Adolescents’ knowledge of HPV and sexually transmitted infections at public high schools in São Paulo: A cross-sectional study

Jose Maria Soares Junior, Hervillin Maria Creusa de Oliveira, Camilla Maganhin Luquetti, Lea Tami Suzuki Zuchelo, Eduardo Carvalho de Arruda Veiga, Juliana Zangiroli Raimundo, Francisco Winter dos Santos Figueiredo, Mayara Souza Alves, Isabel Cristina Esposito Sorpreso, Edmund Chada Baracat

Disciplina de Ginecologia, Departamento de Obstetrícia e Ginecologia, Hospital das Clínicas, Faculdade de Medicina da Universidade de São Paulo, São Paulo, SP, Brazil
Laboratório de Epidemiologia e Estatística, Centro Universitário do ABC, Santo André, SP, Brazil

HIGHLIGHTS

- Adolescents’ knowledge of HPV.
- Adolescents’ knowledge of sexually transmitted diseases.
- Female adolescents’ knowledge of HPV and sexually transmitted diseases.
- Male adolescents’ knowledge of HPV and sexually transmitted diseases.

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ABSTRACT

Purpose: To assess the knowledge of students from public high schools in poor communities about HPV and Sexually Transmitted Infections and their attitude towards and prevention of such diseases.
Patients and methods: Cross-sectional study with adolescents from public schools of São Paulo – Brazil. Participants were selected for an interview by a randomization program. A questionnaire about knowledge, attitudes, and preventive practices regarding STIs, including HPV, according to sex was administered and answers were analyzed by the Poisson regression model with robust variance.
Results: Median age of the 269 participants was 16 years. The majority was of African descent (68.8%, n = 185), most (74%, n = 199) were religious and the vast majority (90.7%, n = 244) lived with their parents. The Poisson regression revealed statistically significant sex-related differences regarding the following questions: “Do you know how it is prevented?” (PR = 1.12 [1.03–1.23], p = 0.007); “Have you ever been concerned with HPV?” (PR = 1.10 [1.02–1.19], p = 0.011); “Have you ever sought health care due to concerns about HPV?” (PR = 1.09 [1.04–1.14], p < 0.001); “Do you know what a Pap Smear is?” (PR = 1.24 [1.13–1.36], p < 0.001); “Do you know what cervical cancer is?” (PR = 1.13 [1.04–1.22], p = 0.004).
Conclusions: The present results show that adolescents from public schools in poor communities in São Paulo City know little about HPV and cervical cancer. Male adolescents know less than female adolescents and are less concerned with health care.

Introduction

Adolescence is the period when sexual life might initiate. Currently, most adolescents engage in sexual intercourse at an increasingly early age. Lack of knowledge and early engagement in sex render adolescents vulnerable to Human Papillomavirus (HPV) and other Sexually Transmitted Infections (STIs).

The prevalence of HPV in Brazil is 40% to 60%, and in the state of São Paulo, it is over 56%. The quadrivalent HPV vaccine was introduced in Brazil at no cost to the population in 2014, reaching a vaccination coverage of 100% of the target population; however, after changes in the vaccination strategy, the coverage dropped to 44.64% in 2015. Distribution of male condoms and HPV vaccination are strategies to reduce transmission of HPV and other STIs and prevent precursor lesions.
of cervical cancer among teenagers. Adherence to condom use and to vaccination are behaviors dependent on one’s knowledge of these infections, and they may be influenced by sex, socioeconomic level, and educational, cultural, and religious backgrounds.1,2

A school is a place of learning for adolescents. It not only plays an important role in education, but it is also a setting for the promotion of reproductive and sexual health among youth.4,5

HPV infection is associated with age, for it is young people who are most prone to taking risks. In Brazil, the quadrivalent HPV vaccine is freely distributed to girls from 9 to 14 years old, boys from 11 to 14 years old, and immunosuppressed men and women, aged 9 to 45 years, living with HIV/AIDS, transplanted solid organs or bone marrow, and cancer patients.6,7

However, the authors don’t know if public high schools in underprivileged areas are being able to transmit necessary information about HPV and STIs and to develop the interest of adolescents from low-income families in their sexual health. Therefore, the study’s objective was to assess the knowledge of students from public high schools in poor communities in the city of São Paulo about HPV and STIs and their attitude towards such diseases, and the measures they take to prevent them.

