, Students, Faculty of Health Sciences, Republic of Congo

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1. Background

HIV infection remains a public health problem. WHO estimates that 1.8 million people are newly infected with HIV worldwide, about 36.7 people living with HIV, and nearly 1.6 million people die each year [1]. The vast majority of people infected with HIV are living in low- and middle- income countries, with an estimated 25.5 million living in sub-Saharan Africa [2].

In the Republic of Congo, according to studies conducted by the National Council against HIV/AIDS (CNLS), HIV infection is currently in a phase of implosion. The national prevalence is estimated at 5% in 2016, with disparities from one city to another: Brazzaville (3.3%), Pointe-Noire (9.9%), Ouesso (5%) and Dolisie (11.3%). In 2016, Pointe-Noire counted a large number of people affected by the infection between 90 000 and 150 000, with a tendency to feminization [3].

Knowledge, attitudes and practices about HIV/AIDS are some of the key points in the fight against HIV/AIDS [4,5]. Training on HIV optimizes the knowledge of prospective doctors and enables them to develop a positive attitude towards people living with HIV [6]. Many prevention programs often focus on increasing knowledge about HIV transmission, neglecting other educational aspects [7,8,9,10]. This ultimately increases stigmatization of people living with HIV/AIDS [11,12]. Stigma is a negative attitude towards people living with HIV; stigmatizing attitudes are also associated with misconception about HIV transmission [9,10,11]. It is still necessary to evaluate the knowledge, attitudes and practices of medical or public health students related to HIV/AIDS. This evaluation will allow the establishment of adequate training related to HIV. These specific trainings will improve the performance of medical students to better care for people living with HIV. Several studies have assessed students' knowledge of HIV/AIDS and their attitudes toward people living with HIV

[13,14,15]. To date, few studies have been conducted with undergraduate medical students in African countries: South Africa [16], Botswana [17] and Uganda [18].

A study by Whalen et al. found that medical students refused to care for HIV/AIDS patients [19]. This refusal is an unacceptable behavior for future medical doctors, which illustrates the extreme discomfort that HIV/AIDS raises. Recent studies have investigated doctors' knowledge, beliefs, fears and attitudes towards HIV/AIDS. Other studies have focused on the willingness of medical students to care for people living with HIV/AIDS [20,21]. These studies amply demonstrate the importance of setting up courses on HIV/AIDS and the need to train medical students in the care of people living with HIV/AIDS [15]. If the HIV/AIDS related knowledge level of medical students, future doctors is inadequate, integrating this training into the curriculum in the faculty of medicine is a must. Improving knowledge of physicians will lead to more positive attitudes and reduce stigma associated with HIV/AIDS [22].

In the literature, knowledge of HIV/AIDS among medical students has been described as good or high [15,22,23], and appropriate attitude toward people living with HIV [15,22,24,25]. Other studies on the contrary have reported a lack of knowledge of HIV/AIDS among medical students [15,26,27,28,29,30,31]. Previous studies have shown that medical students have a good knowledge of HIV/AIDS.

In 2015, 75,000 people were living with HIV/AIDS, in the Republic of Congo, with approximately 13,000 infants from vertical transmission [32]. In the Republic of Congo, there is only one Faculty of Health Sciences (FSSA), which comprises four departments: general medicine, biomedical sciences, nursing and public health.

Previously, a report on HIV/AIDS identified stigma and discrimination as an obstacle to the prevention, treatment and care of people living with HIV/AIDS (PLWA) [33]. No studies addressing the issue of knowledge about HIV/AIDS and attitudes towards people living with HIV/AIDS among students in the Faculty of Health Sciences have yet been conducted. In this study, we aimed at evaluating the HIV/AIDS knowledge level and attitudes towards PLWA among FSSA students in Brazzaville, Republic of Congo.

2. Methods

2.1. Study Design

We conducted a one-day cross-sectional study in March 2013 to assess knowledge and attitudes about HIV/AIDS in the Republic of Congo. A questionnaire was given to the students. The responses of the preclinical year students were compared to those of the clinical year students.

