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Original Article

HIV infections in youth: prevalence and associated factors*

Infecção pelo HIV em jovens: prevalência e fatores associados

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ABSTRACT

Objective: to estimate the prevalence and associated factors with Human Immunodeficiency Virus (HIV) infection in youths. **Methods:** cross-sectional study in two Centers for Testing and Counseling, with 279 youths from 15 to 24 years old. An anti-HIV test and a structured instrument were applied. We used bivariate analysis and logistic regression, with Bonferroni corrections, to investigate the association between the variables and the outcome. **Results:** the prevalence of HIV in the youth analyzed was 3.9% (Confidence interval - CI95%: 1.0-10.1). The association with the outcome of HIV was statistically significant in male youth (p=0.001), homosexuals (p<0.001), those who tested due to sexual exposure (p=0.034), perception of a high risk of acquiring HIV (p=0.002), and anal sex (p=0.004). Homosexual youth (odds ratio-OR=13.46; CI95%;1.14-15.84), with a perception of high risk of acquiring HIV (OR=18.11; CI95%: 2.28-143.69) had a higher chance of being HIV positive. **Conclusion:** the prevalence of HIV and associated factors in youth was ascertained. **Contributions to practice:** the information produced here shows evidence for those who aim to formulate policies, including health managers and workers. It can give support to the elaboration of strategies that involve perfecting preventive, coordinated actions, adjusted to behavioral contexts in the settings studied.
Descriptors: HIV Seroprevalence; Adolescent Behavior; Young Adult; Health Risk Behaviors; Cross-Sectional Studies.

RESUMO

Objetivo: estimar a prevalência e fatores associados à infecção pelo *Human Immunodeficiency Virus* (HIV) em jovens. **Métodos**: estudo transversal, realizado em dois Centros de Testagem e Aconselhamento, com 279 jovens entre 15 e 24 anos. Realizou-se teste anti-HIV e aplicou-se instrumento estruturado. Empregaram-se análise bivariada e regressão logística com correção de Bonferroni para investigar a associação entre as variáveis e o desfecho sorológico. **Resultados:** a prevalência de HIV entre os jovens foi de 3,9% (Intervalo de confiança-IC95%: 1,0-10,1). A associação com o desfecho HIV mostrou-se estatisticamente significante entre jovens do sexo masculino (p=0,001), homossexuais (p<0,001), exposição sexual como motivo do teste (p=0,034), percepção de alto de risco de adquirir HIV (p=0,002) e prática de sexo anal (p=0,004). Jovens homossexuais (*Odds ratio*-OR=13,46; IC95%:1,14-15,84) e com percepção de alto risco de adquirir o HIV (OR=18,11; IC95%: 2,28-143,69) tiveram maiores chances de apresentarem resultado positivo para HIV. **Conclusão:** foi possível identificar a prevalência e fatores associados ao HIV em jovens. **Contribuições para a prática:** as informações geradas podem disponibilizar evidências aos formuladores de políticas, gestores e profissionais de saúde, e subsidiar a elaboração de estratégias que contemplem o aperfeiçoamento das ações de prevenção, coordenadas e ajustadas aos contextos comportamentais nos cenários estudados.
Descritores: Soroprevalência de HIV; Comportamento do Adolescente; Adulto Jovem; Comportamentos de Risco à Saúde; Estudos Transversais.

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Introduction

In the last decades, the worldwide setting caused optimism concerning the perspective of dealing with the Human Immunodeficiency Virus (HIV) epidemic. Although there has been a decrease in the worldwide trend of new HIV infections, it should be noted that different population groups are not similarly vulnerable or equally affected, as there are different settings, depending on local contexts and age groups[1-2].

