

Knowledge, Attitudes, and Practices of Adolescents Regarding Sexuality, Sexually Transmitted Infections, and Human Papillomavirus Vaccination in Libreville, 2022-2023

Ngou Mve Ngou Jean Pierre, Bouassa Mayombo Thierry, Ngou Mve Ngou Johan Kevin, Ambounda Nathalie, Dissanami Frederic, Mabicka Barthelemy

Gynecology-Obstetrics Department, University Hospital Center of Libreville, Libreville, Gabon
Email: ngoumvevou@gmail.com

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Abstract

Objective: Evaluate the knowledge, attitudes, and practices of adolescents regarding sexuality, sexually transmitted infections, and human papillomavirus vaccination. **Population and Method:** This was a cross-sectional, descriptive, and analytical study that took place from December 2022 to June 2023 in the public and private high schools of the municipalities of Libreville, Owendo, and Akanda, with ages ranging from 13 to 19 years living in the capital. Data collection was carried out using an anonymous questionnaire. The data were analyzed using SPSS version 20, 32-bit software. The chi-squared test was used to assess associations between variables; pairwise comparisons were performed. Prevalence ratios (PRs) with 95% confidence intervals were calculated, and statistical significance was set at $p < 0.05$. **Results:** At the time of this survey, 42.4% of adolescents reported being in a relationship; 85% of them had already had sexual intercourse. The age of the first sexual intercourse was between 10 and 15 years in 55.7% of them, and 64.6% reported condom use at first intercourse. Casual sexual intercourse was reported in 45.6% of them. The condom was used only in 59.7% of cases. The number of sexual partners ranged from 1 to 4 in the majority, or 69.2% of adolescents who were sexually active, and 9.5% had a history of STI. Knowledge of HPV vaccination was poor (score below 10/20) in adolescents of both sexes, *i.e.*, a score of 3.34/20 for adolescent boys, 4.20/20 for adolescent girls respectively, for an overall average score of 3.6/20. Finally, 5.7% of adolescents who knew about the existence of HPV vaccines had received at least one dose. **Conclusion:** In order to improve adolescents' knowledge of sexually

transmitted infections, awareness campaigns remain the preferred means in our context. These campaigns must be carried out using New Information and Communication Technologies, which are more accessible to these age groups.

Keywords

Knowledge, Behavior, Teenagers, STI, HPV Vaccination

1. Introduction

The World Health Organization (WHO) defines a Sexually Transmitted Infection (STI) as an infection that is transmitted during unprotected sexual intercourse [1].

In the world, the most common STIs are: gonococcal, chlamydia, hepatitis B, genital herpes, HPV infection, mycoplasma infections, trichomonas, and HIV infection [2].

In most cases, sexually transmitted infections are asymptomatic, and the clinical picture is often that of complications that involve the functional (tubal sterility) and vital (AIDS) prognosis.

In France, the most well-known STI among adolescents is HIV infection because, in this study, 85% of adolescents had good knowledge about it [3].

Indeed, the highest STI rates are usually found in young people aged 15 to 24. It is in this context that we carried out this work to evaluate the knowledge and behavior of adolescents regarding sexuality, sexually transmitted infections, and human papillomavirus vaccination in Libreville.

2. Population and Method

It was a cross-sectional, descriptive, and analytical study that took place from December 2022 to June 2023 in public and private high schools in the municipalities of Libreville, Owendo, and Akanda.

We targeted in-school adolescents who ranged between 13- and 19-years old living in the Gabonese capital because they are the most exposed section of the population to STIs, and they are the target of HPV vaccination.

- **Inclusion criteria:**

All teenagers aged 13 to 19 who were present in classrooms on the day of the survey and agreed to participate. All returned forms were included, even if partially completed.

- **Exclusion criteria:**

Adolescents younger than 13 years or older than 19 years old on the survey day, those absent during data collection, and those who refused to participate.

The survey sheet was an individual and anonymous questionnaire consisting of four sections: the first collected the sociodemographic data of adolescents; the second made it possible to evaluate the knowledge of adolescents on STIs and was made up of 32 questions; the third section described the sexuality and behavior of adolescents; and the last section finally evaluated the knowledge of adolescents in

relation to HPV vaccination and consisted of 7 questions.

Data were entered in CPro 6.3 and analyzed in SPSS Version 20. We computed means and standard deviation for quantitative variables and applied Pearson's chi-square test, with $p < 0.05$ considered statistically significant.

Sample size

The minimum sample size was determined for a single proportion with two-sided $\alpha = 0.05$, precision $d = 0.05$, using $N = Z^2 \times P(1 - P) / d^2$ with $Z = 1.96$. In the absence of a robust prior estimate for the target population, we used $P = 50\%$ (maximum variance), as recommended by WHO (Lwanga & Lemeshow).

Ethics

The approval was obtained from the National Ethics Committee of Gabon and the hospital. The confidentiality and anonymity of the patient were strictly respected, in accordance with the ethical guidelines, Decree 00732/PR/MRSDT of September 15, 2008, setting out the composition and functioning of the National Ethics Committee.

3. Results

For this study, 1,500 questionnaires were distributed, and 1,163 were recovered, including those incompletely completed, resulting in a participation rate of 78%. The average age of school adolescents was 16.6 years, with extremes of 13 years and 19 years. Sixteen- and seventeen-year-olds were the largest groups in our sample ($n = 232$ and $n = 234$, respectively).

Adolescents from single-parent families comprised 49.6% of the sample; 6.8% did not report their parents' marital status.

Table 1. Distribution of adolescents by knowledge of STIs.

