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KNOWLEDGE AND ATTITUDES AMONG DENTISTRY STUDENTS OF MEDICAL FACULTY OF THE UNIVERSITY OF NIS TOWARDS HPV VACCINATION

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Human Papillomavirus (HPV) is one of the most common infections, and the only way for prevention is through vaccination against HPV-related disease (HPV vaccination), whose advocates should be dentistry students, as future healthcare workers. Our study included 57 undergraduate and graduate dentistry students, whose knowledge and attitudes were investigated through an online survey. The results have shown satisfactory knowledge of respondents related to HPV spreading and consequences, and HPV vaccination rate of 22.8%, which was more prevalent among female students. Although the vaccination rate was low, about 75.4% of respondents declared their belief in vaccination in general. Positively, there was a higher percentage answering that they would vaccinate their future children (52.6%), and claiming that they would recommend the HPV vaccine to people in their surroundings (71.9%). Students gathered most of this subject-related information in their elementary/high schools, faculties and on the internet/social media, suggesting that they could benefit from getting more information and education related to HPV and HPV vaccines. When it comes to population education and HPV vaccine promotion, they mostly agreed that high school and grades 5-8 of elementary school would be the best starting point. Also, due to a growing internet and social media influence, their opinion is that proper education material spreading on these platforms could also contribute to general awareness and the HPV vaccination rate increase, as well as the reduction of the appearance of genital warts, precancerous lesions and cancers related to HPV infection.

Keywords: HPV; vaccination; HPV vaccination; students; dentistry students

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ZNANJE I STAVOVI STUDENATA STOMATOLOGIJE MEDICINSKOG FAKULTETA UNIVERZITETA U NIŠU PREMA HPV VAKCINACIJI

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Humani papiloma virus (HPV) jedna je od najčešćih infekcija, a jedini način prevencije je vakcinacija protiv bolesti povezanih HPV-om (HPV vakcinacija), čiji zagovornici bi trebalo da budu studenti stomatologije, kao budući zdravstveni radnici. Naša studija je obuhvatila 57 studenata stomatologije i apsolvenata, čije su znanje i stavovi ispitani putem *online* ankete. Rezultati su pokazali zadovoljavajuće znanje ispitanika u vezi sa širenjem i posledicama HPV-a, kao i stopu vakcinacije protiv HPV-a od 22,8%, koja je bila zastupljenija među studentkinjama. Iako je stopa vakcinacije bila niska, oko 75,4% ispitanika je izjavilo da veruje u vakcinaciju uopšte. Pozitivna je i činjenica da je veći procenat odgovorio da bi vakcinisali svoju buduću decu (52,6%) i da bi preporučili HPV vakcinu ljudima u svom okruženju (71,9%). Većinu informacija vezanih za ovu temu student su stekli tokom svog osnovnog i srednjeg obrazovanja, na fakultetu i putem interneta/društvenih mreža, ističući da bi im dodatne informacije i edukacija o HPV-u i HPV vakcinama bili jako korisni. Kada je u pitanju edukacija stanovništva i promocija HPV vakcine, veći deo ispitanika se složio da bi srednje škole i učenici 5-8. razredi osnovnih škola, predstavljali najadekvatnije polazište za sprovođenje edukativnih aktivnosti. Takođe, zbog rastućeg uticaja interneta i društvenih mreža, njihovo mišljenje je da bi širenje adekvatnog edukativnog materijala na ovim platformama takođe moglo doprineti opštoj svesti i povećanju stope HPV vakcinacije, kao i smanjenju pojave genitalnih bradavica, prekanceroznih lezija i karcinoma povezanih sa HPV infekcijom.

Ključne reči: HPV; vakcinacija; HPV vakcinacija; studenti; studenti stomatologije

INTRODUCTION

The most common viral infection of the reproductive system is the Human Papillomavirus (HPV) infection, which affects both genders. Most HPV infections are asymptomatic and resolve spontaneously, but some untreated persistent infections can lead to precancerous lesions, and further to cancer. The vaccination worldwide first started in 2006, with the development of the first vaccine for the prevention of HPV-related disease (HPV vaccine), and the instructions are to be administered before first sexual intercourse (1).