2.2. Scenario and Participants

The study population was made up of FSSA students from the Marien Ngouabi University of Brazzaville from the medical, biomedical and public health curricula. Included in the study were all students in the classrooms on the day of the survey and consenting to participate. The

7th grade students did not participate in this study; they were on leave on the day of the assessment. The data were collected by investigators trained on this occasion, using a structured self-administered questionnaire.

All included students were informed of the study and the participation was anonymous and voluntary. Students were asked to take 30 minutes to complete the questionnaire. Prior to the start of the assessment, students were informed of the technical terminology used in the questionnaire and received guidance on how to complete the form. The questionnaire used for this study was based on available literature [14,34,35,36,37,38]. Students were asked not to discuss issues with their classmates. If they had questions, students were encouraged to ask a member of the research team. Data entry and analysis were done with Epi Info version 7.1. The chi-square test was used to calculate the significant association between categorical variables. When P-value was <0.05 the statistical results were significant.

2.3. Ethical Statement

The administration of the University Marien Ngouabi wanted through this survey to evaluate the students of the Faculty of Sciences of the Health, to see how to improve the quality of their training and their medical course. The Dean of the Faculty of Health Sciences validated the questionnaire. Permission to carry out the research and formal approval of the study was obtained from the Dean of the FSSA.

Participation in the study was on a voluntary and anonymous basis, participants were informed of the objectives of the survey.

3. Results

3.1. Characteristics of the Participants

The investigation data retrieval identified 159 students as follows: 137 (86%) of the respondents were medical students, 12 (16%) were public health students and 10 (13%) were biomedical sciences' students. The average age of participants was 22.8 years \pm 2.5 (range 19-36), 52.20% of participants were women. Table 1 summarizes the demographic characteristics of the respondents.

Table 1. Socio-demographic Characteristics of participants

| SOCIO-DEMOGRAPHIC CHARACTERISTICS | | N (%) |
|-----------------------------------|------------------------------------|--------------|
| Age range | <20 | 6 (3.77%) |
| | 20-25 | 121 (76.1%) |
| | >25 | 32 (20.13%) |
| Gender | Male | 76 (47.8%) |
| | Female | 83 (52.2%) |
| Educational field | Biology | 10 (6.29%) |
| | Public health | 12 (7.55%) |
| | Medicine | 137 (86.16%) |
| year of study | 3 rd year Public health | 12 (16%) |
| | 3 rd year Biology | 10 (13.33%) |
| | 3 rd year Medecine | 53 (70.67%) |
| | 4 th year Medecine | 24 (15.09%) |
| | 5 th year Medecine | 29 (18.24%) |
| Level of clinical | 6 th year Medecine | 31 (19.5%) |
| | Preclinical | 73 (45.91%) |
| | Clinical | 86 (54.09%) |

3.2. Acceptability of People Living with HIV/AIDS

Most students in the Faculty of Health Sciences agreed to live in the same community as people living with HIV/AIDS (83.02%). The majority was willing to work with people living with HIV/AIDS (88.05%); care for people living with HIV/AIDS (91.19%). These data are presented in [Table 2](#).

3.3. Clinical Knowledge of HIV/AIDS among Medical Students

Comparing the clinical knowledge of HIV/AIDS between students in the clinical year and those in the preclinical year, continuous fatigue was chosen as the sign and symptom of HIV/AIDS by 50% vs 66.28% ($p < 0.04$). The host defense cells mainly affected by AIDS were T cells at 93.02% vs 75% ($P = 0.09$). An individual carrying anti-HIV antibody is an HIV carrier for 70.93% vs 46.15% ($P < 0.003$). Only 37.21% of students in clinical years versus 23.08% of students in preclinical years knew the time between the first contact of a person with the virus (infection) and the detection of antibodies against HIV in the blood or other fluids. Some students 17.31% thought that it could take up to 5 years for these antibodies to be detectable. Only 8 students of preclinical years (15.38%) versus 29 of clinical years (33.72%) students gave a correct answer regarding the time elapsed between seroconversion and HIV antibody production which is 6 to 12 weeks ($p < 0.05$). There were 19 (36.54%) preclinical students Vs 16 (18.6%) clinical students ($p < 0.01$) declaring

they do not know the time between seroconversion and the production of anti-HIV antibodies (see [Table 3](#)).

