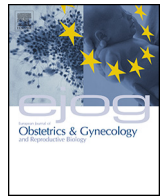




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Full length article

## Human papillomavirus knowledge, beliefs, and behaviors: A questionnaire adaptation



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### ABSTRACT

**Objective:** This study aims to adapt a questionnaire about the knowledge, beliefs and behaviors regarding HPV and related subjects into Brazilian Portuguese.

**Study Design:** National Survey.

**Methods:** The instrument was translated into Portuguese and retranslated into English separately. Experts assessed the validity of the content and cross-cultural adaptation of the instrument. The instrument was administered to 8580 male and female Brazilian adolescents and young adults (aged between 16 and 25 years) who participated in the National Survey of Human Papillomavirus Prevalence (POP-Brazil). This large-scale survey enrolled participants from 26 Brazilian capitals and the Federal District.

**Results:** The full questionnaire is composed of 30 questions, with a good absolute agreement between its two halves ( $61.16 \pm 9.97$ ). The preventive behavior section showed the lowest agreement. Men and women showed a difference concerning their knowledge about HPV (score for men  $0.48 (\pm 8.93)$  vs. women  $0.55 (\pm 4.51)$ ,  $p < 0.001$ ).

**Conclusion:** The proposed questionnaire is the first instrument able to describe the knowledge, beliefs and behaviors regarding HPV and related subjects in Brazilian women and men. This questionnaire appears to be adequate for use in future studies that may produce evidence and knowledge on these specific topics.

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### Background

The vaccine against human papillomavirus (HPV) is an effective and safe method to prevent HPV infections and consequent HPV-related cancers [1–3]. Persistent infection with high-risk HPV types is the primary cause of cervical cancer, one of the most common cancer in women around the world [4]. Furthermore, high-risk HPV infections are also linked with anogenital (vulvar, vaginal, penile and anal) and head and neck cancers [4–7]. HPV infections are the most common sexually transmitted disease in the United States, with approximately 14 million new genital infections related to HPV each year [8]. There is no nationwide data on HPV prevalence in Brazil, but some regional data and a systematic review shows a prevalence varying from 10.4 to 24.5 in women [9] and around 60% in men [10].

Clinical trial results show that the vaccine against HPV is safe and very effective at preventing infections, in the first years vaccine introduction, more than 40 countries have implemented national vaccination programs against HPV [11]. Nowadays, although vaccination is implemented in more than 80 countries [12], many places continue to report relatively low coverage [3,13–15] and was not yet implemented in many lower income countries, who have populations with the higher cervical cancer incidence rates [12]. Brazil began providing a quadrivalent HPV vaccine (HPV types 6, 11, 16 and 18) at schools in 2014 through the National Public Health System, with coverage near 93% in 2014; however, there was a marked decline in coverage in the following year (only 41.1% for the first dose) [16,17].

Stokley et al showed that the most common cause of no vaccination among female adolescents in the United States of America was a lack of knowledge about the HPV vaccine [18]. This lack of information can also be seen with parents and guardians and is negatively associated with compliance with vaccination. The lack of recommendation and lack of HPV awareness and knowledge is recognized the different stakeholders as parents,

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leaders involved in HPV vaccination policies and practices and even so the adolescents as the main causes of HPV vaccine refusals [19–21]. Adolescents also reported concerns related to the cost, potential side effects, vaccination age, perceived needs and fear of injections [22,23]. Therefore, describing adolescents' attitudes and knowledge about the risks associated with HPV infection and acquisition should be a priority, since sexual activity is an important determinant of sexual infections [17], especially during the transition to adulthood.

For this reason, developing an instrument that accurately measures the young person's knowledge about HPV is fundamental to better understand behavior and to provide information to develop effective prevention programs and campaigns to encourage HPV vaccination. Thus, the objective of this study is to adapt a questionnaire that evaluates the knowledge, beliefs and behaviors regarding HPV, HPV vaccinations and Pap tests of Brazilian adolescents and young adults.

## Material and methods

We conducted a multicenter, national survey of Brazilian sexually active adolescents and young adults, aged 16–25 years, who used the public health system in 26 Brazilian capitals and the Federal District. The data were collected by trained health professionals, in primary care units, between 2016–2017. Briefly, the participants were recruited using different approaches such as list of patients, clinic visits, domiciliary visits, and school-based educational health programs. The sampling was distributed equally in all Brazilian regions to allow a greater variability and were weighted during analysis. More details about the study protocol were previously published [24].