According to the Republic of Serbia, HPV vaccination is not part of the mandatory national immunization program, and is recommended for children and adolescents aged 9–19 years (2). Since 2022, the nine-valent HPV vaccine has been introduced in Serbia, which is applicable to both boys and girls. Although the vaccine is recommended for children aged 9-19, the main focus is on adolescent vaccination, since they represent a high-risk group for HPV infection. Otherwise, children's vaccination brought a lot of concerns and controversy among the public, primarily parents, since their consent is necessary. Whereas HPV immunization can be obstructed by parents' attitudes, there is an exigency for well-educated professionals in the field of medicine to explain to them the process and benefits of HPV vaccination (3).

Health science students are future healthcare professionals, and regarding health matters, including vaccination, they usually enjoy the trust of the patients (4). Besides genital, there is a large number of oral cavity and oropharynx cancers related to HPV infection, where dentists are the first line of healthcare providers who assess them. Given that dentists have an evolving role in the diagnosis of oral manifestations of HPV-related disease, their role in the prevention of HPV infections, such as HPV vaccination, should also be enlarged (5).

Dentistry students, as future healthcare providers, are a significant link in the chain of disease prevention. It is very important to focus on their attitudes and knowledge, as well as on possibilities for their improvement, in order for them to serve as a tool for further population informing.

OBJECTIVE

This study primarily aimed to determine dentistry students' attitudes toward HPV vaccination, and to identify ways to improve their knowledge and willingness to receive HPV

vaccines. The second aim was to determine differences in attitudes and knowledge depending on gender and the year of studying.

MATERIALS AND METHODS

The study was designed as an online survey and conducted from November 1 to December 31, 2025, and was approved by the Ethical Board of the Faculty of Medicine, University of Nis (No. 12-13346-1/2-8, date: 28.10.2025). The study involved 57 undergraduate and graduate dentistry students of the Faculty of Medicine, University of Niš, and access to the questionnaire was voluntary. Participants' attitudes and knowledge were investigated using a questionnaire, aimed to obtain information on socio-demographic data, perspectives and understanding about HPV vaccination, attitudes and knowledge about vaccination in general, vaccination status, and previous experience with vaccines.

RESULTS

The respondents were 57 undergraduate and graduate students of the Dentistry program at the Faculty of Medicine, University of Niš, Serbia. The average age of the study population included was 22.7 years (min 19, max 30). According to the demographic data, 68.4% (n=39) of participants were female, and 31.6% (n=18) were male, suggesting that females responded better to online questions. More than half of respondents were single, 56.1% (n=32), while 40.4% (n=23) were in a relationship, and only 3.5% (n=2) were married. The same number of respondents were unemployed and came from a city environment - 89.5% (51), and 10.5% (6) were employed and came from a rural environment. Respondents were different years of studying – 4 (7%) of them were 1st, 9 (15.9%) were 2nd, 15 (26.3%) were 3rd, 6 (10.5%) were 4th, 4 (7%) were 5th, and 6 (10.5%) were 6th year of studying, while 13 (22.8%) of them were graduate students. The average grade of respondents is 8.61, and all of these results have been presented in Table 1.

Table 1. Socio-demographic data

	Number	%
Gender:		
Male	18	31.6 %
Female	39	68.4 %
Average age:	22.54	
Marital status:		
Single	32	56.1 %
In a relationship	23	40.4 %
Married	2	3.5%
Professional status:		
Employed	6	10.5 %
Unemployed	51	89.5 %
What kind of environment do you come from:		
City environment	51	10.5 %
Rural environment	6	89.5 %
Year of studying:		
1.	4	7 %
2.	9	15.9 %
3.	15	26.3 %
4.	6	10.5 %
5.	4	7 %
6.	6	10.5 %
Graduate student	13	22.8 %
Average grade:	8.61	

