PUBLIC HEALTH

KNOWLEDGE ABOUT HUMAN PAPILLOMAVIRUS AND ASSOCIATED FACTORS AMONG POPULATION IN THE REPUBLIC OF KOSOVA

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Abstract

Above 70% of sexually active women and men will be infected with human papilloma irus at some point in their lives, and several may yet be infected in more than one circumstance. Around 80% of sexually active women acquire HPV infection, while for the most part, they are asymptomatic with the immune system-mediated clearance of contagion within 6–12 months. High-risk papillomavirus is accountable for causing cancer associated with the cervix, vulva, vagina, anus, penis, and oropharynx. This survey aims to investigate the level of knowledge among residents in the Republic of Kosova regarding human papillomavirus (HPV) infections and HPV-associated diseases and to discover the relationship between these factors. Material and methods: A cross-sectional survey was performed by investigating the knowledge concerning HPV infection in the population aged 18 to 35+ years. The study was conducted in the interval from June 2021 - August 2021. The sample included 500 participants. The questionnaire was anonymous, and participants were free to end the participation at any time, without finishing the questionnaire. Results: More than half of the respondents knew about HPV - 70.0%, and 29.6% did not know. Respondents with secondary and higher education showed 18 times more knowledge for HPV (OR = 18.1311 95% CI: 8.7465-37.5852) than respondents with primary education. To the question Can HPV cause cancer of the cervix, 37.2% (n=186) of the respondents gave a correct answer. The results presented that most participants knew what HPV was (70%), but they also revealed that most participants had low or moderate knowledge about HPV, which was a comparable result with earlier studies. A small number of participants in this survey knew that HPV could heal by itself (12.8%), which was similar to results presented in other surveys. Conclusions: It is important to improve the inadequate knowledge about HPV among the population in the Republic of Kosova. In order to do that, it could be significant to assess which factors affect the knowledge so that young women and all adolescents will get pushed to use protective measures against cervical cancer and have protected sexual behaviour.

ЈАВНО ЗДРАВЈЕ

ЗНАЕЊА ЗА ХУМАН ПАПИЛОМАВИРУС И ФАКТОРИ ПОВРЗАНИ СО НЕГО КАЈ НАСЕЛЕНИЕТО НА КОСОВО

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Извадок

Над 70% од сексуално активните жени и мажи ќе бидат заразенисо хуман папиломавирус во некоја фаза од нивниот живот, а неколку сепак може да бидат заразени во повеќе од една околност. Околу 80% од сексуално активните жени добиваат ХПВ инфекција, додека во најголем дел, тие се асимптоматски со отстранување на заразата посредувано од имунолошкиот систем во рок од 6-12 месеци. Високоризичниот папиломавирус е одговорен за предизвикување рак поврзан со грлото на матката, вулвата, вагината, анусот, пенисот и орофаринксот.Ова истражување има за цел да го провери нивото на знаење кај жителите во Република Косово во врска со инфекциите со хуман папиломавирус (ХПВ) и болестите поврзани со ХПВ и да ја открие врската помеѓу овие фактори. Материјал и методи: Спроведовме студија на пресек за знаењето на ХПВ инфекцијата кај популацијата на возраст од 18 до 35+ години. Студијата беше спроведена во интервалот од јуни 2021 до август 2021 година. Примерокот вклучи 500 учесници. Прашалникот беше анонимен, а учесниците можеа слободно да го прекинат учеството во секое време, без да го завршат прашалникот.Резултати: Повеќе од половина од испитаниците знаеја за ХПВ - 70,0%, а 29,6% од нив не знаеја. Испитаниците со средно и високо образование покажаа 18 пати повеќе знаење за ХПВ (OR= 18,1311 95% CI: 8,7465-37,5852) од испитаниците со основно образование. На тврдењето ХПВ може да предизвика рак на грлото на матката, 37,2% (n=186) од испитаниците дале точен одговор.Резултатите покажаа дека повеќето учесници знаеја што е ХПВ (70%), но тие исто така покажаадека повеќето учесници имаа ниско или умерено познавање за ХПВ, што е споредлив резултат со претходните студии. Мал број од учесниците во ова истражување знаеја дека ХПВ може сам да се лекува (12,8%), што е слично со резултатите од други истражувања.Заклучок: Од клучно значење е подобрување на несоодветното знаење за ХПВ кај луѓето во Република Косово. За да се направи тоа, би можело да биде значајно да се процени кои фактори влијаат на знаењето, така што младите жени и сите адолесценти ќе бидат принудени да користат заштитни мерки против рак на грлото на матката и да имаат заштитено сексуално однесување.