Do you know STIs?	Numbers	Percentage (%)
AIDS	1099	94.5
Gonorrhoea	785	67.5
Syphilis	726	62.4
Chlamydia	601	51.6
Herpes	398	34.2
HPV	179	15.3
Hepatitis	8	0.6

HIV was the most commonly recognized STI: among adolescents who reported about STIs, 1099 (94.5%) named HIV (**Table 1**), followed by gonorrhoea (67.5%) and syphilis (62.4%). Television was the leading information source, cited by 45.7% of those aware of STIs. AIDS was also the STI that adolescents reported fearing the most. Testicular pain was the most frequently cited symptom of STI, mentioned by 224 adolescents (19.26%). Third-grade students were the largest subgroup, accounting for 38.8% of participants. Among 935 adolescents, 74.4% were unaware of HPV; only 159 knew about the HPV vaccine, and 5.7% had received at least one dose. The mean HPV knowledge score was 3.6/20. The HPV-

cervical cancer link was not known to 61.3% of adolescents.

Pharmacies were the commonly cited source of condoms, reported 948 times (81.5%) among adolescents aware of STIs. A majority (711; 61.1%) believed they knew at least one route of STI transmission. Unprotected sexual intercourse was the route most frequently mentioned by 687 adolescents (96.6%) of those claiming such knowledge. Condom use at first intercourse was reported by 64.6% of sexually active adolescents. There was no significant association between parents' marital and the age at first sexual intercourse ($p = 0.077$; **Table 2**).

Table 2. Age at first sexual intercourse by parents' marital status among adolescents.

Age at 1 st sexual intercourse	Parents' Marital Status			P
	Single parent Family N (%)	Biparental Family N (%)	Total N (%)	
<13	0(0.0)	2(1.1)	2(0.5)	0.077
13 - 15	127(52.9)	111(60.0)	238(56.0)	
16 - 19	113(47.1)	72(38.9)	185(43.5)	
Total	240(100.0)	185(100.0)	425(100.0)	

Parents' occupational category (OC) was not significantly associated with adolescents' age at sexual debut ($p = 0.128$; **Table 3**).

Table 3. Age at first sexual intercourse by parents' occupational category. (OC)

Age at 1 st sexual intercourse	Occupational Category					P
	OC1 N(%)	OC2 N(%)	OC3 N(%)	OC4 N(%)	Total N(%)	
<13	3 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)	3 (0.7)	0.128
13 - 15	72 (55.0)	119 (59.2)	21 (47.7)	29 (50.0)	241 (55.5)	
16 - 19	56 (42.7)	82 (40.8)	23 (52.3)	29 (50.0)	190 (43.8)	
Total	131 (100.0)	201 (100.0)	44 (100.0)	58 (100.0)	434 (100.0)	

Nearly all adolescents (98.8%) had low knowledge of STIs. STI knowledge did not differ significantly by parents' occupational category ($p = 0.183$). The mean STI knowledge score was 5.6/20.

4. Discussion

Limitations of the study:

This study was conducted in public and private schools in Libreville; results may not generalize to adolescents who are out of school. Questionnaires were completed in classrooms on the day of data collection, where privacy was difficult to ensure, potentially introducing social desirability and reporting biases. Because sexuality remains a sensitive topic in this setting, many adolescents may rely primarily on mass media for information, which could have influenced their answers. Regarding sexual debut, some adolescents reported first intercourse before age 15, 64% between 15 - 18 years, and nearly 3% after 18 years, suggesting an early onset of sexual activity in this context (and possibly earlier than in other countries).

In France, outcomes appear more favorable: in Grondin *et al* [4], most adolescents reported using contraception at first intercourse, with male condoms as the preferred method.

Consequently, condom use appears to be declining among Gabonese adolescents, potentially increasing the risks and adverse consequences of unprotected sexual activity.

In Morocco, El Yahyaoui *et al.* [5] reported a different pattern: while HIV remained the best known STI among adolescents, syphilis ranked second and gonorrhea third. In urban Casablanca, adolescents who had heard of at least one STI most frequently cited AIDS (95.8%), followed by syphilis (56.8%) and gonorrhea (38.6%); in a semi-urban area of Marrakech, the corresponding proportions were 94.2%, 44.3%, and 32.9%, respectively. In Switzerland, Beck *et al.* [6] found higher awareness levels: 93% had heard of HPV and 88% knew about the vaccine, likely reflecting school-based vaccination campaigns, whereas in our setting, efforts are still focused on raising awareness. In France, Curry *et al.* [7] reported that 49% of girls had received ≥ 1 HPV dose in 2012; among those vaccinated, nearly two-thirds did so mainly on the advice of a physician or parents, consistent with Blumberg *et al.* [8]. In our sample, practical attitudes score towards STIs averaged 5.2/20, indicating poor overall adherence to recommend practices and limited engagement with STI awareness campaigns.

Regarding HPV vaccination coverage in France, Lerais *et al.* [9] estimated 47% for at least one dose in 2013, but other reports indicate substantially lower national coverage (17.2%), with Bruni *et al.* [10], and Goldie *et al.* [11] citing even lower figures. Parents' marital status was not associated with the age at first sexual intercourse among adolescents ($p = 0.77$).

5. Conclusion

In this survey in Libreville assessing adolescents' knowledge, attitudes, and practices regarding sexuality, STIs, and HPV vaccination, adolescents showed low overall knowledge of STIs and HPV, and risky sexual behaviors persisted across sexes. HPV vaccination coverage was very low in our sample. To strengthen adolescent knowledge and prevention, targeted awareness campaigns remain the preferred strategy in this context and should be delivered through digital and social platforms that are widely accessible to this age group.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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