Table 2 summarizes information and knowledge related to HPV, as well as attitudes and knowledge towards HPV vaccines. However, the majority of respondents (n=45, 78.9%) declared that they had sexual intercourse, and most of them had 1-2 sexual partners (n=26, 45.6%) until the moment of filling out the survey. Everyone stated that they had heard of HPV, where more than half of them for the firstly heard in elementary or high school (n=31, 54.4%). The primary sources of information related to HPV were elementary and high schools (n=17, 29.8%), as well as the internet and social media (n=17, 29.8%). When it comes to self-assessment of HPV-related knowledge and information, nearly half of them (n=29, 50.9%) reported having sufficient knowledge on this topic. At the same time, the number of those who think they don't have enough knowledge was the same as the number of those who find their knowledge quite satisfactory (n=13, 22.8%). Yet, the vast majority (n=49, 86%) know that HPV causes genital warts, while eight respondents (14%) haven`t had this information. It is even a bigger number of participants (n=55, 96.5%) who know that there is a connection between HPV infection and cancers.

Table 2. Attitudes and knowledge related to HPV and vaccination

	Number	%
Have you had sexual intercourse yet:		
Yes	45	78.9 %
No	12	21.1 %
I would rather not answer	/	/
Number of sexual partners:		
0	12	21.1 %
1-2	26	45.6 %
3-5	12	21.1 %
More than 5	4	7 %
I would rather not answer	3	5.2 %
Have you heard of Human Papillomavirus (HPV):		
Yes	57	100 %
No	/	/
Where have you first heard of HPV:		
Doctor/Healthcare facility	8	14 %
Internet/Social media	7	12.3 %
TV/Radio/Newspaper	/	/
Elementary/High school	31	54.4 %
Faculty	3	5.3 %
Parents	3	5.3 %
Friends	5	9 %
Other	/	/
Main source of information related to HPV:		
Doctor/Healthcare facility	12	21.1 %
Internet/Social media	17	29.8 %
TV/Radio/Newspaper	/	/
Elementary/High school	9	15.9 %
Faculty	17	29.8 %
Parents	2	3.4 %
Friends	/	/
Other	/	/
How would you describe your knowledge and the information you have on HPV		
I don`t have enough knowledge	13	22.8%
I know enough	29	50.9%
Quite satisfactory	13	22.8%
I haven`t thought about that	2	3.5%
Did you know that HPV causes genital warts (condyloma) in both males and females:		
Yes	49	86 %
No	8	14 %
Did you know that HPV causes a large number of cancers (vulval, vaginal, penis, anal, mouth, and throat cancer) and it`s the leading cause of cervical carcinoma in females:		
Yes	55	96.5 %
No	2	3.5 %
Did you know that there is a vaccine against HPV-related diseases:		
Yes	57	100
No	/	/
Who have you heard from about HPV vaccines:		
Doctor/Healthcare facility	17	29.9 %
Internet/Social media	12	21.1 %
TV/Radio/Newspaper	/	/
Elementary/High school	10	17.5 %
Faculty	10	17.5 %
Parents	4	7 %
Friends	4	7 %
Other	/	
Have you been vaccinated with HPV vaccine:		
Yes	13	22.8 %
No	44	77.2 %
Do you know someone who has been vaccinated with HPV vaccine:		
Yes	39	68.4 %
No	18	31.6 %
Do you consider the HPV vaccine as effective:		
Yes	33	57.9 %
No	1	1.8 %

Maybe	23	40.3 %
When do you think is the best time for getting vaccinated with HPV vaccine:		
Before having first sexual intercourse	48	84.2 %
After having sexual intercourse/s	/	/
Anytime in a lifetime	3	5.3 %
I don`t know	6	10.5 %
Which institution, in your opinion, should practice education about HPV and HPV vaccines (students could choose more than 1 answer):		
Elementary school	25	17.7 %
High school	49	34.8 %
Faculty	30	21.3 %
Health center/ambulance	25	17.7 %
Hospital	11	7.8 %
I don`t know	1	0.7 %
Would you get vaccinated with HPV vaccine:		
Yes	26	45.6 %
Yes, if the vaccine is free	10	17.5 %
No	5	8.8 %
Maybe	16	28.1 %
Would you get your kids vaccinated with HPV vaccine:		
Yes	30	52.6 %
Yes, if the vaccine is free	3	5.3 %
No	3	5.3 %
Maybe	21	36.8 %
Would you recommend HPV vaccine to people in your surroundings:		
Yes	41	71.9 %
No	2	3.5 %
Maybe	14	24.6 %
Do you consider it necessary to have more information and education related to HPV and HPV vaccines:		
Yes	39	68.4 %
No	18	31.6 %
What, in your opinion, would be the best way to educate the population about HPV and HPV vaccines (students could choose more than 1 answer):		
Social networks	41	20.8 %
Grandstands	11	5.6 %
Polls	15	7.6 %
Preschools and Primary schools	23	11.7 %
High schools	44	22.3 %
Faculties	39	19.8 %
Television	22	11.2 %
I don't know	2	1 %
Which, in your opinion, would be the best age category when you should start education about HPV and HPV vaccines:		
Elementary school (grades 1-4)	2	3.5 %
Elementary school (grades 5-8)	17	29.8 %
High school	35	61.4 %
Faculty	1	1.7 %
Primary health care institutions	1	1.7 %
I didn't think about it	1	1.7 %
Do you consider vaccination in general as effective:		
Yes	43	75.4 %
No	1	1.8 %
I don`t know, I need more information	13	22.8 %