The increase in HIV infections, especially in key-population youths, indicates how limited the policies, services, and actions to prevent HIV and the acquired immunodeficiency syndrome (aids) are. Estimates suggest that, from 1.57 million new infections in 2020, 27% are among the young, that is, from 15 to 24 years old. This group, according to the World Health Organization is divided in young adolescents (15 to 19 years old) and young adults, from 20 to 24 years old (WHO)[1-4]. Countries such as China[5], India[6], Republic of Korea[7], the United States, Uganda, Mozambique, South Africa, Namibia[1,3], and others, stand out as places where infections in this age group are increasing.

In Brazil, from 2007 to June 2022, 102,869 (23.7%) of new HIV cases affected youths from 15 to 24 years old, with 25.2% in males and 19.9% in females. Regarding its incidence, in 2021, there were 40,880 notified cases of HIV infection. 9,555 of them (23.4%) affected youths from 15 to 24 years old. Also, from 2010 to 2020, there was an increase of 15 and 31%, respectively, in the groups from 15 to 19 and from 20 to 24[4].

In the last 10 years, a total of 52,513 youths from 15 to 24 years old, who were living with HIV, progressed into aids. In Paraíba, the detection rates in youths increased from 5.4/100 thousand people in 2010 to 9.3/100 thousand people in 2020 - a 68% increase. In the largest cities in the state - João Pessoa and Campina Grande -, detection rates in 2020 were, respectively, 23.0 and 8.6 per 100 thousand people[1,4].

Despite the disproportional HIV rates among youths, they continue to struggle against political and legal barriers regarding their age, discrimination, and exclusion, making it harder to access health services and to guarantee sexual and reproductive rights, as well as the access to damage reduction and the services for care associated with the virus. Insufficient resources and inadequate focus on the prevention of new infections, restricted access to foods, education, and housing, high levels of violence, multiple partners, low HIV testing rates, alcohol and drug abuse, inconsistent use of condoms, and sex work[4,8-9] produce a context where many underlying causes of the infection can intersect.

Most youths who live with HIV are from vulnerable populations - homosexuals, men who have sex with other men (MSM), trans persons, sex workers, and injectable drug users[1,10-13]. These specificities mean that the situation of the youths is a focus for debate and reflection and highlight how complex and diversified are the demands of this population. This context is added to top of cultural and communitarian norms, gender differences, and other power asymmetries that prevent people and groups from carrying out their rights and reduce their ability to protect themselves consistently against HIV infections[5,8,10,13].

Still, contextual variations (demographic, political, cultural, economic, educational, geographical) can influence interpersonal processes and individual behavior, and, sometimes, complicate the adoption of safe sexual practices that could prevent HIV transmission[10-13].

Our challenge, therefore, is to encourage approaches that consider the multiple overlapping vulnerabilities that affect youths and their different needs based on their age and specific behavior, and on the complexities of their environment and the epidemic[10,14]. Understanding the particularities of this

social group better, as identified in local contexts, can be an opportunity to characterize predominant and/or unique epidemiological standards, contributing to improve practices and overcome gaps in prevention[2,13-14].

Thus, in accordance with a global demand for studies targeted at local/regional specificities[1,3-4], this study selected two cities from Paraíba to estimate the prevalence and associated factors with Human Immunodeficiency Virus infection in youths.

Methods

Cross-sectional study using the directives for observational studies by Strengthening the Reporting of Observational Studies (STROBE) and developed in two Centers for Testing and Counseling for HIV and aids, in the cities of João Pessoa and Campina Grande, main cities of two health macro-regions with the highest demographic densities in the state of Paraíba.

João Pessoa (population 825,796) and Campina Grande (population 413,830) are home to most industrial, economic, technological, political-administrative, and health care activities in the state. They are important educational zones, grouping most public and private universities, which causes a permanent flow of youths. Attending to recommendations from the Operational Management of Chronic Conditions and Sexually Transmissible Infections (STIs) from the state of Paraíba, these cities were selected because they counted on strategically located Centers for Testing and Counseling, one in the capital, and another in the country, recording a larger flow of users by spontaneous demand[15].