Introduction

Human papillomaviruses (HPVs) are an essential group of viruses affecting the cutaneous and mucosal epithelia. HPVs trigger diseases related to high morbidity and mortality rates, involving benign lesions and cancer[1].

Above 70% of sexually active women and men will be infectedat some pointin their lives, and several may yet be infected in more than one circumstance[2].

The projected incidence of HPV contagion is high, with 14 million people affected yearly and 79 million people with predominant infection[3]. HPV is linked with numerous cancer types in both men and women. Amongst women, in 2012, HPV was related with 74% of cancer cases, 70% of which were cervical cancer[4].

There is a need for evidence about the HPV registry and cervical cancer in Kosova; however, a survey led by Zejnullahu V. in 2016 in Kosova presented a high HPV frequency, estimated up to 50.93% (109 samples) out of 214 cervical samples[5].

Papillomaviridae family consists of more than 200 varieties of HPV, which are categorized into five classes: Alphapapillomavirus, Betapapillomavirus, Gammapapillomavirus Mupapapillomavirus, and Nupapapillomavirus[6]. All the classes are responsible for the numerous kinds of HPV-associated cancers.

Moreover, based on oncogenicity, the mucosal type (alpha) is divided into two subtypes which are low risk (LR), HPV 6, and HPV 11, which are recognized to cause benign genital warts, and high-risk (HR) cervical cancer[7]. HPV 6 and HPV 11 are also recognized to cause respiratory papillomatosis, predominantly in children[8].

High-risk papillomavirus is responsiblefor causing cancer associated with the cervix, vulva, vagina, anus, penis, and oropharynx[9]. Most infections are benign, leading to lesions such as cutaneous warts on the hands, feet, and anogenital zones. Only a small number of diseases with specific types of HPV can last and progress to cancer, such as oropharyngeal, cervical, vulvar, vaginal, and penile cancers[10].

Around 80% of sexually active women acquire HPV infection, while most of them are asymptomatic with the immune system-mediated clearance of the infection within 6-12 months[11].

Cervical cancer is undoubtedly the most widespread HPV-associated disease[10]. Almost all cases of cervical cancer are a result of a continued or chronic HPV infection. The fourth most recurrent cancer in women globally is cervical cancer, and it accounts for approximately 528,000 new cases per year[2].

Nearly 85% of the worldwide burden happens in the less developed countries, accounting for approximately 12% of all female malignancies. In 2012, an estimated 266,000 deaths were credited to cervical cancer, accounting for 7.5% of all female cancer deaths, with closely 90% of these deaths happening in the less developed countries[2].

In the developing regions, cervical cancer may cover up to 25% of all female cancer cases12 and is only led by breast cancer as the most frequent cause of cancer deaths in women globally[13].

Statistics on cancer percentages in Kosovo are unavailable as a national cancer office is in the procedure of re-launching, and recording procedures have yet to become official. However, incidence information presented for 2013 reported 224 breast and 27 cervical cancer cases. A survey led by Knowles and Packer in 2008 evaluated that at least 50% of female genital cancers in Kosova were not formally documented[14]. The 2015 annual report of the National Institute of Public Health of Kosova identified 68 new cases of cervical cancer in Kosova in 2015.