### Original questionnaire description

The original questionnaire [25] was developed to Italian population and included 24 items in three sections: 1) knowledge about HPV, diseases related to HPV infections and vaccination; 2) Pap tests and the gynecologist-patient relationship; and 3) sociodemographic data. The Cronbach's alpha value of this instrument was 0.774.

### Cross-cultural adaptation

For cross-cultural adaptation, two bilingual recognized doctors with expertise in this subject initially translated the instrument into Portuguese. A bilingual professional, blind to the original version, performed a back-translation to English, independently. To reach the final version, the expert team assessed the content validity.

We performed a pretest and a pilot. The pretest was conducted with a small group of students ( $n = 30$ ) and provided data about the grammar and difficulty of the questions; this process helped identify problematic items and the understanding of questions. The pilot evaluation ( $n = 200$ ) provided information about vocabulary and allowed the cross-cultural adaptation for all regions of Brazil (southern, southeastern, central-west, northeastern, and northern). Primary health care professionals of all regions also give feedback about the content and vocabulary.

### Content adaptation

We evaluated the operational equivalence, the format of the questions and the application form. Recognized doctors with expertise in this subject conducted this step. We also analyzed the clarity of the language, practical relevance and theoretical relevance; in addition, we included questions considered relevant

to a Brazilian population. Finally, we analyzed the whole questionnaire using a methodology similar to previous questionnaire-adaptation studies [26,27].

### Statistical analysis

Data entered into an online database were analyzed using SAS software (Statistical Analysis System, SAS Institute Inc., Cary, N.C.), version 9.4, and statistical significance was defined as  $p < 0.05$ . We adjusted the sample size of the study by the distribution of the population size in each capital and by sexual gender.

Descriptive analyses were performed using percentages and frequencies, and we created a score (range 0–14 for men and 0–16 for women) that recategorized the variables as dichotomic measures (adequate and not adequate answers). The difference between men's and women's scores was because men did not answer questions related to Pap smears. In this scoring system, questions about sexual behaviors, attitudes or beliefs, and socio-demographic factors were not included, creating a total of 16 questions.

To evaluate the construct validity, instead of analyze differences in two relevant groups [28], we split the total sample in two random halves [29], assuming that the standard deviations between two halves were equal and highly correlated [30]. The median age between two halves was equal ( $p = 0.8423$ , independent t-test), and we used this variable to assure the groups were comparable. To analyze the absolute agreement by gender, we first categorized the sample by gender and then split the full sample randomly in two halves. The interpretation of the magnitude of the concordance estimators is normally agreed to be as follows: 0 (absence), 0–19% (poor), 20–39% (weak), 30–59% (moderate), 60–79% (substantial/good), and  $\geq 80\%$  (strong) [31,32].

The study protocols were approved by the Research Ethics Committee of the Hospital Moinhos de Vento of Porto Alegre and followed the standards of Resolution 466/12 of the National Council for research involving humans. All individuals were informed about the research objectives and confidentiality of the data and provided written consent.

## Results

### Content adaptation

The full version of the questionnaire consists of four sections. The first section includes items about HPV, the second is composed of questions about sexual behavior, the third is composed of questions about Pap tests and was exclusively used for women, and the last is a social demographic profile; the comparative among original questionnaire and the POP-Brazil questionnaire is at Appendix 1. An important goal in designing a questionnaire is maintaining the respondent's compliance and interest [33]. Therefore, highly relevant questions were placed at the beginning of the questionnaire, and embarrassing or sensitive questions were placed at the end (Appendix 1).

In content adaptation, we had removed six questions. The question "Who should provide the vaccine against HPV?", because at Brazil the vaccine was already provided by the Brazilian Public Health System. The question "How often do you have sexual intercourse?" was replaced by "How many people did you have sex with in the last 12 months?". The question "During pap test, are you satisfied with the communicative aspects with your gynecologist?" was excluded because at Brazil, general physician or nurse can also do the test. Some socio-demographics factors, as Father's and mother's profession and religion were replaced for questions usually used in Brazilian questionnaires to evaluate income and social class [34].