The study population was formed by youths from 15 to 24 years old who visited the Centers for Testing and Counseling to undergo quick HIV tests. The sample universe was calculated based on the mean monthly estimate of HIV tests in these services (João Pessoa, n = 500; Campina Grande, n=320), with a significance level of 5%, a confidence level of 95%, and a predicted prevalence value based on the detection rate of cases of aids in youths (João Pessoa, prevalence = 23.0%; Campina Grande, prevalence = 8.6%)[3-4]. Thus, the minimal sample was 279 participants: 181 youths from João Pessoa and 98 from Campina Grande.

To select participants, we adopted the voluntary participation (by convenience), using as inclusion criteria: age from 15 to 24 years old, and unknown status regarding HIV infection.

The youths were recruited by the researchers when they filled in the pre-test attention form, which is when they were informed by the research. Then, they were referred to the testing room, where health workers carried out the quick HIV test. In the services studied, lateral flow immunochromatographic assays were used, which allow the detection of specific antibodies for HIV-1, group O, and HIV-2. For a result to be considered positive for HIV, two quick tests (from different manufacturers) were used in sequence, with blood samples collected via fingerstick. The results were made available to the youths by the health workers in a post-test counseling session, which was individual and private, in accordance with the protocols from the Ministry of Health[16].

The time between the execution of the text and the availability of the results was enough for the interview to take place. The youths who accepted participating were conducted into a private room, where they were informed of the importance of the study, its objectives, risks, and benefits.

Data collection took place from February to June 2021 and was carried out by post-graduates (MSs and PhDs), adequately trained by the study coordinator. We also applied a structured instrument, elaborated by the Center for Studies in HIV and Aids, Health, and Sexuality, associated with the post-graduation program in nursing at the Universidade Federal da Paraíba, where the items were defined according with an integrative review[17], which was used to artic-

ulate it to global directives of the struggle against HIV and aids[1-4].

The instrument included sociodemographic (age, sex, residence, sexual guidance, self-declared color, educational level, current occupation, and monthly family income) and behavioral variables (1st time seeking HIV testing, Reason for the current test, Age of first sexual intercourse, Current relationship, Status of the current relationship, Sexual practices, Sex in exchange for benefits, Frequency of the use of condoms in sexual intercourse, Difficulties negotiating the use of the condom with partners, Perception of the risk of acquiring HIV, Partner status regarding HIV infection, Use of post-exposure prophylaxis (PeP), Use of pre-exposure prophylaxis (PrEP), Alcohol use, Illegal drug use.

After the interview, participants were conducted to the post-test counseling room, where they were informed of the results of the quick test and received other guidance. At this time, the result (positive or not), with the permission of the participant, was inserted in the collection instrument created by the collectors.

The prevalence of HIV, investigated according with positive quick test results, was calculated using a confidence interval (CI) of 95%. The testing outcome (positive or negative) was considered to be a dependent variable, while sociodemographic and behavioral variables were considered to be the independent ones.

Data analysis was carried out using descriptive and inferential statistics in the software Stata, version 12. Qualitative variables were expressed in absolute and relative frequencies. To investigate the association between sociodemographic and behavioral variables and the positive results in HIV tests, we carried out a bivariate analysis using Pearson's chi-squared and Fisher's exact, including the application of a *post-hoc* test (Bonferroni correction) for the statistically significant variables ($p<0.05$) and more than two categories.

The variables that presented a significance level of $p<0.20$ were simultaneously included in the logistic regression model, creating odds ratios (OR) with CI 95%. Using the backwards method, non-significant variables were excluded, and the final model only included variables with statistically significant associations with $p<0.05$.

The research was approved by the Research Ethics Committee at the Universidade Federal da Paraíba under Certificate of Submission for Ethical Appreciation nº 29413620.5.0000.5188 and opinion nº 3,935,713/2020, in accordance with Resolution 466/2012 from the National Council of Health, which regulates research with human beings in Brazil. Those who accepted participating were asked to provide written consent or to sign via fingerprint a Free and Informed Consent Form when they were older than 18, and to provide an Assent Form when they were younger than 18.

