ORIGINALNI RAD

UDK BROJEVI:
618.1:[616.988:578.827(497.11)"2019"
615.371-057.875(497.11)"2019"
DOI: https://www.doi.org/10.5937/zdravzast51-41675

ZNANJE, STAVOVI I PONAŠANJE STUDENATA VISOKE ZDRAVSTVENE ŠKOLE U BEOGRADU O ZNAČAJU HPV INFEKCIJE, HPV VAKCINE I DRUGIH PREVENTIVNIH MERA

Marijana Dabić [1*]

[1] Akademija strukovnih studija Beograd, Odsek Visoka zdravstvena škola, Beograd, Republika Srbija

[*] Korespondencija: Marijana Dabić, Akademija strukovnih studija, Odsek Visoka zdravstvena škola, Katedra za zdravstvenu negu, Cara Dušana 254, 11080 Beograd, Republika Srbija; e-mail: dabicmarijana26@gmail.com

SAŽETAK

Uvod/Cilj: Znanje i informisanost o važnosti HPV vakcine protiv humanog papiloma virusa (HPV) u velikoj meri mogu doprineti redukciji obolevanja od raka grlića materice i drugih malignih tumora. Cilj ove studije je da se procene znanje, stavovi i ponašanja studenata o HPV infekciji i vakcini, kao i da se predlože mere za bolji obuhvat mladih HPV vakcinom.
Metode: Studijom preseka obuhvaćeno je 449 studenta zdravstene nege Visoke zdravstvene škole u Beogradu u periodu mart/maj 2019. godine. Upitnikom su prikupljeni podaci. U statističkoj analizi podataka korišćen je hi kvadrat test i Fišerov egzakni test.
Rezultati: Prosečna starost studenata iznosila je 21,02 ± 2,59 godine. Svoje znanje o HPV vakcini 86,0% studenata je ocenilo kao zadovoljavajuće. Na znanje o HPV vakcini u najvećem procentu su uticali nastavnici (79,7%), a zatim elektronski mediji (10,7%). Medicinske platforme za informisanje o HPV vakcini koristilo je samo 9% studenata. Prve informacije i određen stepen znanja o HPV infekciji i HPV vakcini studenti su usvojili u srednjoj školi (80,4% i 65,6%). Samo 3,4% studenata smatra da su mladi u Srbiji dovoljno informisani o HPV infekciji, a 0,4% o HPV vakcini. Svaki drugi student smatra da je jedan od načina za bolju informisanost mladih vršnjačka edukacija u školama. Oko 94% studenata zna da u našoj zemlji postoji organizovani skrining za rak grlića materice. Samo 10,2% studenata je želelo da vakciniše svoje dete HPV vakcinom, a oni koji to ne bi učinili kao glavni argument navode nedovoljnu informisanost o bezbednosti i efikasnosti vakcine (81,6%). Osobe koje su bile za HPV vakcinu su se značajno ređe podvrgavale redovnim ginekološkim pregledima.
Zaključak: Studenti Visoke zdravstvene škole u Beogradu smatraju da treba da postoji bolja edukacija o HPV infekciji i vakcini, što bi najbolje moglo da se realizuje sprovođenjem vršnjačke edukacije.

Ključne reči: HPV vakcina, studenti, znanje, stavovi

Uvod

Infekcija humanim papiloma virusima (HPV) je jedna od najčešćih polno prenosivih infekcija (1). Smatra se da skoro svi seksualno aktivni muškarci i žene u nekom trenutku svog života mogu da budu zaraženi nekim od preko 200 tipova humanog papiloma virusa (HPV)(2). Podaci Svetske zdravstvene organizacije (SZO) ukazuju da mladi uzrasta do 24 godine čine oko 60% ukupno obolelih od polno prenosivih infekcija (3). Rano stupanje u seksualne odnose uz nedovoljno znanja o polno prenosivim infekcijama, kontracepciji i planiranju porodice, kao i o značaju vakcine u prevenciji HPV infekcije i virusnog hepatitisa B, doprinose evidentnom narušavanju reproduktivnog zdravlja.

Imajući u vidu ozbiljne posledice hronične HPV infekcije među kojima je i pojava raka grlića materice, vulve, vagine, penisa, orofarinksa i anusa, HPV vakcina predstavlja sigurnu i efikasnu javno-zdravstvenu meru u prevenciji ove infekcije (4). Kao poseban značaj primene ove vakcine ogleda se i u redukciji javljanja genitalnih kondiloma (čak u 90% slučajeva). Vakcinacija takođe doprinosi smanjenju zdravstvenih troškova lečenja i postizanju ekonomske isplativosti u sistemu zdravstvene zaštite (5). Do 2018. na globalnom nivou 84 države (42% zemalja članica Ujedinjenih nacija) su u svoje nacionalne programe imunizacije uvele vakcinaciju protiv HPV-a (uključujući i 33 zemlje u Evropskom regionu

ORIGINAL ARTICLE

UDK NUMBERS:
618.1:[616.988:578.827(497.11)"2019"
615.371-057.875(497.11)"2019"
DOI: https://www.doi.org/10.5937/zdravzast51-41675

KNOWLEDGE, ATTITUDES AND BEHAVIOR OF STUDENTS OF THE MEDICAL COLLEGE OF APPLIED SCIENCES IN BELGRADE RELATED TO THE SIGNIFICANCE OF HPV INFECTION, THE HPV VACCINE AND OTHER PREVENTIVE MEASURES

Marijana Dabic[1*]

[1] Medical College of Applied Sciences, Department of Health Care, Belgrade, Republic of Serbia

[*] Correspondence: Marijana Dabic, Medical College of Applied Sciences, Department of Health Care, Cara Dusana 254, 11080 Belgrade, Republic of Serbia; e-mail: dabicmarijana6@gmail.com

SUMMARY

Introduction/Aim: Knowledge and awareness of the importance of the HPV vaccine against human papillomavirus (HPV) can greatly contribute to the reduction of cervical cancer and other malignant tumors. The aim of this study is to assess the knowledge, attitudes and behavior of students about HPV infection, as well as to propose measures for the better coverage of young people with the HPV vaccine.
Methods: A cross-sectional study included 449 students of healthcare of the Medical College of Applied Sciences in Belgrade in the period from March to May, 2019. Data were collected using a questionnaire. Chi-square test and Fisher's exact tests were used for the statistical analysis of data.
Results: The average age of students was 21.02 ± 2.59 years. 86.0% of students assessed their knowledge about the HPV vaccine as satisfactory. Teachers had the greatest influence on their knowledge about the HPV vaccine (79.7%), followed by the electronic media (10.7%). Medical platforms for information about the HPV vaccine were used by only 9% of students. Students acquired the first information and a certain degree of knowledge about HPV infection and the HPV vaccine in high school (80.4% and 65.6%). Only 3.4% of students think that young people in Serbia are sufficiently informed about HPV infection and 0.4% about the HPV vaccine. Every second student believes that peer education in schools is one of the ways to better inform young people. About 94% of students know that there is an organized screening for cervical cancer in our country. Only 10.2% of students wanted to vaccinate their child with the HPV vaccine, and those who would not do so cite the insufficient information about the safety and effectiveness of the vaccine as their main argument (81.6%). Respondents who were for the HPV vaccine significantly less frequently underwent regular gynecological examinations.
Conclusion: Students of the Medical College of Applied Sciences in Belgrade believe that there should be better education about HPV infection and the vaccine, which could be best realized by conducting peer education.