The association of Kaposi's sarcoma, oral candidiasis, and oral hairy leukoplakia as HIV-associated lesions was known by a higher proportion of students in clinical years compared to students in preclinical years ($p < 0.05$).

A considerable number (19.5% of respondents) of students said there was no cure for HIV/AIDS. Unfortunately a small proportion considers that there is a cure for HIV/AIDS (19.5%). There were 90.57% of students who reported that people living with HIV should be isolated, and 69.18% thought that people living with HIV should be treated in a separate ward. A percentage of 72.6% of students knew they could not identify someone with HIV/AIDS by looking at them.

Some students felt that people living with HIV should not be fired from their work place (93.71%) and that people living with HIV/AIDS should not be quarantined (94.97%). Several students (82.3%) agreed that "it would be shameful if someone in their family had HIV", while 73.58% said it does not bother them if their classmate has AIDS. Similarly, 83.02% of students believed they had the right to refuse to treat a patient with AIDS. The majority (94.34%) of students agreed that "if one of their friends has HIV, he will continue to be friend with him" (94.34%). Students (74.21%) reported being competent enough to provide treatment, care and counseling to HIV / AIDS patients, and 84.91% of students felt that a professional training was needed to care for people living with HIV/AIDS. However, 35.85% of students thought it was difficult to sympathize with people living with HIV/AIDS (see [Table 4](#)).

Table 2. Participants' behaviors towards PLWA

| Behaviors | Yes | No |
|--|--------------|-------------|
| To live in the same community with people living with HIV/AIDS | 132 (83.02%) | 27 (16.98%) |
| To work with people living with HIV/AIDS | 140 (88.05%) | 19 (11.95%) |
| To take care of people living with HIV/AIDS | 145 (91.19%) | 14 (8.81%) |

Table 3. HIV/AIDS related clinical knowledge of participants

| KNOWLEDGE ON HIV/AIDS | | PRE-CLINICAL N= 73 (%) | CLINICAL N= 86 (%) | P-value |
|--|--------------------------------|------------------------|--------------------|---------|
| Signs and symptoms of AIDS | Persistent Fatigue | 26 (50) | 57 (66.28) | 0.04 |
| | Chronic diarrhea | 44 (84.62) | 85 (98.84) | 0.001 |
| | Weight loss | 46 (88.46) | 78 (90.7) | 0.4 |
| | I don't know | 0 (0%) | 0 (0%) | - |
| Defenses of cells affected with HIV / AIDS | Macrophages | 8 (15.38) | 28 (32.56) | 0.01 |
| | Phagocytes | 8 (15.38) | 16 (18.6) | 0.4 |
| | T-lymphocytes | 39 (75) | 80 (93.02) | 0.003 |
| | B-lymphocyte | 20 (38.46) | 31 (26.05) | 0.4 |
| | I do not know | 11 (21.15) | 3 (3.49) | 0.001 |
| A person carrying the HIV antibody is | Less than 6 weeks | 11 (21.15) | 24 (27.91) | 0.2 |
| | In immunity to HIV infection | 14 (26.92) | 18 (20.93) | 0.2 |
| | An HIV carrier | 24 (46.15) | 61 (70.93) | 0.003 |
| | I do not know | 17 (32.69) | 9 (10.47) | 0.001 |
| Seroconversion time | Less than six weeks | 5 (9.62) | 10 (11.63) | 0.4 |
| | 6-12 weeks | 8 (15.38) | 29 (33.72) | 0.01 |
| | 13-24 weeks | 12 (23.08) | 32 (37.21) | 0.06 |
| | 24 weeks - 5 years | 9 (17.31) | 9 (10.47) | 0.1 |
| | I do not know | 19 (36.54) | 16 (18.6) | 0.01 |
| Lesions associated with HIV | Kaposi Sarcoma of oral | 12 (23.08) | 75 (87.21) | 0.0000 |
| | Oral candidiasis | 24 (46.15) | 75 (87.21) | 0.000 |
| | Oral hairy leukoplakia | 4 (7.69) | 28 (32.56) | 0.0004 |
| | ITP | 3 (5.77) | 9 (10.47) | 0.2 |
| | Xerostomia | 2 (3.85) | 8 (9.30) | 0.1 |
| | Salivary gland enlargement | 2 (3.85) | 2 (2.33) | 0.4 |
| | Melanic oral hyperpigmentation | 10 (19.32) | 17 (19.77) | 0.5 |
| | Crohn's disease | 13 (25) | 13 (15.12) | 0.1 |
| | I don't know | 0 (0%) | 0 (0%) | - |