Methods

Type of study, setting, and time span

This cross-sectional study assessing students from three public high schools was conducted by the Discipline of Gynecology of the Universidade de São Paulo (USP) between 2018 and 2019. The project was approved by the Ethics Committee of the “Faculdade de Medicina da Universidade de São Paulo” (FMUSP). The protocol number is 38719314.2.00000068.

Of the 2588 students from three state high schools located in the city of São Paulo, 375 were selected for an interview according to the following inclusion criteria: proper enrollment in a public school and 19 years of age or less. Fig. 1 shows the flowchart of student inclusion.

Sample size

The sample size was estimated at 253 students, given a confidence level of 85% and power test of 80% in line with the Kops et al. (2019) study, which evaluated adolescents’ level of HPV knowledge.

Randomization

The students were selected for an interview by a computer-generated randomization list. If a student on the list was unwilling to participate, no substitution was made (the refusal rate was 20%). Prior to data collection, all interviewers were trained and certified.

Data collection and instrument used

The questionnaire was designed by the authors in accordance with the scientific literature. It addresses the student’s knowledge of the prevention, transmission, and consequences of STIs, including HPV, as well as their attitude toward the diseases and their preventive practices. The questionnaire contains 13 items grouped into four categories: knowledge, attitudes, health practices, and HPV vaccination.

The questionnaires were administered by students from the Programa Institucional de Bolsas de Iniciação Científica (PIBIC) (Institutional Scientific Initiation Scholarship Program), which is a program of prescientific initiation and technology innovation at USP. Before the questionnaires were handed out, the participants were informed about the research objectives, and they signed an informed consent form. No student identification was required on the questionnaire. After the students completed the questionnaires, any questions they had were answered for further clarification.

A pilot study was conducted in 2018 (n = 50) to evaluate and improve the questions and ensure comprehension. Validation of the questionnaire was based on experts’ analyses (five researchers with substantial experience in field research and epidemiological studies), semantic analyses, and pretesting. After completion, each questionnaire was analyzed and then tabulated. Thirty pilot interviews were recorded, and three interviewers listened to each interview. The questionnaire was then improved further, and the interviewers received instructions for administering an interview and training as well as shown in Supplementary Material.

In addition to the questionnaire above, a sociodemographic questionnaire was drawn up with questions about birthplace, age, ethnicity, sex, religion, family income, the social welfare program (Bolsa Família), sexual intercourse, and family nucleus.

Questionnaire validation

The questionnaire was validated using a factor analysis of answers and questions, following the methods of factorial analysis. Intraobserver and interobserver reliability was tested using the κ method, and consistency was measured with Cronbach’s alpha coefficient.

Statistical analysis

The data were tabulated and analyzed by the Stata® 14.2 (Stata Corp, College Station, USA) software. Answers to questions 1, 2, 3, 6, 7, 8, 9, 10, 11, 12, and 13 were dichotomized into “presence of knowledge” when the answer was “I know a little” or “I know”, and “lack of knowledge”, when the answer was “I don’t know”, “I heard of” or “I know partially”.

On the other hand, answers to questions 4 and 5 were dichotomized into “I was worried/I sought health care”, “when the answer was “frequently”, “I’m aware”, or “I worried a lot”, and into ‘I wasn’t worried/I didn’t seek health care’ when the answer was “never” or “sometimes”.

The dataset is published in Harvard data verse: https://doi.org/10.7910/DVN/OCNLUF.