Results

In the sample studied (n=279) most participants were youths from 20 to 24 (71.0%), females (50.2%), heterosexuals (58.4%), brown-skinned (53.8%), complete high school (60.9%), with a formal job (33.0%), and a monthly family income from one to three minimum wages (55.4%). The prevalence of HIV was 3.9% (CI95%:1.0; 10.1), corresponding to 11 youths with a positive result in the quick test.

Table 1 shows the bivariate analysis of the sociodemographic characteristics and their associations with the positivity of the quick test for HIV. Regarding the quick test outcome (HIV), there was a significant difference concerning the variables sex ($p=0.001$) and sexual orientation ($p<0.001$). Among male youths, the prevalence was 7.9%, and, among homosexuals, 13.9%. There were positive results in the HIV quick tests for women or heterosexual persons.

Table 1 – Association of sociodemographic characteristics of the youths according with the outcome of the HIV quick test (n=279). João Pessoa/Campina Grande, PB, Brazil, 2021

Variables	HIV quick test		p-value*
	Positive (n=11) n (%)	Negative (n=268) n (%)	
Age (years)			0.185†
15-19	1 (1.2)	80 (98.8)	
20-24	10 (5.0)	188 (95.0)	
Sex			0.001‡
Male	11 (7.9)	128 (92.1)	
Female	–	140 (100.0)	
City of residence			0.055†
João Pessoa	4 (2.2)	177 (97.8)	
Campina Grande	7 (7.1)	91 (92.9)	
Sexual orientation			< 0.001†
Heterosexual	–	163 (100.0)	
Homosexual	10 (13.9)	62 (86.1)	
Bisexual/pansexual	1 (2.3)	43 (97.7)	
Self-declared skin color			0.319†
White	3 (3.9)	74 (96.1)	
Brown	8 (5.3)	142 (94.7)	
Black	–	50 (100.0)	
Other	–	2 (100.0)	
Educational level‖			0.223†
LowLow	–	26 (100.0)	
Medium	5 (2.9)	165 (97.1)	
High	6 (7.2)	77 (92.8)	
Current occupation			0.583†
Student	4 (4.4)	86 (95.6)	
Employed	3 (3.3)	89 (96.7)	
Studies and works	3 (9.1)	30 (90.9)	
Others (unemployed, housework, retired)	1 (2.7)	63 (100.0)	
Monthly family income (minimum wages)			0.819†
≤ 1	3 (3.4)	85 (96.6)	
> 1 to ≤ 3	6 (3.9)	147 (96.1)	
> 3	2 (5.7)	33 (94.3)	

*Chi-squared test (x^2) or Fisher's exact; †Fisher's exact; ‡(x^2); ‖Low educational level: incomplete elementary school; medium educational level: complete elementary school, incomplete or complete high school; high educational level: incomplete or complete higher education; HIV: human immunodeficiency virus

In the analysis of the association between behavioral variables and test outcomes (HIV), the reasons for the current test (p=0.034), the perception of risk of acquiring HIV (p=0.002) and the sexual practices (p=0.004) were statistically significant (Table 2).

Table 2 – Association between behavioral factors and HIV test outcomes (n=279). João Pessoa/Campina Grande, PB, Brazil, 2021