Table 4. Perception and believe among student regarding HIV/AIDS

| Statement about AIDS | Yes (%) | No(%) | I don't know(%) |
|---|-------------|-------------|-----------------|
| Competent enough to provide treatment, care and counseling to HIV / AIDS patients | 118 (74.21) | 36 (22.64) | 5 (3.14) |
| People living with HIV should be isolated | 5 (3.14) | 144 (90.57) | 10(6.29) |
| Children living with HIV should go to school | 153 (96.23) | 4 (2.52) | 2 (1.26) |
| People living with HIV should be treated separately | 39 (24.53) | 110 (69.18) | 10 (6.29) |
| People living with HIV should be dismissed from work | 7 (4.4) | 149 (93.71) | 3 (1.89) |
| People living with HIV must be quarantined | 4 (2.52) | 151 (94.97) | 4 (2.52) |
| My professional education has provided me with enough information to work safely with AIDS patients | 135 (84.91) | 19 (11.95) | 5 (3.14) |
| Can we say if a person has AIDS by looking at him | 36 (22.64) | 116 (72.6) | 7 (4.4) |
| I believe I have the right to refuse to treat an AIDS patient | 132 (83.02) | 23 (14.47) | 4 (2.52) |
| There is a cure against HIV/AIDS | 31(19.5) | 118 (74.21) | 10 (6.29) |
| I will be ashamed if a family member has AIDS | 24 (15.09) | 131 (82.39) | 4 (2.52) |
| It is difficult to empathize with people with AIDS | 57 (35.85) | 95 (59.75) | 7 (4.4) |
| If one of my friend (s) have HIV, i will continue to be friend (s) with him /her | 150 (94.34) | 4 (2.52) | 5 (3.14) |
| That does not bother me if my classmate has AIDS | 117 (73.58) | 39 (24.53) | 3 (1.98) |