Participants were divided into 2 groups according to their sex: male or female. Qualitative variables were reported as absolute and relative frequencies, and the quantitative variable ‘age’ was expressed by the median and confidence interval. The Chi-Square and the Mann-Whitney tests were used to analyze homogeneity between the two groups in relation to socioeconomic variables.

The Poisson regression model with robust variance was used to analyze the answers to questions about students’ knowledge, attitudes, and preventive practices with respect to STIs, including HPV, according to
sex. The level of statistical significance for the sample was set at 5%. The model was adjusted according to income, age, ethnicity, grade repetition, cohabitation with parents, and religion.

Results

The internal consistency of the questionnaire, expressed by Cronbach’s alpha coefficient, 0.78 in this case, was substantial.

The total study population consisted of 269 high school students in which the median age was 16 years (95% CI 15.9–16.1; p = 0.310). The majority (74.7%, n = 201) lived in the city of São Paulo, and most of these (59.1%, n = 156) resided in neighborhoods near their schools. A considerable number of the students (68.8%, n = 185) were of African descent.

Over half of the adolescents (50.6%, n = 136) declared they had already engaged in sexual intercourse; most (74%, n = 199) had religious beliefs; a vast majority (90.7%, n = 244) lived with their parents; and over two-thirds (67.3%, n = 181) had never failed a grade in school. Despite the fact that most (60.6%, n = 163) received less than the minimum salary, a very large number (80.8%, n = 215) were not enrolled in the country’s social welfare program, the so-called Bolsa Família (Table 1).

The comparison of sociodemographic characteristics between the female and the male students yielded a significant statistical difference only in terms of the variable “has religious beliefs” (p = 0.037).

A sex-based analysis of the student’s responses to questions about their knowledge, attitudes, and preventive practices with respect to HPV and STIs, along with the 95% CI, prevalence ratio, and p results, is shown in Table 2.

The use of the adjusted Poisson regression model with robust variance revealed a difference in the answers of boys and girls. The following questions had statistically different answers when comparing the female and the male adolescents: “Do you know what HPV is?” (PR = 1.26 [1.16–1.37], p < 0.001); “Do you know how it is prevented?” (PR = 1.12 [1.03–1.23], p = 0.007); “Have you ever been concerned with HPV?” (PR = 1.10 [1.02–1.19], p = 0.011); “Have you ever sought health care due to concerns about HPV?” (PR = 1.09 [1.04–1.14], p < 0.001); “Do you know what a Pap Smear is?” (PR = 1.24 [1.13–1.36], p < 0.001); “Do you know what the cervix is?” (PR = 1.23 [1.13–1.34], p < 0.001); “Do you know what cervical cancer is?” (PR = 1.13 [1.04–1.22], p = 0.004). A statistical difference was also found in the crude model, which also exhibited a difference in relation to the question “Do you know how it is transmitted?” (PR = 1.10 [1.01–1.19], p = 0.032) (Table 2).

Discussion

In adolescence, the desire for sexual experience frequently predisposes young people to risky sexual habits due to their immaturity and inexperience. Access to information and health professionals can assist with guidance and the acquisition of healthy habits.

The present study indicates that adolescents know little about STIs, that less than 40% show some concern about HPV, and that only 12.6% have sought health care due to worries about HPV. The male sex was less knowledgeable and concerned than the female sex.

Studies of knowledge about HPV/STI are important guidelines in public health, as they show that gaps in understanding can be barriers to the self-care process and to adherence to vaccination programs. The consequences of HPV are not immediate since cancer precursor lesions and HPV-induced lesions take a while to be detected and treated, with repercussions that include high mortality from these cancers, mainly in developing countries.