A further cross-sectional study in 2016 conductedby Romejko-Wolniewicz *et al.*, presented a high incidence degree of cervical cancer in Kosova ASR(W)=23.8, and a high mortality degree.

HPV may be transmitted throughout perinatal (during birth from mother to child)[16], genital infections (genitals, anus, or mouth of an affected sexual partner)[17], hands, shared object, blood, surgery (during laser ablation of a condyloma (wart) or electrocautery)[18] HPV does not transmit through ordinary stuff like toilet seats[16], although the types that cause warts may transmit through surfaces such as floors[19].

This survey aimed to investigate the level of knowledge regarding human papillomavirus (HPV) infections and HPV-associated diseases among residents in the Republic of Kosova and to discover the relationship between these factors.

Material and methods

A cross-sectional survey was performed by investigating the knowledge concerning HPV infection in the population aged 18 to 35+ years. The study was conducted in the period from June 2021 - August 2021.

The sample was obtained based on convenient selection, and included 500 participants.

Information from participants in the study group was gathered through interviews, using a predesigned questionnaire, online version: distribution via social media, paper version: distribution during student conferences, lectures, and distribution in libraries. Survey clarification was available whenever it was necessary. Each part of the questionnaire offers the objectives of the survey and the measures for protecting anonymity. Participation was voluntary, and all information was handled confidentially.

Criterion for inclusion was the age of the participants (from 18 to 35+ years). This age group is selected because it is the part of the population that is most vulnerable to HPV infection and HPV-associated diseases and a crucial part of the society that decides and will decide to vaccinate their children against HPV. The latter comes up from the fact that people subject to mandatoryHPV vaccination are 12-year-old girls who do not decide for themselves and whose vaccination needs their parents' permission.

Given that a validated questionnaire is not available in the Republic of Kosova, we remodelled a series of questions based on Knowledge, Attitude and Practice (KAP) survey in settings with a related socio-cultural situation to the Republic of Kosova to investigate KAP about HPV. We also conducted a pilot study to

test the validity and trustworthiness of the questionnaire. As reported by World Health Organization, KAP survey data can recognize how knowledge differences, cultural beliefs, or behavioral patterns may influence understanding and action and cause struggles or create obstacles for HPV vaccination.

The design of the questionnaire was guided by the survey and the literature review of the knowledge regarding HPV.

The questionnaire was composed of 2 groups. The first group of questions gives information on the sociodemographic characteristics of the respondents, including age, gender, location (urban or rural), level of education, occupation, marital status, and sexual activity of respondents. The second group refers to the respondents' knowledge about HPV and the source of transmission of HPV.

The pilot questionnaire was sent to 50 respondents, and according to the perceived response, corrections and adjustments were made to the target population and the survey's objectives.

The participation was voluntary; all information was handled in confidence. The participants were provided a detailed clarification of the reasons for the survey and were notified of the actions being taken to protect their anonymity. The questionnaire was anonymous, and participants were free to end the participation at any time, without finishing the questionnaire.

A password-protected computer was used to keep the excel sheets, and a secure lockable cabinet was also used to save filled questionnaires.

Results

The study for knowledge on human papillomavirus and associated factors included 500 respondents, citizens of the Republic of Kosova.

Sociodemographic data of the respondents

Prevalence of adult groups in the study ranged from 21.0% (age group from 18 to 21 years) to 18.8% (age group from 34+ years) (Table 1 and Figure1a). The percentage difference wasstatistically insignificantforp<0.05.

A larger percentage of respondents were from females 60.0%, and 40.0% were males (Table 1b).

The respondents surveyed mostly have completed secondary education - n=301 (60.2%), followed by those with university degree - n=108 (21.6%), and the lowest number were without education - n=24 (4.8%) (Table 1).

N=324 (64.8%) were from the city (urban environment) and n=176 (35.2%) were from the village (Table 1).

26.0% of the respondents were married, 40.4% were singles, 31.4% were in a relationship, other 0.4% and 1.8% were divorced (Table 1).

