

RESEARCH ARTICLE

Analysis of Knowledge Level in Brazilian Students about Human Papillomavirus Infection and Development of Penile Cancer

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Abstract

Introduction: Human papillomavirus (HPV), belonging to the Papovavirida family, is the most prevalent sexually transmitted disease (STD) agent worldwide. In Brazil, it is estimated that there are 3-6 million people infected with HPV. **Aim:** The aim of this study was to evaluate the knowledge of young male students about penis cancer related to HPV infection. **Methods:** This exploratory and quantitative study was conducted to analyze answers of 242 male students attending a private college located in Uberaba city, Minas Gerais state, Brazil, during 2015. **Results:** Most of the 242 participants (88.8%) affirmed having started sexual life very early, the majority (79.3%) were currently married and 69.8% had a single sexual partner. Regardless of their knowledge about HPV virus and its relationship with penis cancer, our data showed a general lack of awareness of the participants. **Conclusion:** Our results suggest that despite efforts to propagate information about HPV infection and its relation to penis cancer, the level of knowledge of students is low. Because of that, it is important to improve the information spread by media, emphasizing prevention and treatment of HPV infection in men.

Keywords: Papillomavirus infection- penile cancer- knowledge- university students

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Introduction

Human papillomavirus (HPV) belongs to the gender Papillomavirus, family Papillomaviridae and it presents circular, double-stranded and *non-enveloped DNA* (Xavier et al., 2007).

HPV is a world widely virus, which can be transmitted by direct or indirect contact with the injury carrier. HPV is mostly transmitted by sexual contact, the infection can be acquired after a single sexual relationship with an infected partner. After inoculation, the incubation time is within three weeks to eight months (Silva et al., 2013).

HPV is the most prevalent sexually transmitted disease (STD). There are 3-6 million people infected in Brazil. Around 3-5% of Brazilian people with active sexual life present HPV as a disease. (Queiroz et al., 2005).

Brazil is one of the countries with highest prevalence of HPV infection, registering around 137,000 new cases per year (Santos et al., 2011).

HPV infections are not always macroscopically visible, and they are classified in: I) Latent infection, which can be diagnosed by molecular biology tools. 'It probably occurs', because of an exposure to the virus, with further virus penetration in the host cell, without virus replication or even without complete virus maturation. This is the most common sexual disease in Brazil. II) Subclinical, with no clinical symptoms, but with alterations that can be detected by diagnostic methods such as: peniscopy, colpocitology, colposcopy, biopsy and clinically, when there are visible lesions (Xavier et al., 2007). The virus is also being associated to other cancer types, besides the cervical, anal and penis cancers.

There is correlation between HPV and epithelium, larynges and esophagus cancers, and it is already clear the correlation between HPV and head/neck cancers. The main transmission and propagation agent is the man, indirectly contributing to the high number of cervical neoplasias. (Santos et al., 2011).

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The main risk factor to the penis cancer is HPV and, in both genders, it is also associated to other neoplasia, causing benign lesions in the skin (warts) and in mucosal membranes (condyloma). In addition, HPV is associated to malignant lesions in the anus, vagina, oropharynx, larynx and bronchia. Recent data from research using molecular markers show that around 50% of penis carcinoma presents HPV DNA (Cubilla et al., 2010). However, data are not totally clear yet, some authors suggest that HPV detection in penis carcinoma can be correlated with 22,2-82,9% of cancer cases. These variable values might be related to problems in diagnostic methodologies or even lack of knowledge within the relation between HPV and penis cancer (Kirrander et al., 2011).

Diagnostic tracking and early treatment have presented high efficacy, being used as strategy approaches to change a prevention model based in lesions detections to biomolecular virus identification. The concept is to use a more sensitive test to detect early infections that can be severe before they achieve malignant stage (Santos et al., 2011).

Men difficulty to look for medical attendance is a crucial factor to the increase in the number of infections of infections related to HPV, the lack of knowledge causes absence of important information to a healthy life, because it avoids prevention. The vulnerability of these men group causes suffering to themselves and to their families as well and, besides, the public expenses with medical attendances and treatments may collaborate to the financial burden of public system of attention to health (Brasil, 2008).