The sample was characterized by a majority population of Afro-descendants. This epidemiological profile is similar to that of other studies with parallel topics. The predominance of students of African descent in public schools should be highlighted. Racial inequality among low-income adolescents in Brazil is a factor that may have a negative psychological influence, especially when one feels discriminated against by

| Table 1 | Socioeconomic variables of public high school students according to sex. |
|---------|-------------------------------------------------------------------------|
| Characteristics | Female n (%) | Male n (%) | Total n (%) | p² |
| City | | | | |
| In São Paulo | 91 (74.6) | 110 (74.8) | 201 (74.7) | 0.964 |
| Out of São Paulo | 31 (25.4) | 37 (25.2) | 68 (25.3) | |
| Neighborhood | | | | |
| Near school | 72 (61.0) | 84 (57.5) | 156 (59.1) | 0.567 |
| Far from school | 46 (39.0) | 62 (42.5) | 108 (40.9) | |
| Ethnicity | | | | |
| White | 38 (31.1) | 46 (31.3) | 84 (31.2) | 0.980 |
| Non-white | 84 (68.9) | 103 (68.7) | 185 (68.8) | |
| Has religious beliefs | | | | |
| Yes | 98 (80.3) | 101 (68.7) | 199 (74.0) | 0.031 |
| No | 24 (19.7) | 46 (31.3) | 70 (26.0) | |
| Has had sexual intercourse | | | | |
| Yes | 59 (48.4) | 77 (52.4) | 136 (50.6) | 0.511 |
| No | 63 (51.6) | 70 (47.6) | 133 (49.4) | |
| Lives with parents | | | | |
| Yes | 110 (90.2) | 134 (91.2) | 244 (90.7) | 0.780 |
| No | 12 (9.8) | 13 (8.8) | 25 (9.3) | |
| Has repeated a grade | | | | |
| Yes | 33 (27.0) | 55 (37.4) | 88 (32.7) | 0.071 |
| No | 89 (73.0) | 92 (62.6) | 181 (67.3) | |
| Receives Bolsa Família | | | | |
| Yes | 19 (15.7) | 32 (22.1) | 51 (19.2) | 0.189 |
| No | 102 (84.3) | 113 (77.9) | 215 (80.8) | |
| Income | | | | |
| < 1 minimum salary | 72 (60.0) | 91 (62.8) | 163 (61.5) | 0.646 |
| > 1 minimum salary | 48 (40.0) | 54 (37.2) | 102 (38.5) | |
| Age | | | | |
| Median (95% CI) | 16 (16–16) | 16 (16–16) | 16 (16–16) | 0.310 |

¹ Chi-square test;
² Mann-Whitney test, n, number of cases; CI, Confidence Interval.
their ethnicity. Moreover, the lack of public policies for the dissemination of accessible knowledge among the less favored social class could explain the low level of knowledge of students about their health. This way, greater investments in education and health in this age group, along with religion, may increase interest in sexual health in developing countries such as Brazil.

The assessment of homogeneity between characteristics of male and female adolescents shows that the variable ‘has religious beliefs’ is answered positively more often by the female population. The studied disease. This may be associated with the discrepancy between the sexes. The study by Genz et al. (2017) reported that girls talked more about sex with their mothers than boys. This factor may have predisposed female adolescents to seek more information regarding STIs (and, consequently, HPV), thus deepening their understanding of the virus and of ways to prevent the disease.

Besides, in Brazil, the implementation of the government’s HPV vaccine program in schools, initially was limited to girls and their parents, which may have contributed to the differences in knowledge between the sexes. In the study by Sousa et al. (2018), students, particularly those in the 10 to 14 age group, displayed scant knowledge of the HPV vaccine. This population deserves attention as it is going through a period of physical changes, emotional instability, and exposure to new experiences, which makes them more vulnerable and thus subject to contracting HPV and other STIs through risky behavior or unprotected sex. As genital warts, penile intraepithelial neoplasia, and even penile carcinomas.  