Keywords: HPV vaccine, students, knowledge, attitudes

Introduction

Human papillomavirus (HPV) infection is one of the most common sexually transmitted infections (1). It is believed that almost all sexually active men and women may, at some point in their lives, get infected with one of more than 200 types of human papillomavirus (HPV) (2). Data of the World Health Organization (WHO) indicate that young people under the age of 24 make up about 60% of all cases of sexually transmitted diseases (3). Early sexual intercourse with insufficient knowledge about sexually transmitted infections, contraception and family planning, as well as the significance of the vaccine and the prevention of HPV infection and viral hepatitis B contribute to the evident impairment of reproductive health.

Having in mind the serious consequences of chronic HPV infection, including the cancer of cervix, vulva, vagina, penis, oropharynx and anus, the HPV vaccine represents a safe and effective public health measure in the prevention of this infection (4). The special significance of this vaccine is reflected in the reduction of occurrence of genital warts (in up to 90% of cases). Vaccination also contributes to the reduction in the cost of

od ukupno 44 zemlje) (4). U zemljama sa visokim obuhvatom HPV vakcinom uočena je smanjena učestalost patoloških promena na grliću materice. Tako je studija Lei i saradnika pokazala da je praćenjem 1.672.983 devojčica i žena starosti od 10 do 30 godina od 2006. do 2017 u Švedskoj došlo do redukcije kumulativne incidencije raka grlića materice među vakcinisanim kvadrivalentnom HPV vakcinom (47 obolelih na 100.000 ispitanika) u odnosu na nevakcinisane (94 na 100.000 ispitanika) (6).

Cilj naše studije je da se procene znanje, stavovi i ponašanje studenata zdravstvene nege Visoke zdravstvene škole u Beogradu o HPV infekciji i vakcini, kao i da se predlože mere za bolji obuhvat mladih HPV vakcinom.

Metode

Istraživanje je dizajnirano kao studija preseka koja je sprovedena u periodu od marta do maja 2019. godine u Visokoj zdravstvenoj školi u Beogradu. U studiju je uključeno 449 studenata sve tri godine osnovnih strukovnih studija koji su dobrovoljno prihvatili anonimno učešće u studiji. Od svih ispitanika prikupljeni su podaci upitnikom. Na osnovu pregleda literature i prethodnih istraživanja u ovoj oblasti, konstruisan je upitnik koji se sastojao iz 3 dela sa 30 pitanja (otvorenog i zatvorenog tipa).

Prvi deo upitnika odnosio se na demografske karakteristike (uzrast, pol, mesto stanovanja, zaposlenost, godina studija, prethodno završena škola, studijski program), a drugi na znanje i stavove o HPV infekciji i HPV vakcini. Trećim delom upitnika obuhvaćeno je ponašanje ispitanika (pušenje, konzumiranje alkohola, korišćenje psihoaktivnih supstanci, seksualno ponašanje, korišćenje kontracepcije, odlazak na ginekološke preglede, učešće u Papanikolau skrining programu za rano otkrivanje karcinoma grlića materice, vakcinalni status po pitanju HPV).

U deskriptivnoj analizi podataka korišćeni su apsolutni brojevi, procenti i aritmetičke sredine sa standardnom devijacijom. Za pripremu baze podataka, kao i za statističku obradu, korišćen je softverski paket programa Statistical Package for the Social Science, SPSS 20.0 (SPSS Inc., Chicago, IL, USA). U statističkoj analizi podataka korišćen je hi kvadrat test i Fisherov egzaktni test.

Rezultati

Ovom studijom preseka (engl. *cross-sectional study*) obuhvaćeno je 449 studenta zdravstvene nege Visoke zdravstvene škole u Beogradu (5,3% muškaraca i 94,7% žena), uzrasta od 18 do 38 godina (tabela 1). Prosečna starost svih studenata iznosila je 21,02 godine (SD=2,59). Skoro ⅔ je bilo iz Beograda, a 87,8% je bilo zaposleno. Najveći broj studenata je bio sa prve (42,8%), a zatim sa druge (30,5%) i treće godine studija (26,7%). Među studentima zdravstvene nege, najviše je bilo studenata sa odseka Strukovna medicinska sestra (57,9%), a zatim Strukovna medicinska sestra – babica (33,2%) i Strukovna medicinska sestra – vaspitač (8,9%). Većina studenata (95,1%) je imala završenu srednju medicinsku školu.

Svoje znanje o HPV vakcini 86,0% studenata je ocenilo kao zadovoljavajuće (tabela 2). Na znanje o HPV vakcini u najvećem procentu su uticali nastavnici (79,7%), a zatim elektronski mediji (10,7%). Medicinske platforme za informisanje o HPV vakcini koristilo je 9% studenata. Prve informacije i određen stepen znanja o HPV infekciji i HPV vakcini studenti su usvojili u srednjoj školi (80,4% i 65,6%). Samo 3,4% studenata smatra da su mladi u Srbiji dovoljno informisani o HPV infekciji, a 0,4% o HPV vakcini. Svaki drugi student smatra da je jedan od načina za bolju informisanost mladih vršnjačka edukacija u školama. Oko 94% studenata zna da u našoj zemlji postoji organizovani skrining za rak grlića materice. Oko 10% studenata ima stav da bi vakcinisali svoje dete HPV vakcinom, a oni koji to ne bi učinili kao glavni argument navode nedovoljnu informisanost o bezbednosti i efikasnosti vakcine (81,6%).

Ponašanje ispitanika pokazuju da ¼ studenata svakodnevno puši, oko 50% povremno ili svakodnevno konzumira alkohol i 1,1% povremeno ili svakodnevno upotrebljava psihoaktivne supstance (tabela 3). Seksualni odnos je imalo 78,3% ispitanika, a kondom koristi skoro pri svakom seksualnom odnosu 77,2% studenata. Prosečna starost pri prvom seksualnom odnosu je bila 18,03 godina (SD=1,41), a prosečan broj partnera je bio 2,21 (SD=2,14). Kontracepciju je koristilo 85,1% studenata koji upražnjavaju seksualne odnose (78,3%) i najčešće korišćeni metod kontracepcije je prezervativ (91,8%). Na redovne ginekološke pregleda odlazi 75,8% ispitanica. Na skriningu karcinoma grlića materica u Srbiji je učestvovalo 30,6% stu-

treatment and the achievement of economic profitability in the healthcare system (5). By 2018, at the global level, 84 countries (42% of the United Nations member states) had introduced HPV vaccination into their national immunization programs (including 33 of 44 countries in the European region) (4). A decrease in the frequency of pathological changes of the cervix was observed in the countries with the high HPV vaccination coverage. Thus, the study of Lei and associates showed that by following up 1,672,983 girls and women aged between 10 and 30 from 2006 to 2017 in Sweden, there came to a reduction in the cumulative incidence of cervical cancer among those vaccinated with the quadrivalent HPV vaccine (47 cases per 100,000 respondents) in comparison to the unvaccinated (94 per 100,000 respondents) (6).