Because of all that was exposed and because of the fast increase of infections by HPV and its close relation with penis cancer, the aim of this study was to evaluate the knowledge among male undergraduate students about penis cancer and its relation to HPV virus.

Materials and Methods

Study Design

This study is a research with quantitative interest, with the aim of evaluating the knowledge among undergraduate students from Faculdade de Talentos Humanos (FACTHUS), located at Uberaba/MG city, during the year of 2015. We interviewed 242 undergrads (around 3,000 students in total) belonged to diferents areas: Exacts, Humans, and Healthy. The students were divided in basic or intermediate-final groups, considering as basic the students who were between the first and second years of college, and intermediate-final the students who were between the third and fifth year.

We removed from the study all the female students and all the students that were attending to classes belonged to both groups, basic and intermediate-final.

Data was collected through a quiz with questions about HPV, preventive exam and penis cancer, as well as questions about social/demographic aspects. This in a developed and modified way to estimate the level of knowledge about the theme.

Volunteers were well directed about the questions by professionals. The participants of the study received the quiz with the instructions and orientation, and they

did not have limited time to answer it; the doubts from the participants were immediately answered by the professional who applied the quiz.

Ethical aspects

This study was approved by the Ethics Committee In Research from the Faculty of Human Talent, through the protocol number 0058/2015. All the students accepted to participate of the study as volunteers and they agreed with it by signing the Agreement Term.

Statistical Analyses

Continuous variables were described as median (confidence of 95%) and nominal variables were number of occurrence and percentage. Statistical analyses were done using the software SPSS 20. Logistic regression test was used to test the influence of the quiz variables to the knowledge about HPV infection and penis cancer. Statistical results were considered significant when $p < 0.05$.

Results

We interviewed 242 students attending to differents courses of FACTHUS. Their age were between 17 and 49 years old (median of 23), being 79.3% single and 20.7% married. Most of the interviewed (81.4%) do not have children; most of them are attending the first to the fifth college semester (71.9%). About parents educational level, most of them have complete high school (50.0% of paternal and 51.2% maternal education level).

About social behavior, data indicates that, independently of study area, most of the students (90.5%) does not have smoking habit. By the other hand, they initiated sexual life early (88.8%), before 20 years old; 69.8% have single sexual partner, being the partner a woman in 95% of the cases. Within the students 175 use condoms, being 72.3%. All these data can be visualized at Table 1.

Data presented at Table 2 show that 166 students belong to the Exact area, 59 belong to Human and 17 to the Health area. We can see that most of them are single (Exact 84.9%, Human 67.8% and Healthy 64.7%), with $p=0.006$. Most of the Exact area has been completed the basic formation of the college (80.1%), Human 52.5% and Health 58,8%, being $p=0.0001$. Independently of the area, the students do not smoke ($p=0.008$), initiated sexual life early ($p=0.045$), have single partner ($p=0.001$) and use condom ($p=0.019$). We can notice that the results presented at Table 1 and Table 2 do not change after study area split.

About the penis cancer knowledge (Table 3), putting together factors as knowledge about HPV infection, prevention methods, beginning of sexual life, condom use and single sexual partner, marital status and age, the results indicate that when the person knows about HPV infection there is 2.13 times more chance of knowing about penis cancer ($p=0.034$), and when the person is aware about prevention methods there is an increase of 4,4 times more chance of knowing about penis cancer ($p=0.0001$).