Table 2 Knowledge, attitudes, and preventive practices of public high school students with regard to HPV and other STIs according to sex.

| Characteristics                              | Female | Male  | Total | PR (95% CI)  | p  | PR (95% CI)  | p  |
|----------------------------------------------|--------|-------|-------|--------------|----|--------------|----|
| Do you know what HPV is?                     |        |       |       |              |    |              |    |
| Yes                                          | 89 (73.0) | 53 (36.1) | 142 (52.8) | 1.29 (1.19–1.40) | <0.001 | 1.26 (1.16–1.37) | <0.001 |
| No                                           | 33 (27.0) | 94 (63.9) | 127 (47.2)  |              |    |              |    |
| Do you know how it is transmitted?           |        |       |       |              |    |              |    |
| Yes                                          | 85 (69.7) | 84 (57.1) | 169 (62.8)  | 1.10 (1.01–1.19) | 0.032 | 1.09 (1.00–1.19) | 0.054 |
| No                                           | 37 (30.3) | 63 (42.9) | 100 (37.2)  |              |    |              |    |
| Do you know how it is prevented?             |        |       |       |              |    |              |    |
| Yes                                          | 93 (76.2) | 88 (59.9) | 181 (67.3)  | 1.13 (1.04–1.23) | 0.003 | 1.12 (1.03–1.23) | 0.007 |
| No                                           | 29 (23.8) | 59 (40.1) | 88 (32.7)   |              |    |              |    |
| Have you ever been concerned with HPV?       |        |       |       |              |    |              |    |
| Yes                                          | 59 (48.4) | 47 (32.0) | 106 (39.4)  | 1.11 (1.03–1.19) | 0.006 | 1.10 (1.02–1.19) | 0.011 |
| No                                           | 63 (51.6) | 100 (68.0) | 163 (60.6)  |              |    |              |    |
| Have you ever sought health care due to concerns about HPV? |        |       |       |              |    |              |    |
| Yes                                          | 26 (21.3) | 8 (5.4) | 34 (12.6)  | 1.09 (1.04–1.14) | <0.001 | 1.09 (1.04–1.14) | <0.001 |
| No                                           | 96 (78.7) | 139 (94.6) | 235 (87.4)  |              |    |              |    |
| Do you know what Pap Smear is?               |        |       |       |              |    |              |    |
| Yes                                          | 79 (64.8) | 43 (32.9) | 122 (45.4)  | 1.23 (1.12–1.34) | <0.001 | 1.24 (1.13–1.36) | <0.001 |
| No                                           | 43 (35.2) | 104 (70.7) | 147 (54.6)  |              |    |              |    |
| Do you know what the cervix is?              |        |       |       |              |    |              |    |
| Yes                                          | 92 (75.4) | 65 (44.2) | 157 (58.4)  | 1.25 (1.15–1.35) | <0.001 | 1.23 (1.13–1.34) | <0.001 |
| No                                           | 30 (24.6) | 82 (55.8) | 112 (41.6)  |              |    |              |    |
| Do you know what cancer is?                  |        |       |       |              |    |              |    |
| Yes                                          | 119 (97.5) | 138 (93.9) | 257 (95.5)  | 1.04 (1.00–1.08) | 0.129 | 1.03 (0.98–1.08) | 0.227 |
| No                                           | 3 (2.5) | 9 (6.1) | 12 (4.5)   |              |    |              |    |
| Do you know what cervical cancer is?         |        |       |       |              |    |              |    |
| Yes                                          | 72 (59.0) | 59 (40.1) | 131 (48.7)  | 1.13 (1.05–1.23) | 0.002 | 1.13 (1.04–1.22) | 0.004 |
| No                                           | 50 (41.0) | 88 (59.9) | 138 (51.3)  |              |    |              |    |
| Do you know what STI is?                     |        |       |       |              |    |              |    |
| Yes                                          | 110 (90.2) | 126 (85.7) | 236 (87.7)  | 1.04 (0.97–1.12) | 0.260 | 1.03 (0.96–1.11) | 0.337 |
| No                                           | 12 (9.8) | 21 (14.3) | 33 (12.3)   |              |    |              |    |
| Do you know how to prevent it?               |        |       |       |              |    |              |    |
| Yes                                          | 110 (90.2) | 122 (83.0) | 232 (86.2)  | 1.07 (0.99–1.14) | 0.080 | 1.05 (0.98–1.13) | 0.151 |
| No                                           | 12 (9.8) | 25 (17.0) | 37 (13.8)   |              |    |              |    |
| Do you know what a condom is?                |        |       |       |              |    |              |    |
| Yes                                          | 112 (91.8) | 135 (91.8) | 247 (91.8)  | 1.00 (0.94–1.06) | 0.992 | 1.00 (0.94–1.07) | 0.951 |
| No                                           | 10 (8.2) | 12 (8.2) | 22 (8.2)    |              |    |              |    |
| Do you know someone who has had a sexually transmitted disease? |        |       |       |              |    |              |    |
| Yes                                          | 25 (20.5) | 25 (17.0) | 50 (18.6)   | 1.02 (0.97–1.07) | 0.469 | 1.01 (0.96–1.07) | 0.733 |
| No                                           | 97 (79.5) | 122 (83.0) | 219 (81.4)  |              |    |              |    |