The aim of our study is to assess the knowledge, attitudes and behavior of healthcare students of the Medical College of Applied Sciences in Belgrade about the HPV infection and vaccine, as well as to propose measures for the better coverage of young people with the HPV vaccine.

Methods

The research was designed as a cross-sectional study which was conducted at the Medical College of Applied Sciences in the period from March to May 2019. The study included 449 students of all three years of professional studies who voluntarily accepted the anonymous participation in the study. Data were collected from all respondents with the help of a questionnaire. The questionnaire was designed based on the literature review and previous research in this field, and it consisted of 3 parts with 30 questions (open and closed questions).

The first part of the questionnaire was related to demographic characteristics (age, gender, place of residence, employment, year of studies, previously completed school, study program), while the second part was related to the knowledge and attitudes about HPV infection and HPV vaccine. The third part of the questionnaire covered the behavior of respondents (smoking, alcohol consumption, use of psychoactive substances, sexual behavior, use of contraception, going to gynecological examinations, participation in the Papanicolaou screening program for the early detection of cervical cancer, HPV vaccination status).

Absolute numbers, percentages and arithmetic mean with standard deviation were used for the descriptive data analysis. The Statistical Package for the Social Science, SPSS 20.0 (SPSS Inc, Chicago, IL, USA) was used for the preparation of the database, as well as for the statistical analysis. Chi-square test and Fisher's exact test were used for the statistical analysis of data.

Results

This cross-sectional study included 449 healthcare students of the Medical College of Applied Sciences in Belgrade (5.3% of men and 94.7% of women) aged 18 to 38 (Table 1). The average age of all students was 21.02 years (SD=2.59). Almost two-thirds were from Belgrade, while 87.8% were employed. The largest number of students was first year students (42.8%), followed by the second year students (30.5%) and third year students (26.7%). Among healthcare students, the majority was from the vocational nurse department (57.9%), followed by vocational nurse – midwife (33.2%) and vocational nurse – pre-school teacher (8.9%). The majority of students (95.1%) had completed secondary medical school.

86.0% of students assessed their knowledge about the HPV vaccine as satisfactory (Table 2). Teachers (79.7%) had the greatest influence on knowledge about the HPV vaccine, followed by the electronic media (10.7%). Medical platforms for the information about the HPV vaccine were used by 9% of students. Students acquired the first information and a certain degree of knowledge about the HPV infection and vaccine in high school (80.4% and 65.6%). Only 3.4% of students believe that young people in Serbia are sufficiently informed about HPV infection, and 0.4% about the HPV vaccine. Every second student believes that peer education in schools is one of the ways to better inform young people. About 94% of students know that there is an organized screening for cervical cancer in our country. About 10% of students think that they would vaccinate their child with the HPV vaccine, while those who would not do so state insufficient information about the safety and effectiveness of the vaccine as the main argument (81.6).

Tabela 1. Demografske karakteristike studenata Visoke zdravstvene škole

Karakteristike	Broj (%) N=449
Pol	
Muški	4 (5,3)
Ženski	425 (94,7)
Uzrast (godine) (x̄ ± SD):	21,02 ± 2,59
Mesto stanovanja:	
Beograd	264 (58,9)
Cenralna Srbija	72 (16,1)
Vojvodina	112 (25,0)
Godina studija	
Prva	192 (42,8)
Druga	137 (30,5)
Treća	120 (26,7)
Prethodno završena škola	
Medicinska škola	427 (95,1)
Gimnazija	19 (4,2)
Drugo	3 (0,7)
Studijski program	
Strukovna medicinska sestra	260 (57,9)
Strukovna medicinska sestra-babica	149 (33,2)
Strukovna medicinska sestra-vaspitač	40 (8,9)
Zaposlenost u oblasti zdravstvene struke	55 (12,2)

x̄ - aritmetička sredina; SD - standardna devijacija

dentkinja, koje su bile seksualno aktivne. U periodu izvođenja studije nijedan od ispitanika nije bio vakcinisan HPV vakcinom.

Osobe koje su bile za primenu HPV vakcine i one koje su bile protiv nisu se značajno razlikovale u odnosu na sledeće životne navike: svakodnevno pušenje cigareta, konzumiranje alkohola povremeno ili svakodnevno, seksualni odnos, korišćenje kondoma pri skoro svakom seksualnom odnosu i zadovoljavajućem znanju o HPV infekciji (tabela 4). Osobe koje su bile za HPV vakcinu su se značajno ($p < 0,001$) ređe podvrgavale redovnim ginekološkim pregledima.

Diskusija

Rezultati naše studije pokazuju da studenti Visoke zdravstvene škole u Beogradu ukazuju na deficit znanja i informisanosti mladih o HPV infekciji (3,4%) i vakcini (0,4%). Međutim, oko 10% studenata bi vakcinisalo svoje dete HPV vakcinom, ali ni jedan student nije dobio HPV vakcinu do početka sprovođenja ovog istraživanja. Protiv HPV vakcine, u poređenju sa studentima koji su bili za HPV vakcinu, bili su studenti koji su značajno češće išli na redovni ginekološki pregled. Protiv HPV vakcine bile su osobe koje su kao glavni razlog takvog stava navodile nedovoljno informacija o efikasnosti i bezbednosti vakcine.

U studiji koja je rađena među studentima Visoke medicinske škole u Ćupriji o humanom papiloma virusu i HPV vakcini, gde je korišćena provera znanja pre i posle edukacije o HPV infekciji i primeni HPV vakcine (7). Rezultati su pokazali nezadovoljavajući nivo znanja i pre i posle testa, naročito u oblasti prevencije HPV infekcije (7). Sagledavajući rezultate brojnih evropskih i svetskih istraživanja u populaciji studenata sestrinstva, medicine i drugih fakulteta, ali i među zaposlenim zdravstvenim radnicima, uočen je i deficit znanja o HPV vakcini, efektima primene, ali i nedovoljno primenjenih postojećih znanja o prevenciji HPV infekcije u praksi (8-13). Jedno od takvih istraživanja je sistemski pregled literature za period od 2006. do 2017. godine gde su sumirani rezultati o faktorima koji su povezani sa znanjem o HPV-u i prihvatanju vakcine kod adolescenata i njihovih roditelja u 16 evropskih država (14). Najviši nivo znanja o HPV infekciji i vakcini, pokazali su adolescenti u Španiji (93%), Belgiji (67%) i Italiji (61%), dok je najveća zainteresovanost za primenu vakcine bila kod adolescenata u Švedskoj (90,5%)

Table 1. Demographic characteristics of students of Medical College of Applied Sciences

