Human papillomavirus among medical students at a federal public university

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ABSTRACT

OBJECTIVE: Analyze the vaccination status against the human papillomavirus among students at the School of Medicine of the Federal University of Juiz de Fora. **METHODS:** It is an observational cross-sectional study that aims to identify and analyze the characteristics and variables that relate to the vaccination status against the human papillomavirus of students at the School of Medicine of the Federal University of Juiz de Fora. The data were collected using standardized online questionnaires. **RESULTS:** Among the participants, 176 (49.2%) claimed to have been vaccinated against the virus and had received at least one dose of the vaccine. Among those surveyed, 74 (20.7%) students reported having taken 3 doses, while 89 (24.9%) took 2 and 13 (3.6%) took only 1 dose. Regarding the vaccinated in the age group covered by the public network, 62 (17.3%) are female (9-14 years old) and 12 (3.4%) are male (11-14 years old). A total of 66.66% of the students who have already had some injury by the virus, were not vaccinated. **CONCLUSION:** This study showed that, as with the Brazilian population in general, the vaccination status against human papillomavirus among students at the School of Medicine of the Federal University of Juiz de Fora is below expectations. The main reason reported for non-vaccination was not being part of the age group included in the vaccination of the public network. It was also found that the prevalence of lesions by Human Papillomavirus in vaccinated was lower than in non-vaccinated, emphasizing the need for the vaccine to prevent lesions caused by the virus.

Keywords: Papillomavirus vaccines, Papillomavirus infections, Papillomaviridae, Medical students, Vaccination coverage.

INTRODUCTION

Currently, human papillomavirus (HPV) infection is the most prevalent Sexually Transmitted Infection (STI) among the sexually active population in the world. The HPV virus has several subtypes, which are divided into high and low oncogenic risk. Subtypes 16 and 18 are the most commonly associated with cervical cancer, besides anal, penile, vaginal, oral, among others. Subtypes 6 and 11 are the main causes of benign lesions, such as anogenital warts[1].

In Brazil, between 2015-2017, an epidemiological study was developed (POP-BRASIL) to investigate the national coverage of HPV infection. It showed that the overall prevalence of HPV, that is, at least one subtype of the virus, was 53.6%, and of this population, 35.2% were infected by at least one subtype of high-risk HPV. The study also revealed that only about 50% of this sample used condoms during sexual intercourse, that is, they continued to transmit HPV sexually[2].

The transmission of HPV occurs through simple genital skin-to-skin contact[3] and can be responsible for infections that, for the most part, regress spontaneously. However, if they become persistent, they can evolve to cause cancer, the main one being cervical cancer, but also the vulva, vagina, anus, penis and oropharynx[4].

Nowadays, the vaccines used against human papillomavirus subtypes have a prophylactic character, aiming to prevent the infection and permanence of this virus in the different sites[5]. Together with the recommended screening and early treatment of pre-neoplastic lesions, they contribute to the reduction of the incidence of cervical cancer, and, consequently, the mortality related to it[6,7]. The vaccines available worldwide have bivalent protection (against subtypes 16 and 18), tetravalent (against subtypes 6, 11, 16, and 18), and nonavalent (against subtypes 6, 11, 16 and 18, 31, 33, 45, 52, and 58). [8]

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In Brazil, the vaccine available in the public system is tetravalent, which is currently available through the Unified Health System (SUS)[8]. However, it is also available in the private health system outside the age range recommended by the SUS. The vaccine was incorporated into the SUS in 2014 through the National Immunization Program (PNI), and, as of 2017, the two-dose vaccination schedule (0 and 6 months) began to cover boys aged 11 to 14 years and girls aged 9 to 14 years. People living with HIV/AIDS; transplanted from solid organs, as well as from bone marrow; and cancer patients are also included in the target audience, in which the administration of three doses (0, 2, and 6 months) is recommended[7], being women up to 45 years of age and men up to 26 years[9].

According to the Ministry of Health, the objective is to achieve a vaccination coverage rate of 80% for the first and second doses in the target population[7,10]. In the year in which vaccination was implemented, the vaccination strategy in schools, together with the SUS health units, made it possible to achieve vaccination coverage of 85% in the first dose (D1). However, in view of the disclosure of some adverse events in the media, the coverage rate of the second dose (D2) dropped to 60% in 2014[7].

The vaccines against HPV are highly effective in protecting against infection of the subtypes included in it[10]. Systematic reviews and meta-analyses confirm the positive impact of vaccination. After 10 years of vaccine implementation in developed countries, such as the USA and Australia, a statistically significant drop in infections by the genotypes covered was observed, as well as cross-protection against other subtypes with high or low oncogenic risk. This meant a reduction in the prevalence of genital warts and cervical intraepithelial lesions[11].