a Crude model; 

b Adjusted Model by income, age, ethnicity, grade retention, cohabitation with parents, and religion. PR, Prevalence ratio; CI, Confidence Interval.
Thus, there is a need to intensify campaigns, which should aim mostly at public school male teenagers. Not only chemical and biological processes, but also intense and unstructured emotions may occur in this phase, possibly triggering affective relationships that become the gateway to erroneous, premature, and unprotected sex predisposing adolescents to contract STIs.17

One of the limitations of this cross-sectional study is that the present study’s sample consisted of adolescents from public schools. This narrow selection of subjects may have biased the variable ‘knowledge and perception’ because it does not necessarily express the reality of other teenagers with the same socioeconomic level or access to education.

Another limiting factor is the use of quantitatively analyzed objective questionnaires, where students were asked whether or not they had knowledge about the subjects in question, but these answers were not confirmed. In this way, the knowledge investigated is referred/received. In addition, the questionnaires do not allow the exploration of socioeconomic aspects, such as religious beliefs, nor the prevalence of STI/HPV and vaccination. Another shortcoming is the fact that this study was not designed to assess the real causes of male disinterest in their health. Therefore, other studies are needed.

The highlights of this study conducted in a poor community include an elucidation of the divergences of sexual health knowledge among adolescents and a comparison of boys’ and girls’ knowledge. Such information can be used to underpin sex education, reproductive health programs, and specific health promotion actions. Public health education should be the focus of pediatric and adolescent gynecologists.

Conclusion

The present results show that about half of the adolescents from public schools in the city of São Paulo do not know what HPV is, nor do they know what cervical cancer is. Indeed, a large part never worried about HPV and the vast majority did not seek a health service due to HPV-related issues. In addition, male adolescents not only know less than female adolescents but are also less concerned about health care.

Ethics approval

The project was approved by the Ethics Committee of the Faculdade de Medicina da USP. The protocol number is SPS/1314.2.0000068.

Consent to participate

The participants were informed about the research objectives, and they signed an informed consent form.

Authors’ contributions

J.M.S.J.: He made substantial contributions to the concept, study design, and definition of intellectual content; he was involved in literature search, data analysis, statistical analysis, manuscript preparation, and manuscript writing; he drafted the article or revised it critically for important intellectual content, and he approved the final version to be published.

H.M.C.O.: She made substantial contributions to the concept, study design, and definition of intellectual content; she was involved in literature search, data analysis, statistical analysis, manuscript preparation, and manuscript writing; she drafted the article or revised it critically for important intellectual content; and she approved the final version to be published.

C.M.L.: She was involved in literature search, data analysis, statistical analysis, manuscript preparation, and manuscript writing; she drafted the article or revised it critically for important intellectual content.

L.T.S.Z.: She was involved in literature search, data analysis, and statistical analysis; and she approved the final version to be published.