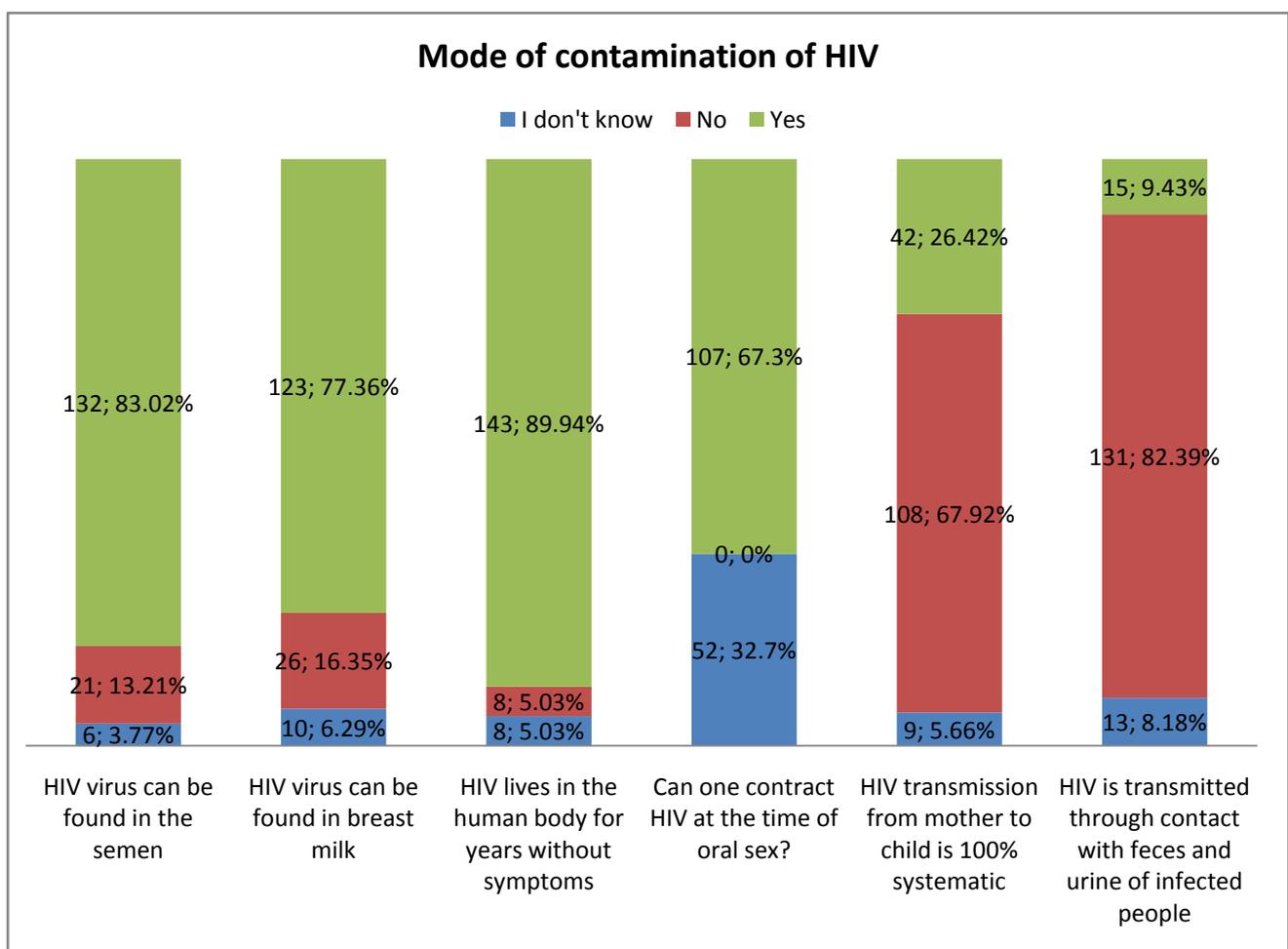
**Figure 1.** Proportion of student responses on the mode of contamination concerning HIV

Figure 1 shows the percentage of students who correctly answered questions about HIV transmission routes. Students' level of knowledge was highest with regard to HIV/AIDS contamination: 83.02% of students knew that the HIV virus is found in breast milk, while 89.4% of students thought that HIV stays in the human body for years without symptoms. Only 13.21% of students reported that the HIV virus is not in sperm, 26.42% of students thought that HIV transmission from mother to child were 100% systematic, 16.35% did not know that HIV is in breast milk and 32.7% knew that HIV can be contracted during oral sex.

3.4. Clinical Signs and Treatments of HIV/AIDS

The responses of students following the medical curriculum regarding treatment and clinical questions about HIV/AIDS are summarized in Figure 1. Sixty-one (70.93%) students in clinical year vs 14 (26.42%) students in the pre-clinical year considered that post-exposure ARV prophylaxis is recommended. Only 35.71% of students in clinical year vs 64.29% of students in pre-clinical year responded that osteomyelitis, endocarditis and typhoid are the main infections causing

death. Finally, 44 (51.16%) of students in clinical year vs 16 (30.19%) of pre-clinical year students knew that acyclovir/ribavirin and amantadine were antiretrovirals (Figure 2).