However, the significant reduction in diseases caused by the virus is directly related to high rates of vaccine coverage, especially when its administration is done before the first sexual exposure, when its effectiveness is maximum.[12,13]. However, one should not ignore the vaccination of women after the beginning of sexual life and in those who already had cervical lesions by HPV, in which studies have also shown protection effectiveness against other subtypes of the virus[13].

In this sense, the present study aimed to analyze the vaccination situation against HPV among students at the School of Medicine of the Federal University of Juiz de Fora (UFJF), emphasizing the importance of vaccination as the main method to prevent diseases caused by HPV.

METHODOLOGY

This cross-sectional observational study aims to identify and analyze the characteristics and variables that relate to the HPV vaccination status of students at the UFJF School of Medicine. The research was approved by the Research Ethics Committee of the Federal University of Juiz de Fora (CEP/UFJF) under protocol number 4.861.978.

Among 1080 UFJF medical students, who constitute the target population, 358 participated in the research, including academics from the 1st to the 12th period. Data were collected between July and September 2021, through standardized online questionnaires, through Google Forms, containing seven multiple-choice questions, in addition to three initial topics on identification filled in with CPF, gender and age.

The questions were answered after the respondents declared that they agreed with the Free and Informed Consent Term (FICT) contained on the first page of the questionnaire. Participants' e-mails, as well as any other form of personal identification, were not disclosed by the researchers, and total secrecy regarding the identity of those surveyed was maintained.

The questions, which covered aspects related to vaccination, aimed to identify: Whether students are vaccinated and, if so, at what age they were vaccinated; if they were vaccinated, they were vaccinated through the public or private network; if at least the first dose was before the first sexual intercourse; which vaccine was received (bivalent or tetravalent) and the number of doses taken (one, two or three) by those who had already been vaccinated; if the target population has already presented any lesion caused by HPV; in addition to the main reasons that led to non-vaccination if they had not taken any dose.

Statistical data analysis was performed, and the percentage of students' vaccination coverage was evaluated, in addition to the study of other variables. Data were described by mean and standard deviation (quantitative variables) and absolute and relative frequencies (qualitative variables). Calculations were performed using SPSS v14 software.

RESULTS

Responses were obtained from 358 students from the UFJF School of Medicine, 204 female (57%) and 154 male (43%). The mean age of those surveyed was 21.4 years.

Among the participants, 176 (49.2%) claimed to be vaccinated against HPV, which means they received at least one dose of the vaccine, while 182 (50.8%) denied having received the vaccination. Among those surveyed, 74 (20.7%) students reported having taken the 3 required doses of the vaccine, 89 (24.9%) had taken 2 doses and 13 (3.6%) had only taken 1 dose.

Table 1 contains data regarding the reasons that the 182 students who had never been vaccinated attributed to the fact that they had not been vaccinated.

Table 1
Reasons attributed to non-vaccination among unvaccinated students.

Variables	N (%)
It was not part of the age group included in the vaccination of the public network	85 (46.7%)
I don't know why I didn't get vaccinated	36 (19.8%)
Vaccine value in the private network	25 (13.7%)
I did not receive medical advice to vaccinate	23 (12.6%)
I'm not sexually active	5 (2.7%)
I didn't know about this vaccine	5 (2.7%)
Fear of side effects	3 (1.6%)

Among the students who were vaccinated, when asked which vaccine they had received, 101 (57.3%) reported having taken the quadrivalent vaccine through the public network, 55 (31.25%) claimed to have taken the quadrivalent vaccine through the private network, while 20 (11.3%) acquired the bivalent vaccine through the private network.

Table 2 presents data on the vaccine received by female students, while Table 3 shows data regarding the vaccine received by male respondents. When analyzing them, it is possible to notice a higher prevalence of vaccination among females (9-14 years old) compared to males (11-14 years old).

Table 2
Vaccination received by female students from the Faculty of Medicine of the Federal University of Juiz de Fora, aged between 9 and 14 years.

Variables	N (%)
9 to 14 years old – by PNI/SUS	62 (17.3%)
9 to 14 years old – through the private network	25 (7.0%)
Total	87 (24.3%)

PNI: National Immunization Program; SUS: Unified Health System

Table 3
Vaccination received by male students from the Faculty of Medicine of the Federal University of Juiz de Fora, aged between 11 and 14 years.