Data also indicates that single people has 2.37 times more chance of knowing what is penis cancer ($p=0.073$). People who study Health area presents between 2.77-2.56

Table 1. Data about General Population. Note: * students from 1st up to 5th period; ** students from 6th to 10th period

| Variable | Volunteer n = 242 |
|------------------------------|------------------------------|
| Age | Median (Range) 23 (17-49) |
| Marital Status | n (%) |
| Single | 192 (79.3) |
| Married | 50 (20.7) |
| Formation Period | n (%) |
| Basic* | 174 (71.9) |
| Intermediate-Final** | 68 (28.1) |
| Parent's Education | |
| Mother | n (%) |
| Elementary School Incomplete | 43 (17.8) |
| Complete primary education | 39 (16.1) |
| Complete High School | 124 (51.2) |
| Full Higher Education | 36 (14.9) |
| Father | n (%) |
| Elementary School Incomplete | 48 (19.8) |
| Complete primary education | 43 (17.8) |
| Complete High School | 121 (50.0) |
| Full Higher Education | 30 (12.4) |
| Smokes | n (%) |
| Yes | 9 (3.7) |
| No | 219 (90.5) |
| Sometimes | 14 (5.8) |
| Parenthood | n (%) |
| Yes | 45 (18.6) |
| No | 197 (81.4) |
| Sexual Activity | n (%) |
| Not started yet | 10 (4.1) |
| Before 20 years | 215 (88.8) |
| Before 25 years | 17 (7.0) |
| After 25 years | 0 (0.0) |
| Steady partner | n (%) |
| Yes | 169 (69.8) |
| No | 73 (30.2) |
| Partner's Gender | n (%) |
| Male | 8 (3.3) |
| Female | 230 (95.0) |
| Both | 4 (1.7) |
| Use of Condom | n (%) |
| Yes | 175 (72.3) |
| No | 67 (27.7) |

* Basic Cycle Students between 1st and 5th; ** Intermediate-final Cycle Students between 6th and 10th

times more chance of knowing what is penis cancer than people who study Exact or Human. Besides that, older students present between 2.38-3.4 times more chance of cancer knowledge than younger ones. Another factor that collaborates to the penis cancer knowledge is the beginning

of sexual life, showing that people who already initiated the sexual life have 2.35 times more chance of knowing what penis cancer is. However, the educational level (inside the college), single sexual partner, and condom use do not influence about the penis cancer knowledge.

Discussion

HPV infection has been described as a risk factor to the development of cancers in the male genital tract, including penis cancer (Wilkin and Chiasson, 2004). This way, this study was made to show the knowledge of young undergrads about HPV infections and its relation with penis cancer.

Our study indicates that the participants were young, with an average age of 23 years old. Thinking about that, we need to take in consideration that penis cancer caused by HPV infection has been observed mostly in young men (Micali et al., 2006). Thus, the information received by people about this theme and manners of prevention may be an important tool to fight against penis cancer caused by HPV infection. Our study showed that many men are exposed to HPV infection because most of them began their sexual life very early, however, part of them affirm to use condom, which is the main way of preventing sexual diseases. Considering that HPV is a sexual transmitted disease (STD), the premature beginning of sexual life may be a risk factor to the disease development, so this study data corroborates with Costa and Goldenberg (2013) that shows the first sexual relationship happens before 20 years old. These data are reinforcing the data of Silva et al., (2013) that indicated that most of the participants were single and that their relationship with several partners could contribute to increase the risk of HPV infection. Besides, the study of Conti et al., (2006) showed that within the interviewed, more than 60% used condom during sexual activities. Other data from national and international literature, indicate an increase of condom use by young population, which is happening because of several awareness campaigns, about STDs and pregnancy prevention (Veira et al., 2004).

According to Pinto and collaborators (2011), the sociocultural, political and economical aspects are important criteria to be related to the vulnerability, such as educational level, life habits, access to health services and prevention of STDs. It is important to mention that the participants of this study were undergrad students, which allow us to think that they have access to quality information and that they have basic knowledge about diseases prevention, such as HPV infection. This way, we notice that in spite of they have access to information about penis cancer prevention, the knowledge level of the students about this theme was different among them, indicating that the students who have known about HPV already know better about penis cancer prevention. However, most of the participants reported that they do not know about HPV.