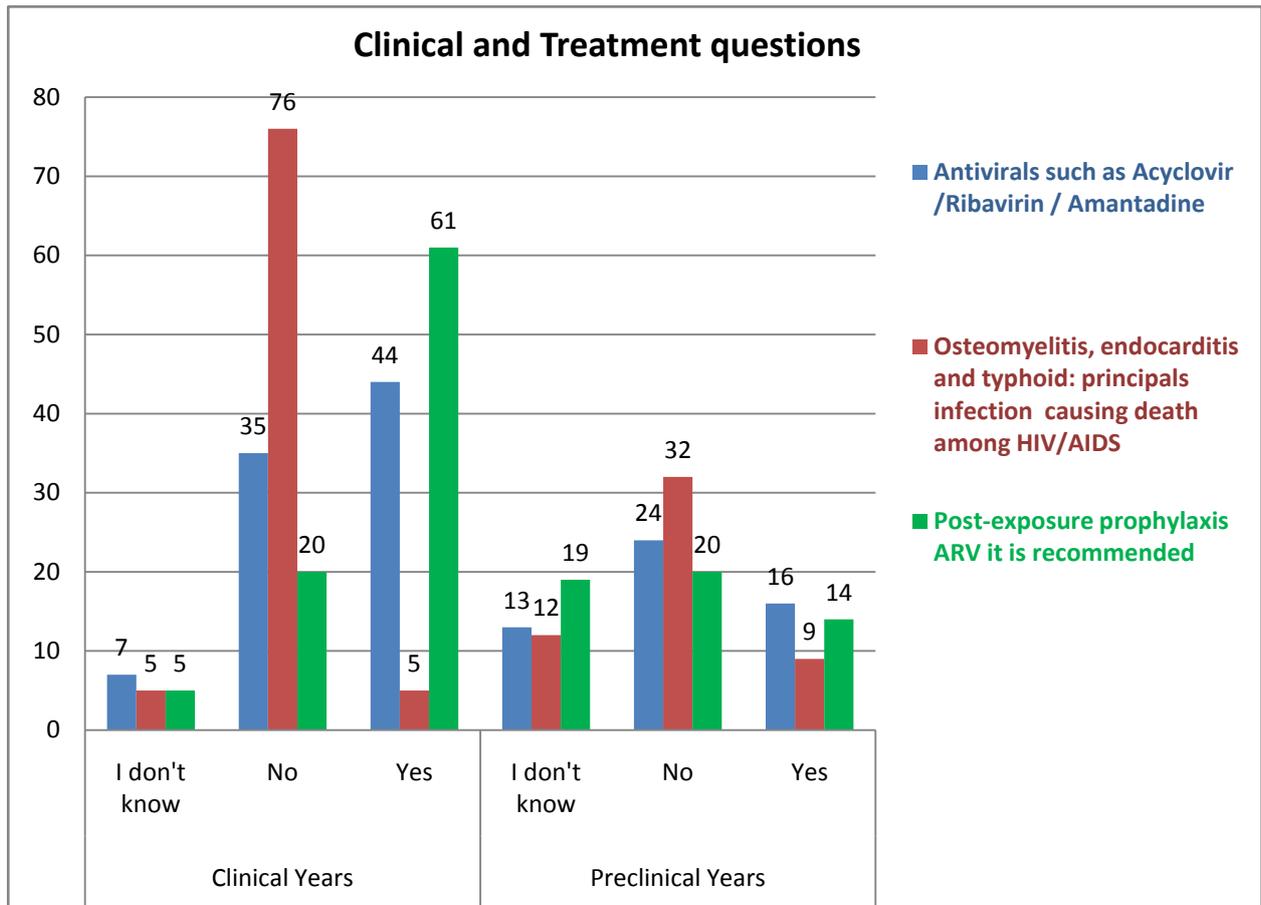


Figure 2. Proportion of responses on clinical and treatment questions

4. Discussion

Students in the Faculty of Health Sciences (Medicine, Biomedical Sciences, Public Health) considered as future health professionals must have sufficient knowledge on HIV/AIDS infection. HIV knowledge is a very useful tool for any intervention in the field of HIV, to assess the extent to which people living with HIV need to be cared for. HIV knowledge among students could play a major role in the health care system in the Republic of Congo. They represent the future doctors of the country.

Our study yielded encouraging results: there were more positive attitudes towards people living with HIV/AIDS. 93.7% of students said they wanted to work with people living with HIV/AIDS. Al-Rabeei et al, observed that about 64% of students expressed their willingness to work with people living with HIV/AIDS [39]. Another study indicated 52.8% of respondents with a desire to work in the same office with a person living with HIV/AIDS [40]. The negative attitude is certainly caused by the fear of being contaminated. The training of health professionals but also continuous training of care givers is essential to improve their attitude towards people living with HIV/AIDS and the quality of care.