Variables	HIV quick test		p-value*
	Positive (n=11) n (%)	Negative (n=268) n (%)	
1st time seeking HIV tests			0.211†
Yes	2 (1.8)	107 (98.2)	
No	9 (5.3)	161 (94.7)	
Reason for the current test			0.034†
Sexual exposure	7 (8.6)	74 (91.4)	
Curiosity	1 (5.9)	16 (94.1)	
Periodical exam	2 (3.8)	51 (96.2)	
Infection or comorbidity	1 (5.9)	16 (94.1)	
Others‡	–	111(100.0)	
Age during first sexual intercourse§ (years)			0.731†
< 12	–	8 (100.0)	
≥ 12 a ≤ 18	9 (3.9)	224 (96.1)	
> 18	2 (6.5)	29 (93.5)	
Current relationship§			0.134†
Yes	6 (2.8)	208 (97.2)	
No	5 (7.8)	59 (92.2)	
Current relationship status‖			0.280†
Stable	3 (1.9)	156 (98.1)	
Casual	3 (5.5)	52 (94.5)	
Sexual practices§			0.004†
Receptive anal sex	9 (7.9)	105 (92.1)	
Insertive anal sex	2 (4.1)	47 (95.9)	
Oral and/or vaginal sex	–	112 (100.0)	
Sex in exchange for benefits			0.086†
Yes	3 (10.7)	25 (89.3)	
No	8 (3.2)	243 (96.8)	
Frequency of condom use§			0.365†
Always	4 (6.9)	54 (93.1)	
Sometimes	6 (3.9)	149 (96.1)	
Never	1 (1.6)	61 (98.4)	
Difficulties negotiating the use of condoms with partner§			0.512†
Always	–	28 (100.0)	
Sometimes	4 (6.0)	63 (94.0)	
Never	7 (4.0)	170 (96.0)	
Parception of risk of acquiring HIV			0.002†
Low	2 (1.2)	163 (98.8)	
Moderate	1 (2.4)	40 (97.6)	
High	2 (18.2)	9 (81.8)	
Does not know	6 (9.7)	56 (90.3)	
HIV status of current partner‖			0.499†
HIV negative	2 (2.0)	100 (98.0)	
HIV positive	-	3 (100.0)	
Does not know	4 (3.7)	105 (96.3)	
Previous STI diagnosis			0.457†
Yes	4 (6.8)	55 (93.2)	
No	7 (3.4)	201 (96.6)	
Does not know	–	12 (100.0)	
Post-exposure prophylaxis			0.087†
Yes	2 (15.4)	11 (84.6)	
No	9 (3.4)	257 (96.6)	
Pre-exposure prophylaxis§			1.000†
Yes	-	1 (100.0)	
No	11 (4.0)	266 (96.0)	
Alcohol use			1.000†
Yes	6 (3.7)	154 (96.3)	
No	5 (4.2)	114 (95.8)	
Illegal drug use			0.531†
Yes	5 (5.0)	95 (95.0)	
No	6 (3.4)	173 (96.6)	

*Fisher's exact; †Fisher's exact; ‡Pregnancy/weight loss/partner with STI/work accident; §No information was found regarding the total number of users; ‖youths who self-declared "no relationship" were excluded; HIV: Human immunodeficiency virus; STIs: Sexually transmissible infections

An application of the Bonferroni correction in the two independent variables with more than two categories and with significant associations found statistically significant differences regarding the prevalence of HIV between homosexual and heterosexual persons (p≤0.001); between those who were testing due to sexual exposure and others (p=0.002); between those who performed receptive anal sex and those who performed oral/vaginal sex (p=0.003); and between those who perceived themselves as having low risk of acquiring HIV and those who stated they did not know (p=0.006) (Table 3).

Table 3 – Multiple comparisons regarding Sexual orientation, Reason for the current test, Sexual practices, and Perception of the risk of acquiring HIV, according with Bonferroni correction. João Pessoa/Campina Grande, PB, Brazil, 2021