The results about knowing what HPV is and how to prevent its infection are according to the results found by Sepúlveda-Carrillo et al., (2014), who did a literature review about sexuality, knowledge, prevention

Table 2. Population Data Separated by Training Areas. Note: * Students from 1st to 5th period; ** students from the 6th to the 10th period

| Variable | Volunteer Exact Courses n = 166 | Volunteer Human Courses n = 59 | Volunteer Health Courses n = 17 | P Value |
|------------------------------|------------------------------------|-----------------------------------|------------------------------------|---------|
| Age | Median (Range) 21 (17-48) | Median (Range) 26 (18-49) | Median (Range) 26 (18-45) | NS |
| Marital Status | n (%) | n (%) | n (%) | |
| Single | 141 (84.9) | 40 (67.8) | 11 (64.7) | 0.006 |
| Married | 25 (15.1) | 19 (32.2) | 6 (35.3) | |
| Formation Period | n (%) | n (%) | n (%) | |
| Basic* | 133 (80.1) | 31 (52.5) | 10 (58.8) | 0.0001 |
| Intermediate-Final** | 33 (19.9) | 28 (47.5) | 7 (41.2) | |
| Parent's Education | | | | |
| Mother | n (%) | n (%) | n (%) | |
| Elementary School Incomplete | 27 (16.3) | 11 (18.6) | 5 (29.4) | NS |
| Complete primary education | 27 (16.3) | 9 (15.3) | 3 (17.6) | |
| Complete High School | 90 (54.2) | 26 (44.1) | 8 (47.1) | |
| Full Higher Education | 22 (13.3) | 13 (22.0) | 1 (5.9) | |
| Father | n (%) | n (%) | n (%) | |
| Elementary School Incomplete | 32 (19.3) | 9 (15.3) | 7 (41.2) | NS |
| Complete primary education | 29 (17.5) | 12 (20.3) | 2 (11.8) | |
| Complete High School | 87 (52.4) | 27 (45.8) | 7 (41.2) | |
| Full Higher Education | 18 (10.8) | 11 (18.6) | 1 (5.9) | |
| Smokes | n (%) | n (%) | n (%) | |
| Yes | 2 (1.2) | 5 (8.5) | 2 (11.8) | 0.008 |
| No | 154 (92.8) | 52 (88.1) | 13 (76.5) | |
| Sometimes | 10 (6.0) | 2 (3.4) | 2 (11.8) | |
| Parenthood | n (%) | n (%) | n (%) | |
| Yes | 22 (13.3) | 19 (32.2) | 4 (23.5) | 0.005 |
| No | 144 (86.7) | 40 (67.8) | 13 (76.5) | |
| Sexual Activity | n (%) | n (%) | n (%) | |
| Not started yet | 9 (5.4) | 1 (1.7) | 0 (0.0) | 0.045 |
| Before 20 years | 9 (5.4) | 4 (6.8) | 4 (23.5) | |
| Before 25 years | 148 (89.2) | 54 (91.5) | 13 (76.5) | |
| After 25 years | 0 (0.0) | 0 (0.0) | 0 (0.0) | |
| Steady partner | n (%) | n (%) | n (%) | |
| Yes | 110 (66.3) | 45 (76.3) | 14 (82.4) | NS |
| No | 56 (33.7) | 14 (23.7) | 3 (17.6) | |
| Partner's Gender | n (%) | n (%) | n (%) | |
| Male | 162 (97.6) | 56 (94.6) | 12 (70.6) | 0.001 |
| Female | 4 (2.4) | 1 (1.7) | 3 (17.6) | |
| Both | 0 (0.0) | 2 (3.4) | 2 (11.8) | |
| Use of Codon | n (%) | n (%) | n (%) | |
| Yes | 129 (77.7) | 35 (59.3) | 11 (64.7) | 0.019 |
| No | 37 (22.3) | 24 (40.7) | 6 (35.3) | |

methods and vulnerability to HPV infection, and when they analysed 766 papers, they found out that at least 1% of men understand the severity of HPV infection, and this study also revealed that most of men relate HPV only to women infections. The study of Silva et al., (2013) showed that 58% of interviewed men did not have any

knowledge about HPV. These data reveal that there is an important need of actions with the aim of getting to those people who is sexual active and can be spreading infection just because of lack of knowledge.