The majority of students responded that T cells were defense cells that were affected by the HIV virus, and some thought that it takes 13 to 24 weeks for seroconversion to occur for HIV antibodies to be detectable. Students had a

good knowledge of HIV/AIDS-related lesions such as Kaposi's sarcoma, oral hair leukoplakia, and oral thrush. Clinical year students had greater knowledge compared to those in preclinical years. These answers demonstrate a lack of knowledge about the HIV virus; medical students should deepen their knowledge, especially on lesions strongly associated with HIV.

With the poor performance of correct answers to some questions by medical students, education leaders involved in defining university curricula should set up teaching units on the transmission of HIV/AIDS. This is a priority for any updating of the FSSA teaching programs and the education and care of people living with HIV/AIDS.

Most students in the Faculty of Health Sciences had an acceptable knowledge of HIV, but there were still students who did not have a good attitude towards HIV/AIDS. The majority of students thought they had the right to refuse to treat a patient with HIV/AIDS. Previous studies have found students with a positive attitude towards HIV [30,41]. However, for the low proportion of students with a negative attitude, it is necessary to examine the current educational components related to HIV/AIDS. Two negative attitudes attracted our attention: the difficulty of sympathizing with a person with HIV/AIDS (35.85%) and the fact of being disturbed if his classmate has HIV/AIDS (73.58%). Incorrect knowledge of HIV/AIDS breeds fear, and therefore rejection. The socio-cultural context also plays an important role in understanding these negative attitudes.

Ignorance and misunderstanding continue to undermine efforts to end HIV/AIDS. In the worst cases, discriminatory attitudes and behaviors are facilitated by punitive laws and policies [1]. In a study conducted in Malaysia, few respondents (7.1%) showed no sympathy for HIV-positive people [42]. HIV knowledge, empathy, and attitudes toward professional interaction with PLWA were raised by Rickles et al. as positive predictors of care for people living with HIV [43].

In our study, a minority of students believed that mother-to-child HIV transmission was 100% and could be transmitted through oral contact, urine, and feces. These responses show little knowledge of HIV transmission pathways among students. Rickles et al. revealed that over 70% of students reported that a person is at risk of contracting HIV through urine [43]. Students are poorly informed about the risk of HIV transmission.

5. Limitations of the Study

Some students communicated with each other and exchanged answers. It is possible that only one false answer was later repeated by the other students who cheated on the copies of their colleagues. The questionnaire was considered long by the students. Students got tired after a number of questions and could no longer be focused on the last answers of the questionnaire.

6. Conclusion

Although students' general level of knowledge about HIV/AIDS was appreciable, they had a number of well-crafted ideas about HIV/AIDS. There is a need to include HIV/AIDS knowledge training to elucidate not only learned concepts, but also to change the behavior of future health professionals with respect to HIV/AIDS patients. This study showed the importance for students to increase their knowledge of HIV/AIDS. Knowledge of the clinical signs, transmission and treatment of HIV/AIDS was moderate. Adequate training would improve the negative conception of the disease.

Recommendations

As a result of our study, it is clear that students should have an experience with people living with HIV in their first preclinical year. In HIV-related courses or training for students, they should be helped to overcome prejudices and increase their empathy for patients with HIV/AIDS. In order to minimize the discrimination experienced by people with HIV/AIDS, in medical settings, it is important to associate the national HIV/AIDS program with special sessions dedicated to the transmission of HIV/AIDS and HIV/AIDS promotion of universal precautions related to HIV/AIDS.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contribution

Laure Stella GHOMA LINGUISSI conceived of the study, participated in its design and coordination, conducted the acquisition, input and collection of data and the interpretation of data, and drafted the manuscript. Robin Noé ONGAGNA YOMBI re-read the document. Céline NKENFOU has critically reviewed and approved the manuscript. Jean Rosaire IBARA participated in the design of the study, validated the questionnaire. Both supervisors approved the final manuscript.

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