Similar to hearing about HPV, all of the respondents have heard of the vaccine against HPV-related diseases (HPV vaccine), too. Most of them (n=17, 29.9%) have heard of HPV vaccines for the first time from a doctor or in a healthcare facility, further (n=12, 21.1%) on the internet or social media, and the third place (n=10, 17.5% each) shared elementary/high schools and faculties. More than half of them (n=33, 57.9%) think the HPV vaccine is effective,

and even more of them (n=39, 68.4%) know someone who is vaccinated, but only less than a quarter of respondents (n=13, 22.8%) have been vaccinated. Opinions were divided on where HPV vaccination should be administered. They could choose more than one option – most of the students voted for high schools (n=49, 34.8%), then for faculties (n=30, 21.3%), and the third place was shared by elementary schools and healthcare facilities (n=25, 17.7% each).

Almost half of the respondents (n=26, 45.6%) declared that they would get vaccinated with the HPV vaccine, while a small number (n=10, 17.5%) would take it if vaccination were free. Numbers are even higher when it comes to vaccination of their own children (n=30, 52.6%) and recommending the vaccine to people in their surroundings (n=41, 71.9%). Most of them (n=39, 68.4%) agreed that they could benefit from more information and education related to HPV and HPV vaccines, suggesting that education should be provided primarily in high schools (n=44, 22.3%), on social networks (n=41, 20.8%), and in faculties (n=39, 19.8%). It's not negligible the number of those who thought of preschools/elementary schools (n=23, 11.7%) and television (n=22, 11.2%) as ways to educate the population. The best age category, according to our population of respondents, to start education was high school (n=35, 61.4%) and grades 5-8 of elementary school (n=17, 29.8%). We found it relevant to compare attitudes about vaccination in general with those about HPV vaccination, and we found out that the three thirds of participants (n=43, 75.4%) consider vaccination in general effective.

In order to see which factors mainly affect knowledge and attitudes, Tables 3 and 4 are presented, showing if there was a specific bond between gender or study year with some of the responses. Correlation of these parameters between male and female students in Table 3, and between 3rd-year and graduate students in Table 4, has shown no statistically significant difference. In comparison by year of study, the closest to significance was the question regarding vaccinating children ($p \approx 0.06$), while the comparison by gender showed that there was a trend toward higher vaccination rates among females ($p \approx 0.08$).