E.C.A.V: He was involved in literature search, data analysis, and statistical analysis; and he approved the final version to be published.

J.Z.R.: She was involved in literature search, data analysis, statistical analysis; and she approved the final version to be published.

F.W.S.F.: He was involved in literature search, data analysis, and statistical analysis; and he approved the final version to be published.

M.S.A.: She was involved in literature search, manuscript preparation, and manuscript writing; and she approved the final version to be published.

I.C.E.S.: She made substantial contributions to the concept, study design, and definition of intellectual content; she was involved in literature search, data analysis, statistical analysis, manuscript preparation, and manuscript writing; she drafted the article or revised it critically for important intellectual content; and she approved the final version to be published.

E.C.B: He was involved in literature search, data analysis, and statistical analysis; and he approved the final version to be published.

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Conflicts of interest

The authors declare no conflicts of interest.

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Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.clinsp.2022.100138.

References

1. Britas JRS, Silva OCV, Pereira JD, Muroya RL. Conhecimentos de adolescentes sobre Doenças Sexualmente Transmissíveis: subsídios para prevenção. Acta Paul Enferm 2009;22(6):786–92.
2. World Health Organization. The sexual and reproductive health of young adolescents in developing countries: reviewing the evidence, identifying research gaps, and moving the agenda: report of a WHO technical consultation. Geneva: World Health Organization; 2011. 4-5 November 2010 https://apps.who.int/iris/handle/10665/70569

3. Brasil. Estratégia de vacinação contra HPV: vacinômetro. 2014/2015. Ministério da Saúde. Sistema de Informação ao Programa Nacional de Imunizações. 2015 Available from http://sni.datasus.gov.br/consulta_hpv_14_selecao.php.
4. Brasil. Ministério da Saúde: Proteger e cuidar da Saúde de Adolescentes na Atenção Básica. Brasília, DF: 2017. Available in: https://bvsms.saude.gov.br/bvs/publicacoes/proteger_cuidar_adolescentes_atencao_basica.pdf Access in: 10 Jan. 2020.
5. Dubé E, Gagnon D, Ouakki M, Bettinger JA, Witteman HO, MacDonald S, et al. Measuring vaccine acceptance among Canadian parents: A survey of the Canadian Immunization Research Network. Vaccine 2018;36(4):545–52.
6. Kops NL, Horvath JDC, Bessel M, Souza FMA, Benzaque AS, Pereira GFM, et al. The impact of socioeconomic status on HPV infection among young Brazilians in a nationwide multicenter study. Prev Med Rep 2021;21:101301.
7. Tartaglia E, Falcasoc K, Vecchiet J, Sabuno GP, Picciano G, Di Marco R, et al. Prevalence of HPV infection among HIV-positive and HIV-negative women in central/eastern Italy: strategies of prevention. Oncol Lett 2017;14(6):7629–35.
8. Kops NL, Hohenberger GF, Bessel M, et al. Knowledge about HPV and vaccination among young adult men and women: results of a national survey. Papillomavirus Res 2019;7:123–8.
9. Zucchi LST, 2021, “Adolescents’ knowledge of HPV and sexually transmitted infections at public high schools in São Paulo: a cross-sectional study”, https://doi.org/10.7910/DVN/OCNL3U. Harvard Dataverse, V1, UNF:6 commercials\DLR8@jH61oiy\

10. Britas JRS, Ohara CVS, Jardim DP, Aguilar Junior W, Oliveira JR. Aspectos da sexualidade na adolescência. Ciênc Saúde Coletiva 2011;16(7):3221–8.
11. Gomes JM, Silva BM, Santos EFdS, Kelly PJ, Costa AdS, Takitu AD, et al. Human Papillomavirus (HPV) and the quadrivalent HPV vaccine among Brazilian adolescents and parents: Factors associated with and divergences in knowledge and acceptance. PLoS ONE 2020;15(11):e0241674.