Characteristics	Number (%) N=449
Gender	
Male	4 (5.3)
Female	425 (94.7)
Age (years) (x̄±SD)	21.02 ± 2.59
Place of residence	
Belgrade	264 (58.9)
Central Serbia	72 (16.1)
Vojvodina	112 (25.0)
Year of studies	
First	192 (42.8)
Second	137 (30.5)
Third	120 (26.7)
Previously finished school	
Medical School	427 (95.1)
High School	19 (4.2)
Other	3 (0.7)
Study program	
Vocational nurse	260 (57.9)
Vocational nurse - midwife	149 (33.2)
Vocational nurse – pre-school teacher	40 (8.9)
Employment in the field of healthcare	55 (12.2)

x̄ - arithmetic mean; SD – standard deviation

The respondents' behavior shows that one fourth of students smoke every day, about 50% consume alcohol occasionally or every day and 1.1% uses psychoactive substances occasionally or daily (Table 3). 78.3% of respondents had sexual intercourse, while 77.2% of students use condoms almost every time they have sex. The average age at first sexual intercourse was 18.03 years (SD=1.41), while the average number of partners was 2.21 (SD=2.14). Contraception was used by 85.1% of students who have sexual relations (78.3%), and the most frequently used method of contraception was a condom (91.8%). 75.8% of respondents go to regular gynecological examinations. 30.6% of students who had sexual intercourse participated in cervical cancer screening in Serbia. None of the respondents were vaccinated with the HPV vaccine at the time when this study was conducted.

There were no significant differences between persons who were for the application of the HPV vaccine and those who were against, regarding the following lifestyle habits: daily smoking of cigarettes, occasional or daily consumption of alcohol, sexual intercourse, use of condoms almost during each sexual intercourse, and satisfactory knowledge about the HPV infection (Table 4). Persons who were for the application of the HPV vaccine ($p < 0.001$) underwent regular gynecological examinations significantly less frequently.

Discussion

The results of our study show that the students of the Medical College in Belgrade indicate a deficit of knowledge and information among young people about HPV infection (3.4%) and the vaccine (0.4%). However, about 10% of students would vaccinate their child with the HPV vaccine, but none of the students had received the HPV vaccine by the time this study began. The students, who went to regular gynecological examinations significantly more often, were against the HPV vaccine in comparison to those students who were for the HPV vaccine. There were persons against the HPV vaccine who cited insufficient information about the effectiveness and safety of the vaccine as the main reasons for such an attitude.

In a study which was conducted among the students of the Medical College in Ćuprija about the human papillomavirus and the HPV vaccine, the assessment test was used to assess knowledge

Tabela 2. Znanje i stavovi studenata o HPV infekciji i vakcini

Karakteristike	Broj (%)
Zadovoljavajuće znanje o HPV infekciji (N=449)	386 (86,0)
Izvori informacija o HPV vakcini (N=449)	
Nastavnici	358 (79,7)
Roditelji	14 (3,1)
Prijatelji	14 (3,1)
Elektronski mediji (društvene mreže, web sajtovi)	48 (10,7)
Medijske kampanje (TV, štampa)	12 (2,7)
Nisam znao/la da postoj	3 (0,7)
Koristim medicinske platforme za dobijanje informacije o HPV vakcini (N=449)	40 (9,0)
Prvi put čula/čuo sam o HPV infekciji (N=449)	
U osnovnoj školi	55 (12,2)
U srednjoj školi	361 (80,4)
U toku studija	27 (6,0)
Nisam bio/la informisan/a	6 (1,3)
Prvi put čula/čuo sam o HPV vakcini (N=448)	
U osnovnoj školi	18 (4,0)
U srednjoj školi	294 (65,6)
U toku studija	115 (25,7)
Nisam bio/la informisan/a	21 (4,7)
Mladi u Srbiji su dovoljno informisani o HPV infekciji (N=449)	15 (3,4)
Mladi u Srbiji su dovoljno informisani o HPV vakcini (N=449)	2 (0,4)
Boljoj informisanosti o HPV vakcini može da doprinese (N=449)	
Vršnjačka edukacija u školama	240 (53,8)
Medijske kampanje	76 (17,0)
Preventivni pregledi	82 (18,4)
Učešće roditelja u edukaciji	42 (9,4)
Drugo	6 (1,3)
U našoj zemlji sprovodi se organizovani skrining program za rak grlića materice (N=449)	398 (93,9)
Vakcinisala bih svoje dete (N=441)	45 (10,2)
Argumenti protiv vakcinacije HPV vakcinom (N=396)*	
Visoka cena	56 (14,4)
Nedovoljna informisanost o bezbednosti i efikasnosti vakcine	323 (81,6)
Strah od igala	2 (0,5)
Seksualna inhibicija ili stigma promiskuiteta	12 (3,0)
Interesi farmaceutskih kompanija	28 (7,1)
Vakcine smatram štetnim u svakom smislu	3 (0,7)
Drugo (saglasnost roditelja, strah od bolesti)	4 (1,0)

* Bio je moguć izbor više ponuđenih odgovora

i na Islandu (90,9%). U studiji preseka rađenoj 2020. godine u Saudijskoj Arabiji među studentima medicinskih i nemedicinskih koledža, utvrđeno je da bi više od polovine studenata medicinskih nauka (60,5%) pristalo na imunizaciju HPV vakcinom, a znatno manje studenata drugih fakulteta. S obzirom da naša studija nije obuhvatila studente drugih fakulteta nemedicinskih fakulteta, bilo bi značajno u perspektivi uraditi i ovo istraživanje.

Podaci Svetske zdravstvene organizacije (SZO) ukazuju da mladi uzrasta do 24 godine života čine oko 60% ukupno obolelih od polno prenosivih infekcija i da su u 50% slučajeva nosioci HIV infekcije (4). U okviru našeg istraživanja prosečna starost stupanja u seksualne odnose kod studenata iznosi 18,03 ± 1,41 godina, dok među onima koji imaju seksualne odnose čak 11,5% njih uopšte ne koristi kontracepciju. U studiji preseka koja je rađena

Table 2. Knowledge and attitudes of students towards HPV infection and vaccine

Characteristics	Number (%)
Satisfactory knowledge about HPV infection (N=449)	386 (86.0)
Sources of information about the HPV vaccine (N=449)	
Teachers	358 (79.7)
Parents	14 (3.1)
Friends	14 (3.1)
Electronic media (social networks, websites)	48 (10.7)
Media campaigns (TV, press)	12 (2.7)
I did not know it exists	3 (0.7)
I use medical platforms for obtaining information about the HPV vaccine (N=449)	40 (9.0)
I heard about HPV infection for the first time (N=449)	
In elementary school	55 (12.2)
In secondary school	361 (80.4)
During studies	27 (6.0)
I was not informed	6 (1.3)
I heard about the HPV vaccine for the first time (N=448)	
In elementary school	18 (4.0)
In secondary school	294 (65.6)
During studies	115 (25.7)
I was not informed	21 (4.7)
Young people in Serbia are sufficiently informed about HPV infection (N=449)	15 (3.4)
Young people in Serbia are sufficiently informed about the HPV vaccine (N=449)	2 (0.4)
The following can contribute to better awareness of HPV vaccine (N=449)	
Peer education in schools	240 (53.8)
Media campaigns	76 (17.0)
Preventive examinations	82 (18.4)
Participation of parents in the education	42 (9.4)
Other	6 (1.3)
Organized screening for cervical cancer is conducted in our country (N=449)	398 (93.9)
I would vaccinate my child (N=441)	45 (10.2)
Arguments against the vaccination with the HPV vaccine (N=449)*	
High price	56 (14.4)
Insufficient information about the safety and effectiveness of the vaccine	323 (81.6)
Fear of needles	2 (0.5)
Sexual inhibition of the stigma of promiscuity	12 (3.0)
Interests of pharmaceutical companies	28 (7.1)
I think that vaccines are harmful in any sense	3 (0.7)
Other (parents' consent, fear of disease)	4 (1.0)