Variables	N (%)
11 to 14 years old – by PNI/SUS	12 (3.4%)
11 to 14 years old – through the private network	7 (2.0%)
Total	19 (5.4%)

PNI: National Immunization Program; SUS: Unified Health System

In addition, 70 (19.6%) students claimed to have taken the vaccine when they were 15 or older (age group not covered by the PNI), regardless of gender.

Regarding those vaccinated, 134 (76.1%) reported having taken at least the first dose of the vaccine before their first sexual intercourse.

When asked if they had ever had any injury caused by HPV, 349 (97.5%) students denied it, while nine (2.5%) said they had already. Among the nine who already had lesions, six were not vaccinated (66.66%).

DISCUSSION

Despite medical advances regarding the diagnosis, treatment and prevention of HPV infection, it is notable that the knowledge of the general population about the infection and its possible consequences is limited. When it comes to medical students, as in the present study, vaccination coverage should reach more significant levels since this group has a higher level of technical knowledge about diseases than the population that does not work in the health area.

However, it is important to emphasize that knowledge about HPV is greater in the medical course

compared to other courses, as found in the study by Biselli-Monteiro et al.[14], when comparing medical students in relation to nursing, speech therapy, and pharmacy students. The same was detected by Monteiro et al.[15], when comparing medical students with literature students.

Despite all the information available to health academics, our research showed that less than half of the students had been vaccinated with at least one dose, showing a rate that is still quite unsatisfactory. When compared with the Brazilian vaccination coverage, we can observe a reflection of the reality in Brazil, according to information from the PNI-DATASUS[16]. There are clear differences, however, when we compare the study population that completed their vaccination schedule, with more than one dose, with the Brazilian population. In some states of Brazil, the difference between vaccination coverage between the first and second doses drops to half[16]. It should be mentioned that few studies were found on vaccination coverage against HPV in people outside the age range included in the PNI campaigns.

In our research, a considerably higher vaccination rate was observed among females than males, data compatible with the results of other studies that corroborate the fact that the female population actually reaches higher vaccination rates[17]. This is evidenced by the data found in Kops et al.[18] and Kontos et al.[19], which showed that women reported having more knowledge about the HPV vaccine and cervical cancer than men. A possible reason that knowledge is greater among females is based on the fact that coverage and vaccination campaigns, initially, were directed only to women in Brazil and the world, essentially favoring female education[14].

Regarding the reasons why the respondents did not vaccinate, the main reason stated was the fact that they were not part of the age group included in the vaccination of the public network. This is due to the fact that, in Brazil, the institution of the quadrivalent vaccine against HPV was instituted in 2014, with girls aged between 9-13 years as the target population of the campaign[20]. As the average age among the participants in this research was 21.4 years, they had already passed the age limit for the first vaccine dose that year. The price of the vaccine in the private network was also a reason for students not to use it, with the rate found similar to that found by Liddon et al.[21], in a study carried out in the United States, of 10.4%.

A Swiss study by Amadane et al.[22] with undergraduate health students who had not been vaccinated revealed that 19% of them had a reason not to receive enough information. According to Liddon et al.[21], nearly 10% said they did not know enough about the HPV virus itself and 5.6% did not know enough about the vaccine. Brazilian studies corroborate this thought and extrapolate the area of health, noting equally important ignorance among all students. A Brazilian study published in 2021[23] showed that from 102,301 Brazilian students, 18.19% of men were not even aware of the existence of the HPV vaccination campaign. Our research corroborated these data since one of the reasons for not vaccinating was the report that students did not receive medical advice to get vaccinated or even that they did not know about this vaccine. The fear of side effects was much lower than that found by Liddon et al.[21] (11,8%) and Amadane et al.[22] (21,6%). In addition, not being sexually active presented a similar value to that found in the study by Amadane et al.[22], of 1,6%.

Notably, people who have received the vaccine have a lower prevalence of HPV infection. T.C. Wright Jr et al. [24] study compared vaccinated and unvaccinated women by age group and found a significantly lower prevalence ($p < 0.001$) of infection by 14 subtypes of the virus in vaccinated women, with emphasis on genotypes 16 and 18. In our study, a high percentage of those surveyed who reported having already presented HPV lesions were not vaccinated.

CONCLUSION

This study showed that, as with the Brazilian population in general, the vaccination status against HPV among students at the School of Medicine of the Federal University of Juiz de Fora (UFJF) is below expectations. The main reason reported for non-vaccination was not being part of the age group included in the vaccination of the public network. It was also found that the prevalence of lesions by HPV in vaccinated was lower than in non-vaccinated, emphasizing the need for the vaccine to prevent lesions caused by HPV.

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