Table 3. Differences between male and female students

	Male	Female	*p*
Did you know that HPV causes genital warts (condyloma) in both males and females:			
Yes	17 (94.4%)	32 (82.1%)	$p \approx 0.25$
No	1 (5.6%)	7 (17.9%)	
Did you know that HPV causes a large number of cancers (vulval, vaginal, penis, anal, mouth, and throat cancer) and it`s the leading cause of cervical carcinoma in females:			
Yes	16 (88.9%)	39 (100%)	$p \approx 0.50$
No	2 (11.1%)	/	
Have you been vaccinated with the HPV vaccine:			
Yes	1 (5.6%)	12 (30.8%)	$\mathbf{p \approx 0.08}$
No	17 (94.4%)	27 (69.2%)	
Do you consider HPV vaccine as effective:			
Yes	12 (66.7%)	21 (53.8%)	
No	/	1 (2.6%)	$p \approx 0.40$
Maybe	6 (33.3%)	17 (43.6%)	
When do you think is the best time for getting vaccinated with HPV vaccine:			
Before having first sexual intercourse	16 (88.9%)	32 (82.1%)	
Anytime in a lifetime	/	3 (7.7%)	$p \approx 0.50$
I don`t know	2 (11.1%)	4 (10.3%)	
Would you get vaccinated with HPV vaccine:			
Yes	5 (27.8%)	22 (56.4%)	
Yes, if the vaccine is free	3 (16.7%)	7 (17.9%)	$p \approx 0.20$
No	3 (16.7%)	2 (5.1%)	
Maybe	7 (38.9%)	8 (20.5%)	
Would you get your kids vaccinated with HPV vaccine:			
Yes	7 (38.9%)	23 (59%)	
Yes, if the vaccine is free	/	3 (7.7%)	$p \approx 0.15$
No	1 (5.6%)	2 (5.1%)	
Maybe	10 (55.6%)	11 (28.2%)	
Would you recommend HPV vaccine to people in your surroundings:			
Yes	12 (66.7%)	29 (74.4%)	
No	/	2 (5.1%)	$p \approx 0.30$
Maybe	6 (33.3%)	8 (20.5%)	
Do you consider it necessary to have more information and education related to HPV and HPV vaccines:			
Yes	14 (77.8%)	25 (64.1%)	$p \approx 0.40$
No	4 (22.2%)	14 (35.9%)	
Do you consider vaccination in general as effective:			
Yes	13 (72.2%)	30 (76.9%)	
No	/	1 (2.6%)	$p \approx 0.30$
I don`t know, I need more information	5 (27.8%)	8 (20.5%)	

$p<0.05$

Table 4. Differences between 3rd-year and graduate students

	3rd year	Graduate students	*p*
Did you know that HPV causes genital warts (condyloma) in both males and females:			
Yes	11 (73.3%)	12 (92.3%)	$p \approx 0.14$
No	4 (26.7%)	1 (7.7%)	
Did you know that HPV causes a large number of cancers (vulval, vaginal, penis, anal, mouth, and throat cancer) and it`s the leading cause of cervical carcinoma in females:			
Yes	15 (100%)	13 (100%)	/
No	/	/	
Have you been vaccinated with the HPV vaccine:			
Yes	3 (20%)	2 (15.4%)	$p \approx 0.80$
No	12 (80%)	11 (84.6%)	
Do you consider the HPV vaccine as effective:			
Yes	7 (46.7%)	7 (53.8%)	
No	/	1 (7.7%)	$p \approx 0.60$
Maybe	8 (53.3%)	5 (38.5%)	
When do you think is the best time for getting vaccinated with HPV vaccine:			
Before having first sexual intercourse	12 (80%)	12 (92.3%)	
Anytime in a lifetime	/	1 (7.7%)	$p \approx 0.30$
I don`t know	3 (20%)	/	
Would you get vaccinated with HPV vaccine:			
Yes	7 (46.7%)	6 (46.2%)	
Yes, if the vaccine is free	2 (13.3%)	/	$p \approx 0.70$
No	1 (6.7%)	1 (7.7%)	
Maybe	5 (33.3%)	6 (46.2%)	
Would you get your kids vaccinated with HPV vaccine:			
Yes	7 (46.7%)	5 (38.5%)	
Yes, if the vaccine is free	1 (6.7%)	/	$\mathbf{p \approx 0.06}$
No	6 (40%)	1 (7.7%)	
Maybe	1 (6.7%)	7 (53.8%)	
Would you recommend HPV vaccine to people in your surroundings:			
Yes	8 (53.3%)	8 (61.5%)	
No	1 (6.7%)	1 (7.7%)	$p \approx 0.90$
Maybe	6 (40%)	4 (30.8%)	
Do you consider it necessary to have more information and education related to HPV and HPV vaccines:			
Yes	11 (73.3%)	10 (76.9%)	$p \approx 0.80$
No	4 (26.7%)	3 (23.1%)	
Do you consider vaccination in general as effective:			
Yes	8 (53.3%)	11 (84.6%)	
No	/	1 (7.7%)	$p \approx 0.10$
I don`t know, I need more information	7 (46.7%)	1 (7.7%)	