* multiple-choice answers were offered

before and after the education on HPV infection and the use of the HPV vaccine (7). The results showed an unsatisfactory level of knowledge both before and after the test, especially in the field of HPV infection prevention (7). Looking at the results of numerous European and world studies in the population of students of nursing, medicine and other faculties, as well as among employed health workers, a deficit of knowledge about the HPV vaccine, effects of its application was observed, as well as the insufficiently applied existing knowledge about the prevention of HPV infection in practice (8-13). One of such studies is a systematic review of the literature for the period from 2006 to 2017, where the results about factors that are associated with the knowledge on HPV and acceptance of the vaccine among adolescents and their parents in 16 European countries are summarized (14). The highest level of knowledge about HPV infection and the vaccine was shown by adolescents in

Tabela 3. Distribucija studenata u odnosu na ponašanje

Karakteristike	Broj (%) N=449
Pušenje cigareta (svakodnevno)	114 (25,6)
Konzumiranje alkohola (povremeno ili svakodnevno)	235 (48,2)
Korišćenje psihoaktivnih supstanci (povremeno ili svakodnevno)	5 (1,1)
Seksualni odnos	343 (78,3)
Uzrast pri stupanju u prvi sekusalni odnos (godine)(x̄±SD)	18,03 ± 1,41
Prosečan broj partnera (x̄±SD)	2,21 ± 2,14
Redovan ginekološki pregled studentkinja (N=343)	322 (75,8)
Korišćenje kontracepcije (studentkinje) (N=343)	292 (85,1)
Vrsta kontraceptiva (studentkinje koje sui male seksualni odnos) (N=292)	
Spirala	5 (1,7)
Prezervativ	268 (91,8)
Metod prekinutog snošaja	16 (5,5)
Kontraceptivne pilule	3 (1,0)
Podvrgnute Papanikolau skrining testu (studentkinje) (N=343)	130 (30,6)

x̄ - aritmetička sredina; SD - standardna devijacija

na teritoriji opštine Inđija i kojom je obuhvaćeno 490 adolescenata uzrasta 15-19 godina, uzrast pri stupanju u prvi seksualni odnos za adolescente je bio 16,33 godine dok je polno prenosivu infekciju imalo oko 2% devojčica i oko 5% mladića (15). U poređenju sa populacijom adolescenata u Brazilu na osnovu Nacionale ankete o zdravlju iz 2009. godine, utvrđeno je da adolescenti rano stupaju u seksualne odnose. Čak trećina mladih uzrasta 14 godina imala je prvi seksualni odnos u 12. godini života ili ranije što se povezuje sa nezaštićenim odnosima i većim brojem partnera tokom života (16).

Uvođenje novih vakcina na tržište i u nacionalne programe imunizacije predstavlja složen i delikatan postupak. Rezultati dosadašnjih istraživanja ukazuju na to da je zaštita koju pruža HPV vakcina dugotrajna i u toku su studije praćenja kako bi se ustanovilo koliko dugo traje imunitet (17-19). Postmarketinškim praćenjem neželjenih događaja utvrđeno je da je vakcina protiv HPV-a visoko bezbedna. Od 2006. godine, od kada se prvi put primenjuje pa do danas, nije registro-

Tabela 4. Životne navike studenata u odnosu na stav prema HPV vakcini

Karakteristike	Za primenu HPV vakcine (N=45) Broj (%)	Protiv primene HPV vakcine (N=396) Broj (%)	p vrednost*
Pušenje cigareta (svakodnevno)	10 (22,2)	104 (26,5)	0,539
Konzumiranje alkohola (povremeno ili svakodnevno)	22 (48,9)	207 (52,5)	0,642
Korišćenje psihoaktivnih supstanci (povremeno ili svakodnevno)	1 (2,2)	6 (1,5)	0,073
Seksualni odnos	34 (75,6)	306 (77,2)	0,951
Korišćenje kondoma pri skoro svakom seksualnom odnosu* **	23 (67,6)	242 (76,3)	0,108
Zadovoljavajuće znanje o HPV infekciji	42 (93,3)	338 (85,4)	0,142**
Redovni ginekološki pregledi (studentkinje)* **	5 (14,7)	300 (98,0)	< 0,001

* χ^2 test; ** *Fisher*-ov test; *** odnosi se samo na one koje su imali seksualni odnos.

Table 3. Distribution of students in relation to behavior

Characteristics	Number (%) N=449
Smoking (daily)	114 (25.6)
Alcohol consumption (occasionally or every day)	235 (48.2)
Use of psychoactive substances (occasionally or every day)	5 (1.1)
Sexual intercourse	343 (78.3)
Age at the time of the first sexual intercourse (years)($\bar{x}$ ± SD)	18.03 ± 1.41
Average number of partners ($\bar{x}$ ± SD)	2.21 ± 2.14
Regular gynecological examination of students (N=343)	322 (75.8)
Use of contraception (female students) (N=343)	292 (85.1)
Type of contraceptives (female students that had sexual relations) (N=292)	
Spiral	5 (1.7)
Preservative	268 (91.8)
Method of coitus interruptus	16 (5.5)
Contraceptive pills	3 (1.0)
Underwent Papanicolaou screening test (female students) (N=343)	130 (30.6)

$\bar{x}$ - arithmetic mean; SD – standard deviation

Spain (93%), Belgium (67%) and Italy (61%), while the greatest interest in the application of vaccine was observed among the adolescents in Sweden (90.5%) and Iceland (90.9%). In a cross-sectional study that was conducted in Saudi Arabia in 2020 among medical and non-medical college students, it was found that more than half of medical students (60.5%) would agree to immunization with the HPV vaccine, and significantly fewer students of other faculties. Given that our study did not include students from other faculties, non-medical faculties, it would be significant to do this research in the future as well.