We included some questions regarding behavior associated with HPV vaccination and attitudes as: “Do you believe that a person infected with HPV necessarily presents with signs and symptoms?”, “Have you had the HPV vaccine?”, “You have not had the HPV vaccine because . . . .:”, “When you have sexual relations, do you and your partner use any contraceptive method?”, and “Have you ever had any changes in Pap smear results?”.

#### Score analyses and absolute agreement

We assessed data from all participants who were able to finish the interview (98.15%), a total of 8580 participants. Sociodemographic results are shown in Table 1.

To analyze the knowledge, we used the score previously reported. Men and women showed several differences in their knowledge about HPV. Women were more often correct about the relation between HPV and cervical cancer but at same time were more often wrong about the relation between HPV and cystitis. Men showed more adequate preventive behavior, such as using condoms, than women (Table 2). In general, neither men nor women knew about the relation between HPV and esophageal cancer.

More than half of the participants answered at least 50% of questions correctly, and only 77 participants did not provide any correct answers (Fig. 1). Although men showed more adequate answers in some sections, in general, women presented better scores (men 0.48 ( $\pm$  8.93) vs. women 0.55 ( $\pm$  4.51),  $p < 0.001$ ).

The mean absolute agreement between the split data from the Pop-Brazil V6 was 61.16 ( $\pm$  9.97). The question “In case you are vaccinated for HPV, what would be your attitude towards the Pap test” showed the highest absolute agreement at 87.37% (Table 3). The preventive behavior section showed the lowest agreement values.

#### Discussion

This study is the first to assess the knowledge, beliefs and behaviors regarding HPV throughout Brazil, and the first aimed at

**Table 1**  
Sociodemographic characteristics of participants.

Variables	Sample (n = 8.580)
Sex	n
Female	6.377
Male	2.203
Race/Skin color <sup>1</sup>	n (%)
White	2.086 (23.76)
Black	1.359 (16.83)
Pardo	4.881 (56.42)
Others	252 (2.99)
Family income	(%)
<500 dollars	41.16
500 ty 750 dollars	40.33
> 750 dollars	18.50
Education level	n (%)
Primary (some or complete)	1.815 (24.56)
Secondary (some or complete)	4.783 (57.43)
University level or higher	1.726 (18.01)
Age	n (%)
16–17 years	1.086 (14.14)
18–19 years	1.906 (20.92)
20–21 years	1.895 (21.52)
22–23 years	1.823 (21.60)
24–25 years	1.870 (21.82)

The table shows the results of sociodemographic characteristic. <sup>1</sup>Self-defined.

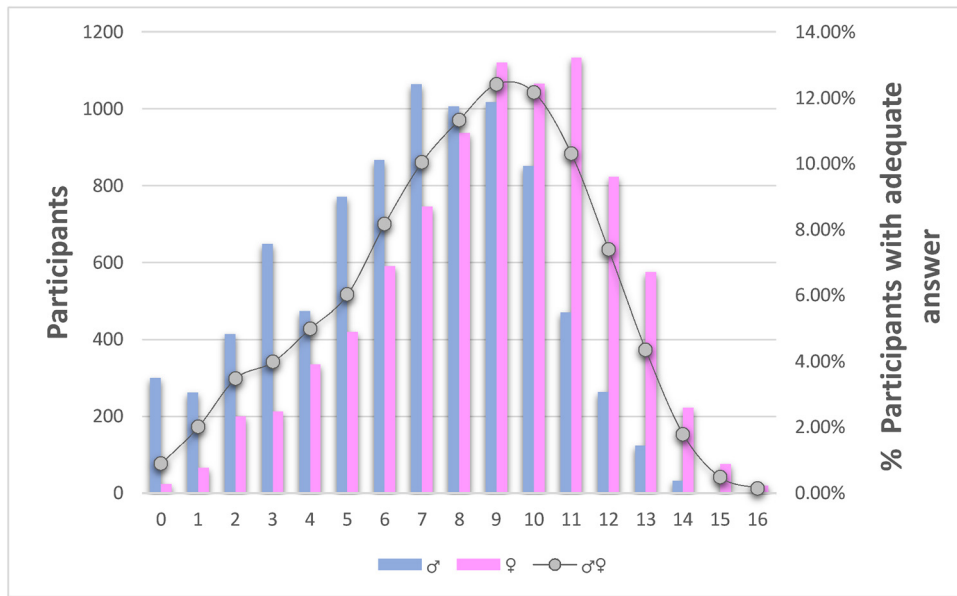
ensuring that a questionnaire about HPV adapted for our population has the same properties and functions as the original questionnaire. We used a large sample size, including young men and women of all Brazilian capitals, making the results valid for both sexes.