$p < 0.05$

DISCUSSION

Sexual intercourse is the most common way of HPV transmission, so the relation between getting the vaccine and the moment of first sexual intercourse can significantly determine whether the disease will develop or not. Vaccine protection rates are high if they are used before the first sexual intercourse, because they cannot treat pre-existing HPV infection (6). That`s why we hoped that this questionnaire would have an educational and suggestive effect, besides its questionable nature, especially after findings that 21.1% of our respondents' haven`t had sexual intercourse yet, and that 68.4% of our respondents were female. Other than this, the number of sexual partners can amplify the negative influence of HPV itself. The

normal vaginal microbiome has a protective role in disease prevention as long as there is no disruption of its balance. Sexual intercourse with multiple different people disrupts vaginal microecology and potentially helps develop the environment for HPV infection, cervical intraepithelial neoplasia, or even cervical cancer (7). Positively, participants of our study mostly declared that they have had 1-2 sexual partners (n=26, 45.6%), and there was an even number of those who haven`t had sexual intercourse yet and those who had 3-5 sexual partners through their lifetime (n = 12, 21.2%).

One of the main goals of this research was to determine how aware the dentistry students were of the long-term consequences of HPV infection, and how much information was given to them through their previous education. We wanted them to self-estimate their knowledge and whether or not they need more knowledge and information related to this subject. Half of our respondents (n=29, 50.9%) responded that they have enough knowledge, but there was a significant number of those who declared not having enough information (n=13, 22.8%), similar to a study done among dental students at the University of Las Vegas, where 25.6% students declared the same thing (8). Aside from that, praiseworthy was the information that 86% (n=49) knew that HPV causes genital warts, and the vast majority (n=55, 96.5%) knew about the carcinogenic potential of HPV.

Satisfactory, all study participants have heard of HPV and the HPV vaccine, which is a higher result than in some other studies (9, 10). This is encouraging because future dentists, together with doctors and nurses, should be among the leaders and advocates of HPV vaccination and vaccination in general (11). Most of them (n=31, 54.4%) had their first information on HPV in their elementary and high schools, but had listed internet/social media (n=17, 29.8%) and faculties (n=17, 29.8%) as their main source of information related to HPV. Similar to ours, a study done among oral health students in the USA has shown the internet as a second-placed source of information on HPV, but, differently, the first-placed source was the dental curriculum (12). Speaking of information sharing, we are aware that the internet and social media are not negligible sources for information spreading and education, so it could be a powerful tool if used for proper purposes (13). Given the influence that the internet and social media have on youth and their reliance on information they find there, it is necessary to make as much medically accurate data as possible readily available to those who investigate this subject (14). Similarly, when it comes to our question about the first-time hearing about the vaccine against HPV-related diseases, the second listed source was the internet/social media

(n=12, 21.1%), which contributes to the previous assertion. As expected, the first place was doctor/healthcare facility (n=17, 29.9%), and the third place was shared by elementary/high school (n=10, 17.5%) and faculty (n=10, 17.5%). As well, we asked students what, in their opinion, would be the best way to educate people about HPV and HPV vaccines, and we gave them the possibility to choose more than one answer. Social networks were again in second place (n=41, 20.8%), meaning that 41 student chose it with or without other answers. In other words, almost three-quarters of all participants (n=41, 71.9%) consider the internet and social media as a possibly important educational tool.