Variables	Bonferroni correction
Sexual orientation	
Heterosexual/Homosexual	<0.001†
Heterosexual/Bisexual-pansexual	0.213
Homosexual/Bisexual-Pansexual	0.050
Reason for the current test	
Sexual exposure/Curiosity	1.000
Sexual exposure/Periodical examination	0.482
Sexual exposure/Infection or comorbidity	1.000
Sexual exposure/Others*	0.002†
Curiosity/Periodic exam	1.000
Curiosity/Infection or comorbidity	1.000
Curiosity/Others*	0.133
Periodical exam/Infection or comorbidity	0.100
Periodicam exam/Others*	0.103
Infection or comorbidity/Others*	0.133
Sexual practices	
Receptive anal/insertive anal	0.508
Receptive anal/Oral and/or vaginal	0.003†
Insertive anal/Oral and/or vaginal	0.091
Parception of risk of acquiring HIV	
Low/moderate	0.488
Low/High	0.020
Low/Does not know	0.006†
Moderate/High	0.110
Moderate/Does not know	0.239
High/Does not know	0.598

*Pregnancy/weight loss/partner with STI/work accident; HIV: Human immunodeficiency virus; †Significant variables according with Bonferroni correction

To control potential confounding factors, after the bivariate analysis, the sociodemographic and behavioral variables with p<0.20 were inserted in the logistic regression model. After an adjusted analysis, the following variables showed a statistical association with a positive HIV test result: sexual orientation and perceived risk of acquiring HIV. Homosexual youths (OR=13.46; CI95%;1.14-15.84), and those with a high perception of their risk of acquiring HIV (OR=18.11; CI95%: 2.28-143.69) were, respectively, 13 and 18 times more likely to have a positive result in the HIV quick test (Table 4).

Table 4 – Odds ratio regarding the significant variables pointed out by the logistic regression as associated with a positive HIV quick test in youths. João Pessoa/Campina Grande, PB, Brazil, 2021

Variables	Odds Ratio	CI 95%	p-value*
Sexual orientation†			
Homosexual	13.46	1.14 – 15.84	0.039
Bisexual/pansexual	1‡	–	–
Parception of risk of acquiring HIV			
Low	1‡	–	–
Moderate	2.03	0.18 – 23.03	0.565
High	18.11	2.28 – 143.69	0.006
Does not know	8.73	1.71 – 44.51	0.009

*Significant result with p<0.05; †The heterosexual category was excluded as it presented no positive HIV cases; ‡Reference value; HIV: Human Immunodeficiency Virus; CI: Confidence interval

Discussion

In this investigation, although we worked with a sample of youths from 15 to 24 years old, from both sexes, focusing on a state in the Northeast, the prevalence found (3.9%) indicates a significant epidemiological situation, which should be considered in an analysis of potential responses to HIV.

In Brazil, male youths show a prevalence of 0.12%. Regionally, the prevalence of HIV in Brazil is of 0.15% in the Northeast, 0.24% in the North[18], 2.2% in the Southeast[19], and 2.1% in the South[20]. In this regard, the variation in the prevalence and the con-

sequent dispersion of the HIV epidemic among youth is disproportion in the country, in a larger or smaller scale, with regional differences. This requires new responses from surveillance systems and from the HIV and aids health care network[18,20].

Another element found by our study was the predominance of males with positive HIV cases. Literature shows a yearly growth of 3.7% in the Brazilian youth from 2000 to 2018[11]. We also found that, in 2021, the ratio among genders, considering the infected among youths from 15 to 24 was of 36 men for every 10 women[4]. This trend was also found in developed countries, such as Panama, with 0.4% of women and 1.0% of men[21], and in Republic of Korea, with 1.19% of cases in males and 0.17% in females[7].

Worldwide, the male population still faces programmatic, social, and behavioral vulnerabilities, that can include, among youths, trouble accessing specialized services and protective equipment, structural and gender violence, homophobia, feelings of omnipotence and invulnerability, trouble making decisions, undefined identities, need for group affirmation, absence of self-care and safety in sexual relationships, and alcohol and other drugs. In synthesis, the current vulnerability in the youth is part of a complex network of determinants that requires the induction of new technologies of intervention and care, coordinated and adjusted to specific needs of this age group[5,8-13] In the meantime, it should be noted that seeking innovative and individualized answers that can fill in the gaps in HIV services, where results are more relevant in males, can, consequently, maximize the protection of female youths against HIV[1].