Data of the World Health Organization (WHO) indicate that young people under the age of 24 make up about 60% of all cases of sexually transmitted infections and that in 50% of cases they are carriers of HIV infection (4). In our study, the average age of entering into sexual relations among students is 18.03 ± 1.41 years, while among those who have sexual relations, even 11.5% do not use contraception at all. In a cross-sectional study that

Table 4. Life habits of students in relation to the attitude towatds the HPV vaccine

Characteristics	For the administration of HPV vaccine (N=45) Number (%)	Against the administration of HPV vaccine (N=396) Number (%)	p value*
Smoking (daily)	10 (22.2)	104 (26.5)	0.539
Alcohol consumption(occasionally or every day)	22 (48.9)	207 (52.5)	0.642
Use of psychoactive substances (occasionally or every day)	1 (2.2)	6 (1.5)	0.073
Sexual intercourse	34 (75.6)	306 (77.2)	0.951
Use of condoms almost during each sexual intercourse ***	23 (67.6)	242 (76.3)	0.108
Satisfactory knowledge about HPV infection	42 (93.3)	338 (85.4)	0.142**
Regular gynecological examinations (female students) ***	5 (14.7)	300 (98.0)	< 0.001

* χ^2 test; **Fisher's test; ***only those who had sexual intercourse.

van nijedan slučaj teže neželjene reakcije u vezi sa prethodnom imunizacijom HPV vakcinom (20-22). U zemljama sa visokim obuhvatom HPV vakcinom, kao što je slučaj u Australiji, smanjena je učestalost patoloških promena na grliću materice a isto se očekuje kada je u pitanju i pojava karcinoma (23,24). SZO u svom izveštaju za 2022. godinu navodi da je u Evropskom regionu 38 od 53 zemlje, uključujući i Srbiju, uvelo HPV vakcinu do kraja 2021. godine. Sa ovim rezultatom, preko polovine zemalja sa srednjim prihodima u regionu sada ima pristup ovoj vakcini (25). U Srbiji se sprovodi aktivna preporučena imunizacija za oboljenja izazvana HPV-om i to za lica određenog uzrasta što je bliže određeno Pravilnikom o programu obavezne i preporučene imunizacije stanovništva protiv određenih zaraznih bolesti (26,27). Prema Stručnom metodološkom uputstvu Instituta za javno zdravlje Srbije, ova imunizacija se preporučuje kod dece starije od devet godina, pre prvih seksualnih odnosa, a prvenstveno deci šestih razreda osnovne škole u dve ili tri doze što zavisi od uzrasta i vrste vakcine (28).

Naša studija preseka ima nekoliko ograničenja koje se odnose na samu vrstu studije, subjektivnu samoprocenu znanja studenata koja se različito može interpretirati i uticati na kvalitet odgovora, kao i mogućnost dobijanja socijalno poželjnih odgovora kada je reč o životnim stilovima i navikama. Prednosti ove studije predstavljene su u reprezentativnosti i veličini uzorka.

Zaključak

Edukacija mladih o putevima prenošenja HPV infekcije i mogućnostima prevencije (sa akcentom na HPV vakcinu) je prioritet. Potreban je multidisciplinarni pristup i uključivanje relevantnih društvenih, zdravstvenih i obrazovnih institucija koje bi, svojim dobro isplaniranim i organizovanim akcijama, kontinuirano radile na unapređivanju reproduktivnog zdravlja. Samim tim bi se ukazao javnozdravstveni značaj ovog problema i proširio prostor za podizanje nivoa znanja o značaju imunizacije HPV vakcinom u bližoj budućnosti.

Konflikt interesa

Autor je izjavio da nema konflikta interesa.

Literatura

1. Rowley J, Vander Hoorn S, Korenromp E, Low N, Unemo M, Abu-Raddad LJ, et al. Global and Regional Estimates of the Prevalence and Incidence of Four Curable Sexually Transmitted Infections in 2016 Based on Systematic Review and Global Reporting. WHO Bulletin 2019;10(12): e0143304.
2. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2018;68(6):394-424. doi: 10.3322/caac.21492
3. Bray F, Soerjomataram I. The Changing Global Burden of Cancer: Transitions in Human Development and Implications for Cancer Prevention and Control. In: Gelband H, Jha P, Sankaranarayanan R, Horton S, editors. Cancer: Disease Control Priorities. Third Edition (Volume 3). Washington (DC): The International Bank for Reconstruction and Development/ The World Bank; 2015. pp.23-44.
4. WHO. Cancer prevention and control in the context of an integrated approach: report by the Secretariat. Geneva: World Health Organization, 2016.
5. Bruni L, Diaz M, Barrionuevo-Rosas L, Herrero R, Bray F, Bosch FX, et al. Global estimates of human papillomavirus vaccination coverage by region and income level: a pooled analysis. Lancet Glob Health 2016; 4(7): e453-63. doi: 10.1016/S2214-109X(16)30099-7
6. Lei J, Ploner A, Elfström KM, Wang J, Roth A, Fang F, Sundström K, Dillner J, Sparén P. HPV Vaccination and the Risk of Invasive Cervical Cancer. N Engl J Med 2020; 383(14):1340-1348. doi: 10.1056/NEJMoa1917338.
7. Antic LJ, Antic D, Aleksopulos H, Despotovic M, Zlatanovic M. Knowledge and attitudes of students about human papillomavirus and HPV vaccine. Nurses' word 2018; 21(77): 4-9. doi: 10.5937/SestRec1877004A
8. Fu CJ, Pan XF, Zhao ZM, Saheb-Kashaf M, Chen F, Wen Y, et al. Knowledge, perceptions and acceptability of HPV vaccination among medical students in Chongqing, China Asian Pac J Cancer Prev 2014; 15(15):6187-93. doi: 10.7314/apjcp.2014.15.15.6187
9. Gottvall M, Tydén T, Höglund AT, Larsson M. Knowledge of human papillomavirus among high school students can be increased by an educational intervention. Int J STD AIDS 2010; 21:558–562. doi: 10.1258/ijsa.2010.010063.
10. Oh J-K, Lim MK, Yun EH, Lee E-H, Shin H-R. Awareness of and attitude towards human papillomavirus infection and vaccination for cervical cancer prevention among adult males and females in Korea: a nationwide interview survey. Vaccine 2010; 28:1854–1860. doi: 10.1016/j.vaccine.2009.11.079
11. Uzunlar Ö, Özyer Ş, Başer E, Toğrul C, Karaca M, Güngör T. A survey on human papillomavirus awareness and acceptance of vaccination among nursing students in a tertiary hospital in Ankara, Turkey. Vaccine 2013; 31(17):2191-5. doi: 10.1016/j.vaccine.2013.01.033.

was conducted in the territory of the municipality of Indjija and which included 490 adolescents aged 15-19, the age at the time of first sexual intercourse for adolescents was 16.33 years, while 2% of girls and about 5% of young men had sexually transmitted infections (15). In comparison with the adolescent population in Brazil based on the National Health Survey in 2009, it was found that adolescents entered sexual relations early. As many as a third of young people aged 14 years had their first sexual intercourse at the age of 12 or earlier, which is associated with unprotected relations and a greater number of partners during life (16).

Introducing new vaccines to the market and into national immunization programs is a complex and delicate process. The results of previous research indicate that the protection provided by the HPV vaccine is long-lasting and follow up studies are in progress in order to determine how long the immunity lasts (17-19). Post-marketing monitoring of side effects has shown that the HPV vaccine is highly safe. Since 2006, when it was first administered, no severe side effects related to previous immunization with the HPV vaccine have been registered (20-22). In countries with a high coverage of the HPV vaccine, as is the case in Australia, the frequency of pathological changes in the cervix has been reduced, and the same is expected when it comes to the occurrence of carcinoma (23,24). In its report for 2022, the WHO states that 38 of 53 countries in the European region, including Serbia, introduced the HPV vaccine by the end of 2021. With this result, over half of the middle-income countries in the region have access to this vaccine (25). In Serbia, active recommended immunization for diseases caused by HPV is being carried out for persons of certain age, which is more precisely determined by the Rulebook on the program of mandatory and recommended immunization of the population against certain infectious diseases (26,27). According to the professional, methodological guidelines of the Institute of Public Health of Serbia, this immunization is recommended for children over nine years old, before the first sexual intercourse, primarily for children in the sixth grade of elementary school, in two or three doses, depending on the age and type of vaccine (28).