As a result of knowledge and attitudes, we examined the HPV vaccination rate. Approximately one-quarter of all students were vaccinated (n=13, 22.8%), which was similar to a study done among Saudi Arab dental students (15), higher than Romanian dental students (16), but almost twice lower than the HPV vaccination rate among Las Vegas dental students and postgraduate residents (8). This cognition was surprising if we take into account that only 1 student (1.8%) considered HPV vaccination and vaccination in general as ineffective, while others thought that HPV vaccination is effective (n=33, 57.9%) and maybe effective (n=23, 40.3%). Close ($p \approx 0.08$), but not statistically significant, was the fact that there was a six-times larger percentage of females vaccinated with the HPV vaccine, although a slightly bigger number of males considered it effective, which was confirmed by some other researches (17, 18). When it comes to vaccination in general, we got even better results, with three-quarters of participants (n=43, 75.4%) answering positively, and less than one-quarter reporting that they need more information. All the “maybe” answers and the need for more information lead us to a conclusion that there is a space for more education on vaccines, and an ongoing need for vaccination positive advertisement. Participants of our study mostly (n=39, 68.4%) confirmed the need for more information and education related to HPV and HPV vaccines, almost at the same number as dental professionals in Iowa, USA (19). Also, the number of those who believe in vaccination in general (75.4%) suggests that they are willing to take any vaccine they believe in, so the current focus should be on presenting all the positive and protective effects of the HPV vaccine. As a matter of fact, when we asked about their willingness to take the HPV vaccine, we received a surprisingly positive response. Almost half of the respondents (n=26, 45.6%) confirmed that they are ready to take the HPV vaccine, a further 10 (17.5%) of them declared that they would take the vaccine if it were free, and 16 (28.1%) were unsure. If we put aside the fact that there were only 5 (8.8%) students who were explicit about not getting

the vaccine, with the proper education, presentation, and funding, it means that we could possibly get a student population of 91.2% persons willing to get vaccinated.

According to the majority of our respondents (n=48, 84.2%), the best time for receiving the HPV vaccine is before the first sexual intercourse. Some research on the high school population in our country revealed that the average age for first sexual intercourse was 15.7 years for boys and 16.5 years for girls (20). One more study done in Serbia also got similar results, the average age of first sexual intercourse among boys was 16.7 years, while among girls it was 17.86 years. The same study revealed that at the age of 15 about 16.5% of the subjects had their first sexual experience, at the age of 16 about 34%, and up to the age of 18 approximately 52.5% of participants gained their first sexual experience (21). These results suggest that it would be ideal to start HPV and HPV vaccine education before the age of 15, which, in Serbia, mostly relates to the end of elementary and the beginning of high school. Our respondents had a similar opinion about the start of HPV and HPV vaccine education, where 35 (61.4%) suggested high school-age and 17 (29.8%) suggested grades 5-8 of elementary school age, as a starting point for education on this subject.

Regarding the children's vaccination, approximately half of the respondents (n=30, 52.6%) declared that they were willing to vaccinate their children, which is similar to the rate of children in Portland who completed all of the HPV vaccination series (22), but lower than the rate of parents willing to vaccinate their children in some other studies (23, 24). It`s important to mention that a higher rate of female respondents is willing to vaccinate their future children, than the rate found among the males. The closest to statistical significance ($p \approx 0.06$) was the comparison between the answers of 3rd year and graduate students at this exact question, suggesting that larger sample sizes may reveal meaningful differences. Additionally, encouraging was the fact that there was 5.3% of respondents who were willing to vaccinate children if the vaccine was free, and more than a third (n=21, 36.8%) of those who would consider it. Together with 71.9% positive and 24.6% with „maybe“ responses for willingness to recommend the HPV vaccine to the people in their surroundings, we consider that there is a good foundation among dentistry students for further work, and the development of HPV vaccine awareness.

CONCLUSION

Dental students are the future health promoters, along with medicine and nursing students. It means that, starting from their schooling to graduation and postgraduate work, people will consult them and look up to them as role models when it comes to certain medical decisions. We can conclude that they are a meaningful starting point in population education related to vaccination in general and HPV vaccination. According to them, the best time for starting HPV and HPV vaccine-related education is at a later age of elementary (grades 5-8) and at an early age of high school. Besides standard educational tools, the internet and social media should be used as well, given their impact on children and adolescents. In addition, it should be considered introducing more vaccine- and HPV vaccine-related education on faculties whose students are future healthcare providers, so they can gain more knowledge and transfer it further. Proper promotion and education, the right starting time, and greater availability combined could hopefully help the HPV vaccination rate increase, as well as the reduction of the appearance of genital warts, precancerous lesions and cancers related to HPV infection.

STUDY LIMITATIONS

Limitations of our study were the small sample of dental students, as well as the fact that this type of research can be a subjective vision of an individual included.

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