12. de Oliveira MSF, Sorpreso ICE, Zuchelo LTS, Silva ATM, Gomes JM, Silva BKR, et al. Knowledge and acceptability of HPV vaccine among HPV-vaccinated and unvaccinated adolescents at Western Amazon. Rev Assoc Med Bras 2020;66(8):1062–9.

13. Santana V, Almeida-Filho N, Roberts R, et al. Skin colour, perception of racism and depression among adolescents in urban Brazil. Child Adolesc Ment Health 2007;12(3):125–31.

14. Chandra-Mouli V, Ferguson BJ, Plesons M, Cooper SP. The political, research, programmatic, and social responses to adolescent sexual and reproductive health and rights in the 25 years since the international conference on population and development. J Adolesc Health 2019;65(6S):S16–40.

15. Coutinho RZ, Miranda-Ribeiro P. Religiao, religiosidade e iniciacao sexual na adolescencia e juventude: liacoes de uma revisao bibliografica sistematica de mais de meio século de pesquisas. Rev Bras Estud Popul 2014;31(2):333–65.

16. Dareng EO, Jedy-Agba E, Bamisaye P, Modibbo FI, Oyeneyin LO, Adewole AS, et al. Influence of spirituality and modesty on acceptance of self-sampling for cervical cancer screening. PLoSOne 2015;10(11):e0141679.

17. Genz N, Meincke SMK, Caret MLV, Correa ACL, Alves CN. Doencas Sexualmente Transmissiveis: conhecimento e comportamento sexual de adolescentes. Enferm 2017;26(2):e5100015.

18. Pinheiro RS, Viacava F, Travassos C, Brito AS. Genero, morbidade, acesso e utilizacao de serviços de saude no Brasil. Cienc Saude Coletiva 2002;7(4):687–707.

19. Mauro AB, Fernandes EG, Miyaji KT, Arantes BA, Valente MG, Sato HK, et al. Adverse events following Quadrivalent HPV vaccination reported in Sao Paulo State, Brazil, in the first three years after introducing the vaccine for routine immunization (March 2014 to December 2016). Rev Inst Med Trop Sao Paulo 2019;61:e43.

20. Sousa PDL, Takitu AD, Baracat EC, Sorpreso ICE, Abreu LC. Knowledge and acceptance of HPV vaccine among adolescents, parents and health professional: construct development for collection and data base composition. J Hum Growth Dev 2018;28(1):58–68.

21. Silva ATM, Souza GD, Lohmann CM, Ferreira Filho ES, Pinheiro WS, Soares Junior JM, et al. Vulnerability in adolescence: a case report of attempted abortion and sexual violence. J Hum Growth Dev 2017;27(1):117.

22. Palencia-Sanchez F, Echeverry-Coral SJ. Social considerations affecting acceptance of HPV vaccination in Colombia. A systematic review. Rev Colomb Obstet Ginecol 2020;71(2):178–94.

23. Abdalla GK, Fajardo EF, Gomes BB, Bianco TM, Salge AKM, Carvalho EEV, et al. Analysis of knowledge level in Brazilian students about human papillomavirus infection and development of penile cancer. Asian Pac J Cancer Prev 2017;18(5):1371–6.

24. Prayudi PKA, Permatasari AAJ, Winata IGS, Suwiyoga K. Impact of human papilloma virus vaccination on adolescent knowledge, perception of sexual risk and need for safer sexual behaviors in Bali, Indonesia. J Obstet Gynaecol Res 2016;42(12):1829–38.

25. Rozendaal L, Walboomers JM, van der Linden JC, Voorhorst FJ, Kenemans P, Helmerhorst TJ, et al. PCR-based high-risk HPV test in cervical cancer screening gives objective risk assessment of women with cytomorphologically normal cervical smears. Int J Cancer 1996;68(6):766–9.

26. Stratton KL, Culkin DJ. A contemporary review of hpv and penile cancer. Oncology (Williston Park) 2016;30(3):245–9.