Our cross-sectional study has a few limitations related to the type of study itself, subjective self-assessment of students' knowledge that can be interpreted differently and affect the quality of answers, as well as the possibility of obtaining socially desirable answers when it comes to lifestyles and habits. The strengths of this study are presented in the representativeness and size of the sample.

Conclusion

Education of young people about the ways of transmission of HPV infection and the possibilities of prevention (with an emphasis on the HPV vaccine) is a priority. A multidisciplinary approach and the involvement of relevant social, health and educational institutions are needed, which, with their well-planned and organized actions, would continuously work to improve reproductive health. Thus, the importance of this public health problem would be indicated and the space for raising the level of knowledge about the importance of HPV immunization with the HPV vaccine would be expanded in the near future.

Competing interests

The author declares no competing interests.

Literature

1. Rowley J, Vander Hoorn S, Korenromp E, Low N, Unemo M, Abu-Raddad LJ, et al. Global and Regional Estimates of the Prevalence and Incidence of Four Curable Sexually Transmitted Infections in 2016 Based on Systematic Review and Global Reporting. WHO Bulletin 2019;10(12): e0143304.
2. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2018;68(6):394-424. doi: 10.3322/caac.21492
3. Bray F, Soerjomataram I. The Changing Global Burden of Cancer: Transitions in Human Development and Implications for Cancer Prevention and Control. In: Gelband H, Jha P, Sankaranarayanan R, Horton S, editors. Cancer: Disease Control Priorities. Third Edition (Volume 3). Washington (DC): The International Bank for Reconstruction and Development/ The World Bank; 2015. pp.23-44.
4. WHO. Cancer prevention and control in the context of an integrated approach: report by the Secretariat. Geneva: World Health Organization, 2016.
5. Bruni L, Diaz M, Barrionuevo-Rosas L, Herrero R, Bray F, Bosch FX, et al. Global estimates of human papillomavirus vaccination coverage by region and income level: a pooled analysis. Lancet Glob Health 2016; 4(7): e453-63. doi: 10.1016/S2214-109X(16)30099-7

12. Tonguc E, Gungor T, Var T, Kavak E, Yucel M, Uzunlar O. Knowledge about HPV, relation between HPV and cervix cancer and acceptability of HPV vaccine in women in eastern region of Turkey. J Gynecol Oncol 2013; 24:7–13. doi: 10.3802/jgo.2013.24.1.7
13. Thomas T, Dalmida S, Higgins M. The Student Human Papillomavirus Survey: Nurse-Led Instrument Development and Psychometric Testing to Increase Human Papillomavirus Vaccine Series Completion in Young Adults. J Nurs Meas 2016; 24(2):226-44. doi: 10.1891/1061-3749.24.2.226
14. López N, Garcés-Sánchez M, Panizo MB, de la Cueva IS, Artés MT, Ramos B, Cotarelo M. HPV knowledge and vaccine acceptance among European adolescents and their parents: a systematic literature review. Public Health Rev 2020; 41:10.doi: 10.1186/s40985-020-00126-5
15. Rozekk Mitrovic T. Petrovic V. Visnjevac D. Sexual behavior and the impact on reproductive health of adolescents in the territory of the municipality of Inđija. Prev Ped 2016;2(1-2):37-44.doi: 10.2298/MPNS0404116M
16. Monteiro DLM, Brollo LCS, de Souza TP, dos Santos JRP, Santos GR, Tatiane Correa T, et al. Knowledge on the HPV vaccine among university students, journal of the SAO PAULA, institute of tropical medicine. Rev Inst Med Trop São Paulo 2018; 60:e46. doi: 10.1590/S1678-9946201860046
17. FUTURE II Study Group. Quadrivalent vaccine against human papillomavirus to prevent high-grade cervical lesions. N Engl J Med 2007; 356:1915–27. doi: 10.1056/NEJMoa061741.
18. Klein NP, Hansen J, Chao C, et al. Safety of quadrivalent human papillomavirus vaccine administered routinely to females. Arch Pediatr Adolesc Med 2012; 166:1140–8. doi: 10.1001/archpediatrics.2012.1451.
19. Pruski D, Łagiedo-Żelazowska M, Millert-Kalińska S, Sikora J, Jach R, Przybylski M. Immunity after HPV Vaccination in Patients after Sexual Initiation. Vaccines (Basel) 2022; 10(5):728. doi: 10.3390/vaccines10050728
20. Di Mario S, Basevi V, Lopalco PL, Balduzzi S, D'Amico R, Magrini N. Corrigendum to "Are the Two Human Papillomavirus Vaccines Really Similar? A Systematic Review of Available Evidence: Efficacy of the Two Vaccines against HPV". J Immunol Res 2017; 2017:4583487. doi: 10.1155/2017/4583487
21. Varricchio F, Iskander J, Destefano F, Ball R, Pless R, Braun MM, Chen RT. Understanding vaccine safety information from the Vaccine Adverse Event Reporting System. Pediatr Infect Dis J 2004; 23(4):287-94. doi: 10.1097/00006454-200404000-00002.
22. Wharton M. Vaccine safety: current systems and recent findings. Curr Opin Pediatr 2010; 22(1):88-93. doi: 10.1097/MOP.0b013e3283350425.
23. Dyda A, Shah Z, Surian D, Martin P, Coiera E, Dey A, Leask J, Dunn AG. HPV vaccine coverage in Australia and associations with HPV vaccine information exposure among Australian Twitter users. Hum Vaccin Immunother 2019; 15(7-8):1488-1495. doi: 10.1080/21645515.2019.1596712.
24. Newman PA, Logie CH, Lacombe-Duncan A, Baiden P, Tepjan S, Rubincam C, et al. Parents' uptake of human papillomavirus vaccines for their children: a systematic review and meta-analysis of observational studies. BMJ Open 2018; 8(4): e019206. doi: 10.1136/bmjopen-2017-019206
25. WHO Report, Equitable access to cervical cancer prevention in the WHO European Region increases as 4 more countries introduce HPV vaccination. Accessed: 27.11.2022. Available at: https://www.who.int/europe/news/item/16-11-2022-equitable-access-to-cervical-cancer-prevention-in-the-who-european-region-increases-as-4-more-countries-introduce-hpv-vaccination
26. Pravilnik o imunizaciji i načinu zaštite lekovima. Sl. glasnik RS, br. 88/2017, 11/2018, 14/2018, 45/2018, 48/2018, 58/2018, 104/2018, 6/2021, 52/2021 i 66/2022.
27. Pravilnik o programu obavezne i preporučene imunizacije stanovništva protiv određenih zaraznih bolesti. Sl. glasnik RS, br. 65/2020.
28. Institut za javno zdravlje Srbije „Dr Milan Jovanović Batut". Stručno-metodološko uputstvo za sprovođenje obavezne preporučene imunizacije stanovništva za 2021. godinu. Beograd: Institut za javno zdravlje Srbije „Dr Milan Jovanović Batut", 2021.