We consider values of agreement relevant because the magnitude of the acceptable difference between scores is not solely a statistical decision but also a clinical one, meaning that the acceptable difference depends on the purpose of the test. This questionnaire intended to describe concepts about sexual diseases. These ideas are difficult to measure because they depend on a person's attitudes and current beliefs about sex and these beliefs

**Table 2**  
Adequate answers by gender - POP-Brazil V6 score.

Questions	Correct	% Men	% Women	X <sup>2</sup>	
<b>HPV infection and presence some symptom</b>	Not presents symptom, necessarily	57.20	58.44	0.5288	
Which of the following diseases do you believe are related to HPV?	<b>Esophageal cancer</b>	YES	19.40	17.42	0.1846
	<b>Cervical cancer</b>	YES	62.30	<b>78.80</b>	<0.001*
	<b>Cystitis</b>	NO	<b>73.57</b>	67.71	0.0015*
	<b>Genital warts</b>	YES	64.89	64.60	0.8819
	<b>Bladder cancer</b>	NO	63.83	58.34	0.0059
	<b>Irritable bowel syndrome</b>	NO	55.26	49.89	0.0076
	<b>Anus cancer</b>	YES	49.03	48.72	0.8765
	<b>Mouth cancer</b>	YES	54.27	55.97	0.3937
Vaccine and HPV	<b>Have you known about HPV vaccination?</b>	YES	68.56	<b>83.06</b>	<0.001*
	<b>When do you believe the HPV vaccine should be had?</b>	Before first intercourse	63.08	66.93	0.0773
	<b>Who should be vaccinated?</b>	Boys and Girls <sup>1</sup>	<b>89.00</b>	82.57	<0.001*
Preventive Behavior	<b>When you have sexual relations, do you use a condom?</b>	YES	<b>54.24</b>	49.32	0.0106
	<b>Did you or your partner use a condom in the last intercourse?</b>	YES	<b>44.73</b>	37.42	0.0002*
Pap Test and HPV	<b>Do you know Papanicolaou test?</b>	YES	-	83.08	-
	<b>After Vaccine what would be the attitude towards the Pap smear?</b>	Would continue to take the exam	-	<b>94.52</b>	-

The table shows the questions include in the score (range 0–14 for men and 0–16 for women). The variables were recategorized like a dichotomic measure (adequate and not adequate answers). The perceptual in each question corresponds to the percentage of correct answers according to score, range (0–100%) for men and for women. <sup>1</sup>The recommendation gender for the vaccine in Brazil has changed during the study. The vaccine initially was just for girls, changing for girls and boys later.



**Fig. 1.** Participants who answered the Pop-Brazil V6 correctly. The figure shows the number of participants who answered correctly the questions in Pop-Brazil V6 following the score. The variables were recategorized like a dichotomic measure. The horizontal axis corresponds to the number of correct answers according score (range 0–14 for men ♂ and 0–16 for women ♀). The vertical left axis corresponds to number of participants; the vertical right axis corresponds to perceptual of participants with adequate answers, the columns are plotted in right axis.

can easily change in different contexts. Still, we must consider that talking about sex with teenagers and young adults is taboo [35,36], which could impact the results.

The preventive behavior section presented the lowest agreement, and this result was expected since the absolute agreement was determined based on independent participants, and this section comprises questions that have subjective and personal values. The question with the highest agreement was also the question with the lowest number of correct answers. The participants did not recognize the association between esophageal

cancer and HPV, reflecting a lack of knowledge about this specific topic. When we assessed differences in knowledge between genders, women showed more correct answers than men; this is likely because women are the primary focus of HPV vaccination efforts [37,38] and because cervical cancer is strongly correlated with HPV and the first cancer to be associated with HPV infections [39]. Although more women than men knew about the HPV vaccine, women indicated fewer preventive behaviors, reporting less condom use compared to other populations [40]. Knowledge about HPV does not appear to be associated with condom use in