Presenting the ways of viral transmission and infection prevention should guarantee the reduction of

Table 3. Students' Knowledge about Penile Cancer Related to Sociodemographic and Behavioral Factors (Multivariate Analysis by Linear Regression). Note: * students from 1st to 5th period; ** students from the 6th to the 10th period

| Variable | Volunteer n = 242 | Knowledge About Penile Cancer | P Value |
|--------------------------------|-------------------|-------------------------------|---------|
| Knowledge about HPV | n (%) | OR (95%IC) | |
| Yes | 81 (33.5) | 2.13 (1.06-4.27) | 0.034 |
| No | 161 (66.5) | 1 | |
| Knowledge about HPV prevention | n (%) | OR (95%IC) | |
| Yes | 122 (50.4) | 4.41 (2.20-8.82) | 0.0001 |
| No | 120 (49.6) | 1 | |
| Marital Status | n (%) | OR (95%IC) | |
| Single | 192 (79.3) | 2.37 (0.92-6.07) | 0.073 |
| Married | 50 (20.7) | 1 | |
| Age | n (%) | OR (95%IC) | |
| Under 18 years | 69 (28.5) | 0.29 (0.07-1.20) | 0.088 |
| 19-30 years | 125 (51.7) | 0.42 (0.17-1.02) | 0.056 |
| Over 30 years | 48 (19.8) | 1 | |
| Formation Period | n (%) | OR (95%IC) | |
| Basic* | 174 (71.9) | 1.15 (0.55-2.41) | NS |
| Intermediate-Final** | 68 (28.1) | 1 | |
| Formation Field | n (%) | OR (95%IC) | |
| Exact | 166 (68.6) | 0.36 (0.09-1.35) | NS |
| Human | 59 (24.4) | 0.39 (0.09-1.59) | NS |
| Health | 17 (7.0) | 1 | |
| Sexual Activity | n (%) | OR (95%IC) | |
| Not started yet | 10 (4.1) | 1 | |
| Before 20 years | 215 (88.8) | 2.22 (0.35-14.23) | NS |
| Before 25 years | 17 (7.0) | 2.58 (0.26-25.32) | NS |
| Steady partner | n (%) | OR (95%IC) | |
| Yes | 169 (69.8) | 1.10 (0.53-2.21) | NS |
| No | 73 (30.2) | 1 | |
| Use of Codon | n (%) | OR (95%IC) | |
| Yes | 175 (72.3) | 1.37 (0.61-3.07) | NS |
| No | 67 (27.7) | 1 | |

men infection and consequently reduce the infection in their partners. Grigol and Facio-Junior (2013) showed higher incidence of HPV infection within men between 17-30 years old (61.7%), what shows the importance of awareness campaigns directed to this age group, because this group is vulnerable to infection, since they have poor knowledge and no perception about HPV infection.

Pelucchi et al., (2010) reveals the need of more health services related to identification of damages related to HPV infection, because modification on people behavior would happen only by information passed directly to target population. Besides, prevention methods such as vaccines and condoms should lead to drop in 90-70% the number of genital and cervical warts in women, and drop around 40% the number of men with genital warts (Einstein et al., 2011).

It is worrying the level of knowledge about penis cancer and its prevention. Because of the early beginning of sexual life and the lack of knowledge about HPV infection, young people have been the most part of infected people, being the penis cancer more notable among them.

The results obtained in this study are in agreement with the results found by Reis (2010), that conclude 64.5% of undergrads do not recognize the relationship between HPV and penis cancer. These data, as ours, indicate that there is carelessness and vulnerability by young men about the HPV infection and possible complications, such as penis cancer. It is worth pointing out that the participants of our study attend to a private college and have access to different kinds of media, which shows us that prevention campaigns and information strategies are still inefficient.

Our results suggest that besides of all the effort to propagate information about HPV infection and its relation to penis cancer, the level of knowledge of the students is low. This is a worrying fact, since the participants are part of superior education and have full access to information. Because of that, it is important to improve the information spread by media, emphasizing prevention and treatment of HPV infection in men. Besides, it is important to create strategies for health professionals to be trained to inform people, contributing to reduce the number of infections.

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