Primljen: 09.12.2022. **Revizija:** 25.12.2022. **Prihvaćen:** 27.12.2022.

6. Lei J, Ploner A, Elfström KM, Wang J, Roth A, Fang F, Sundström K, Dillner J, Sparén P. HPV Vaccination and the Risk of Invasive Cervical Cancer. N Engl J Med 2020; 383(14):1340-1348. doi: 10.1056/NEJMoa1917338.
7. Antić LJ, Antić D, Aleksopulos H, Despotović M, Zlatanović M. Znanja i stavovi studenata o humanom papiloma virusu i HPV vakcini. Sestirnska reč 2018; 21(77):4-9. doi: 10.5937/SestRec1877004A
8. Fu CJ, Pan XF, Zhao ZM, Saheb-Kashaf M, Chen F, Wen Y, et al. Knowledge, perceptions and acceptability of HPV vaccination among medical students in Chongqing, China Asian Pac J Cancer Prev 2014; 15(15):6187-93. doi: 10.7314/apjcp.2014.15.15.6187
9. Gottvall M, Tydén T, Höglund AT, Larsson M. Knowledge of human papillomavirus among high school students can be increased by an educational intervention. Int J STD AIDS 2010; 21:558–562. doi: 10.1258/ijsa.2010.010063.
10. Oh J-K, Lim MK, Yun EH, Lee E-H, Shin H-R. Awareness of and attitude towards human papillomavirus infection and vaccination for cervical cancer prevention among adult males and females in Korea: a nationwide interview survey. Vaccine 2010; 28:1854–1860. doi: 10.1016/j.vaccine.2009.11.079
11. Uzunlar Ö, Özyer Ş, Başer E, Toğrul C, Karaca M, Güngör T. A survey on human papillomavirus awareness and acceptance of vaccination among nursing students in a tertiary hospital in Ankara, Turkey. Vaccine 2013; 31(17):2191-5. doi: 10.1016/j.vaccine.2013.01.033.
12. Tonguc E, Gungor T, Var T, Kavak E, Yucel M, Uzunlar O. Knowledge about HPV, relation between HPV and cervix cancer and acceptability of HPV vaccine in women in eastern region of Turkey. J Gynecol Oncol 2013; 24:7–13. doi: 10.3802/jgo.2013.24.1.7
13. Thomas T, Dalmida S, Higgins M. The Student Human Papillomavirus Survey: Nurse-Led Instrument Development and Psychometric Testing to Increase Human Papillomavirus Vaccine Series Completion in Young Adults. J Nurs Meas 2016; 24(2):226-44. doi: 10.1891/1061-3749.24.2.226
14. López N, Garcés-Sánchez M, Panizo MB, de la Cueva IS, Artés MT, Ramos B, Cotarelo M. HPV knowledge and vaccine acceptance among European adolescents and their parents: a systematic literature review. Public Health Rev 2020; 41:10.doi: 10.1186/s40985-020-00126-5
15. Rožek Mitrović T. Petrović V. Višnjevac D. Seksualno ponašanje i uticaj na reproduktivno zdravlje adolescenata na teritoriji opštine Inđija. Prev Ped 2016;2(1-2):37-44. doi: 10.2298/MPNS0404116M
16. Monteiro DLM, Brollo LCS, de Souza TP, dos Santos JRP, Santos GR, Tatiane Correa T, et al. Knowledge on the HPV vaccine among university students, journal of the SAO PAULA, institute of tropical medicine. Rev Inst Med Trop São Paulo 2018; 60:e46. doi: 10.1590/S1678-9946201860046
17. FUTURE II Study Group. Quadrivalent vaccine against human papillomavirus to prevent high-grade cervical lesions. N Engl J Med 2007; 356:1915–27. doi: 10.1056/NEJMoa061741.
18. Klein NP, Hansen J, Chao C, et al. Safety of quadrivalent human papillomavirus vaccine administered routinely to females. Arch Pediatr Adolesc Med 2012; 166:1140–8. doi: 10.1001/archpediatrics.2012.1451.
19. Pruski D, Łagiedo-Żelazowska M, Millert-Kalińska S, Sikora J, Jach R, Przybylski M. Immunity after HPV Vaccination in Patients after Sexual Initiation. Vaccines (Basel) 2022; 10(5):728. doi: 10.3390/vaccines10050728
20. Di Mario S, Basevi V, Lopalco PL, Balduzzi S, D'Amico R, Magrini N. Corrigendum to "Are the Two Human Papillomavirus Vaccines Really Similar? A Systematic Review of Available Evidence: Efficacy of the Two Vaccines against HPV". J Immunol Res 2017; 2017:4583487. doi: 10.1155/2017/4583487
21. Varricchio F, Iskander J, Destefano F, Ball R, Pless R, Braun MM, Chen RT. Understanding vaccine safety information from the Vaccine Adverse Event Reporting System. Pediatr Infect Dis J 2004; 23(4):287-94. doi: 10.1097/00006454-200404000-00002.
22. Wharton M. Vaccine safety: current systems and recent findings. Curr Opin Pediatr 2010; 22(1):88-93. doi: 10.1097/MOP.0b013e3283350425.
23. Dyda A, Shah Z, Surian D, Martin P, Coiera E, Dey A, Leask J, Dunn AG. HPV vaccine coverage in Australia and associations with HPV vaccine information exposure among Australian Twitter users. Hum Vaccin Immunother 2019; 15(7-8):1488-1495. doi: 10.1080/21645515.2019.1596712.
24. Newman PA, Logie CH, Lacombe-Duncan A, Baiden P, Tepjan S, Rubincam C, et al. Parents' uptake of human papillomavirus vaccines for their children: a systematic review and meta-analysis of observational studies. BMJ Open 2018; 8(4): e019206. doi: 10.1136/bmjopen-2017-019206
25. WHO Report, Equitable access to cervical cancer prevention in the WHO European Region increases as 4 more countries introduce HPV vaccination. Accessed: 27.11.2022. Available at: https://www.who.int/europe/news/item/16-11-2022-equitable-access-to-cervical-cancer-prevention-in-the-who-european-region-increases-as-4-more-countries-introduce-hpv-vaccination
26. Rulebook on immunization and protection with drugs. Official Gazette RS, br. 88/2017, 11/2018, 14/2018, 45/2018, 48/2018, 58/2018, 104/2018, 6/2021, 52/2021 i 66/2022.
27. Rulebook on the program of mandatory and recommended immunization of the population against specific infectious diseases. Official Gazette RS, br. 65/2020.
28. Institute of Public Health of Serbia „Dr Milan Jovanovic Batut". Professional-methodological guidelines for mandatory recommended immunization of the population for 2021. Belgrade: Institute of Public Health of Serbia „Dr Milan Jovanovic Batut", 2021.

Received: 12/09/2022 **Revised:** 12/25/2022 **Accepted:** 12/27/2022