Together with the predominance of HIV cases in male youths, there has been a concentration of cases in youths who self-declare as homosexuals (13.9%), whose chance of a positive quick test for HIV is 13 times higher. In Brazil, a cross-sectional investigation carried out in the applications Grindr, Hornet, and Facebook, with youths who are considered to be men who have sex with other men, found a self-reported HIV prevalence of 7.7%[22]. Another international investigation showed more prevalence of HIV cases in youths who reported anal bleed, recreational drug use, syphilis, and herpes simplex 2 (HSV-2) infections. Still, the prevalence (5.4%) was lower than our findings here[23]. The concentration of HIV cases is still a challenge for prevention strategies, regarding the limitations of people in this population group to assume safe sexual behaviors[1,3,23]. However, even in other countries, which have shown improvements in HIV prevention, members of key-populations are not equally receiving the benefits from preventive measures, showing that we must consider access inequality in the struggle against this epidemic[1].

It should be noted that, although the prevalence of HIV in this study was not associated to youths who self-declared heterosexual, nearly 60% of those who sought the quick test were heterosexual. This specificity can be a sign of frequent sexual exposure in these youths, regardless of sexual orientation. In the meantime, a research carried out with heterosexual men found that its interviewees did not think they were at risk of acquiring HIV because they were not homosexual and/or users of injectable drugs. Still in this regard, the use of categories to prioritize groups known to be more vulnerable can contribute to neglecting other population segments, since these groups can be diverse regarding other factors, such as color, social class, multiple sexual partners, and drinking, which can also contribute for vulnerability to the infection[24].

There must be a specific look towards this population who seeks testing and visibility in the context of the aids epidemic[20,24]. In regard to behavioral factors, a higher HIV prevalence was found in youths who informed they had been penetrated during anal sex. A research carried out in 12 Brazilian capitals, involving 4,176 men who had sex with men, showed that asymmetrical relationships based on power which is reflected on sexual positions difficult the negotiation of adherence to safe sexual behavior on the part of those who are penetrated[25]. Especially when unprotected, passive anal sex increases the risk of HIV transmission.

Furthermore, it stands out that, among youths, especially in men who have sex with other men, the use of the internet and multimedia applications as a territory of sociability and a mediator of contacts increases social interactions and the potential exposure to unsafe sexual practices[26].

These circumstances are made worse when followed coupled with a limited self-perception of risk of an HIV infection. In this research, nearly 60% of the youths showed a relatively low perception of risk. Although, considering Bonferroni's correction, there was a statistical difference between those who informed little perception of acquiring HIV and lack of knowledge, it must be remarked that, among those who perceived being under a high-risk to infection, 18.2% presented a positive result. They were 18 times more likely to present a positive quick test for HIV. This can be related with frequent attitudes and practices that put them at risk, considering that, in this investigation, a higher prevalence of HIV was also found among youths who mentioned "sexual exposure" as a reason for their test. Additionally, we found that 60.9% of the total sample had undergone quick tests for HIV. From these, 5.3% had a positive result in the quick test.

These elements show important reflections regarding the effectiveness of addressing professionals in the Centers for Testing and Counseling. This test is highly recommended as a means of avoiding a late detection of HIV; if, on one hand, its frequent use may encourage the continuity of unsafe practices, it also encourages testing as a form of prevention and health care. The perception of the risk of acquiring HIV and the routine use of the test could be associated with favorable norms of testing and a lower stigmatization of people who have HIV and aids. Nonetheless, it should be noted that dialogue among, programs, professionals, and the groups most affected by this disease is essential for the construction of answers to deal with the pandemic. Overcoming organizational barriers focusing on youths more vulnerable to being exposed to the infection, reorganizing attention flows to discover those who continuously seek the service for retesting, and training workers to avoid embarrassment when discussing sexual practices are essential elements for an active testing in the routine of the services[27].