**Table 3**  
Absolute agreement between two halves from the Pop-Brazil V6.

Questions	Absolute Agreement (%)	Absolute Agreement Men (%)	Absolute Agreement women (%)
<b>HPV infection and presence some symptom</b>			
Which of the following diseases do you believe are related to HPV?	54.76	56.01	53.32
<b>Esophageal cancer</b>	<b>71.52</b>	<b>71.48</b>	<b>71.08</b>
<b>Cervical cancer</b>	63.77	57.22	64.13
<b>Cystitis</b>	60.26	63.19	60.56
<b>Genital warts</b>	55.67	54.71	56.01
<b>Bladder cancer</b>	55.01	56.85	55.45
<b>Irritable bowel syndrome</b>	52.43	53.31	55.85
<b>Anus cancer</b>	<b>52.25</b>	<b>52.94</b>	<b>51.32</b>
<b>Mouth cancer</b>	<b>51.72</b>	53.41	53.13
<b>Vaccine and HPV</b>			
<b>Have you known about HPV vaccination?</b>	68.79	62.63	70.0
<b>When do you believe a HPV vaccine should be had?</b>	55.88	52.63	56.02
<b>Who should be vaccinate?</b>	71.71	75.75	70.98
<b>Preventive Behavior</b>			
<b>When you have sexual relations do you use condom?</b>	<b>52.95</b>	53.01	<b>51.22</b>
<b>Did you or your partner use condom in the last intercourse?</b>	<b>52.99</b>	<b>47.79</b>	53.11
<b>Pap Test and HPV</b>			
<b>Do you know Papanicolaou test?</b>	73.78	–	73.78
<b>After Vaccine what would be attitude towards the Pap smear?</b>	<b>87.37</b>	–	<b>87.37</b>

The table shows the absolute agreement in Pop-Brazil V6 following the questions from the score (range 0–14 for men and 0–16 for women). The variables were recategorized like a dichotomic measure (adequate and not adequate answers) for created the score. The absolute agreement was obtained from two halves from total sample. For the absolute agreement per gender, first we categorize the sample according gender and then split the in two halves for obtain the agreement.

this sample, in contrast with a previous study [41], and further analysis is needed.

Previous studies that have evaluated knowledge about HPV in Brazilian populations have restrained their samples to specific populations such as students [42–47], women [48–52] or healthcare professionals [53]. It is also important to note that mostly of these previous studies did not use validated instruments [43–47,54]. This use of a validated instrument is considered a major weakness by Manoel et al [53], who have previously adapted a questionnaire [55] but used a small female sample in one Brazilian city. Although there are different questionnaires to evaluate HPV [23,25,44–54], we chose the one developed by Saulle et al [25] because it combines sexual behavior, and knowledge about HPV, vaccine and Papanicolaou test in a short interview.

The majority of the results from questionnaires show that knowledge about HPV is “inadequate or insufficient” [58]. A review of studies performed in college-aged women showed that participants had a lack of information about HPV and the HPV vaccine [59]. Several other studies have reported similar results [33–45]. In this questionnaire, we decided to not classify the degree of knowledge as sufficient or insufficient because this is a subjective concept. Like other studies, our data identified a lack of basic knowledge and understanding regarding HPV and several specific points [33–35] but a greater recognition of the Papanicolaou test as a useful screening tool for cervical cancer.

Comparing the current results with those found in the original article [25], we found that participants had more knowledge regarding the diseases associated with HPV but less knowledge about vaccinations. These differences can be explained by the differences in sampling profiles, as Saulle et al. [25] included a sample of Italian university women.

It is important describe that this study has some weakness points, as we did not performance any classical measure for available internal consistency as Cronbach's alpha. However, it is prudent reminding that Cronbach's alpha has some limitations and the assumption for use Cronbach's alpha was not adequacy for this sample [60,61].

The importance this study is because the HPV is strongly associated with several types of cancer, and increasing public awareness of HPV should be a priority public health issue to encourage better preventive behaviors. Knowledge is a key point in increasing vaccination rates, and healthcare providers play a major role in providing information about HPV prevention for younger patients and parents. Identifying the gaps and the most vulnerable populations are major issues in maximizing educational interventions.

## Conclusion

The proposed questionnaire is the first instrument able to describe the knowledge, beliefs and behaviors regarding HPV of Brazilian women and men. The use of validated instruments allows comparisons between different populations and over time.

## Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.ejogrb.2018.09.023>.

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