Particularly, regarding risk perception, an analysis in 29 cities in the Brazilian territory found that youths from 18 to 24 years old, homosexuals, with stable partners, abusive drinking, STI reports, and previous tests were associated with a higher chance for risky behavior. Nonetheless, 60% of them do not see themselves as being under a high risk of HIV infections[28]. Similar results were found, according to which youth MSM had a high risk of acquiring HIV, a false perception of low risk, and a reduction in the rate of involvement in care. However, they showed a considerable rate of testing and accepting counseling[29].

It should be noted that a low perceived risk of HIV can lead to a dissonance between sexual behavior and knowledge about forms of transmission. Despite studies that indicate low risk perception to HIV[28-29], investigations in other settings and contexts are necessary, since structural factors can determine and differentiate the way in which youths access information. This is not only associated to educational level, but also to the way information can actually impact self-care. As this research shows, 90.7% of youths had from medium to high educational levels, and HIV mostly affected youths with high educational levels.

The time trend in different population groups indicates an increased incidence of HIV in persons with medium or high educational levels[20]. An explanation for this finding may be that younger individuals, even those with higher educational levels, can be more unafraid in regard to HIV and/or optimistic when it comes to treatment and preventive strategies, when compared to older persons. However, they are no different when it comes to perceived risk of infection[28,30].

Another important sociodemographic element, despite its lack of statistical significance, is the concentration of positive HIV cases in youths from 20 to 24 years old. In Brazil, in the last 10 years, this age group represented, in men an increment of 31% in the rates of HIV detection[4]. However, youths who

are 20 years old or older also represented nearly 70% of those who sought testing in this investigation. Test access limitations, the reduction in the search for younger individuals, and late tests can be factors associated with late HIV diagnoses in this age group. It is also important to reflect about the emphasis given to testing strategies for youths from 15 to 19 years old, to provide them with adequate opportunities for diagnosis and treatment[24,27-30].

The data presented here show how urgent it is to develop specific strategies, focusing on regions where youths are inserted and in local limitations that mean they are more vulnerable. Therefore, the current emphasis of HIV Care Policies in the age group studied is put into question, as are potential limitations of the youths, as they assume risk behaviors when it comes to preventive measures.

Considering the importance of the capillarization of research to develop knowledge and elaborate approaches to respond to the idiosyncrasies of youths, we recommend further investigation to be carried out, addressing youths in other research settings to take better advantage of socially and/or structurally different groups, crating effective responses to deal with the HIV epidemic in this population segment.

Study limitations

A limitation of this study was its use of a sample by convenience. In general, cross-sectional studies discuss general HIV prevalence or key-population groups, which limited the comparison with other population segments throughout the study.

We would also like to point out that user demand was low in the Centers for Testing and Counseling due to the epidemiological setting of the new coronavirus (COVID-19), which required restriction to maintain biosafety in the services.

Contributions to practice

The information produced here can make available evidence for those who aim to formulate policies, including health managers and workers. It can also give support to the elaboration of strategies that involve perfecting preventive, coordinated actions, adjusted to behavioral settings. In addition, they highlight the importance of valuing the training of health care network workers, especially in the Centers for Testing and Counseling, in order to promote testing and counseling services adequate to the idiosyncrasies of the young population.

We also expect this study to contribute for a more precise directing of actions and programs targeted at male, homosexual youths, who search multiple times for HIV tests and report sexual exposure as the reason for the current test, requiring a more sensitive approach, focused on local/regional specificities.

Conclusion

The prevalence of HIV in the youths investigated was 3.9% and was associated with males, self-declared homosexuals, with a self-perception of high risk of acquiring HIV, who practiced receptive anal sex, and mentioned sexual exposure as the reason for the current test.

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Authors' contribution

Concept and project or analysis and interpretation of data; writing of the manuscript or relevant critical revision of the intellectual content; and final approval of the version to be published; and agreement to be responsible for all aspects of the manuscript: Silva JKB, Queiroga RPF, Leadebal ODCP, Nogueira JA.

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