Approximately half of the respondents - 44.8% were employed, 33.4% were students, and 14.6% were unemployed, 3.0% were still in school and 4.2% had other kind of occupational status (Table1).

Table 1. Overview of the sociodemographic characteristics of the respondents

Age - Years	Count	Percentage
18 - 21	105	21.0
22 -25	101	20.2
26 – 29	100	20.0
30 – 33	100	20.0
34+	98	18.8
Gender		
Male	200	40.0
Female	300	60.0
Education		
No education	24	4.8
Elementary	67	13.4
High School	301	60.2
University	108	21.6
Place of Residence		
Urban	324	64.8
Rural	176	35.2
Marital Status		
Single	202	40.4
Married	130	26.0
Other	2	0.4
In a relationship	157	31.4
Divorced	9	1.8
Occupational Status		
Student	167	33.4
Employed	224	44.8
Unemployed	73	14.6
School	15	3.0
Other	21	4.2

Sexual activity

69.4% of the respondents were sexually active, most of them (51.0%) had only one sexual intercourse in the last year, and 22.8% of them used a condom (Table 2).

Knowledge about Human Papillomavirus

More than half of the respondents knew about HPV - 70.0%, and 29.6% of them did not know; the percentage difference was statistically significant for $p<0.05$ (Difference test, $p=0.0000$).

Table 2. Overview of the sociodemographic characteristics of the respondents

Are you sexually active?	Count	Percentage
Yes	347	69.4
No	144	28.8
Missing	9	1.8
How many sexual partners have you had in the past 12 months?		
0	150	30.0
1	255	51.0
2-3	59	11.8
4-5	14	2.8
5+	13	2.6
Missing	9	1.8
Did you use a condom at your last sexual intercourse?		
No	377	75.4
Yes	114	22.8
Missing	9	1.8

No relationship (for $p>0.05$) was registered between demographic characteristics (age, gender, marital status, sexual activity, number of partners) versus whether HPV was known (Pearson Chi-square: 9.11173,df=4,p=.058374; Pearson Chi-square: 3.63155, df=1, p=.056697; Pearson Chi-square: 6.31422, df=4, p=.176888; Pearson Chi-square: .005119, df=1, p= .942961; Pearson Chi-square: 7.40833, df=4, p=.115829).

There was a correlation(for $p<0.05$) between sociodemographic characteristics (place of living, level of education, employment status, condom use) and HPV knowledge (Pearson Chi-square: 7.98593, df=1, p=.004715; Pearson Chi-square: 97.5601, df=3, p=0.00000; Pearson Chi-square: 73.8518, df=4, p=.000000; Pearson Chi-square: 8.29637, df=1, p=.003973).

Respondents from urban areas showed 1.7 times (OR = 1.7037 95% CI: 1.1757-2.4688) greater knowledge for HPV than respondents from rural areas.

Respondents with secondary and higher education showed 18 times more knowledge for HPV (OR = 18.1311

95% CI: 8.7465-37.5852) than respondents with primary education.

The employed respondents showed 7 times more knowledge for HPV (OR= 6.8182 95% CI: 3.5464-13.1082) than non-employed respondents.

Students showed 8 times (OR = 7.9895% CI: 4.1057-15.5296) more knowledge than unemployed respondents.

Respondents who used a condom showed 2 times (OR = 1.9015 95% CI: 1.2233-2.9557) more knowledge for HPV than respondents that did not use a condom.

Table 3. Presentation of the knowledge of respondents about HPV

Do you know what human papillomavirus (HPV) is?	Count	Percentage
Yes	350	70.0
No	148	29.6
Missing	2	0.4

In the multiple answers, 42.0% of respondents did not know the way of HPV transmission. 48.6% of respondents knew about transmission through vaginal sex, 34.6% through anal and 30.6% through oral sex; 1.4% (7) of respondents did not answer.

More than half of the respondents, 54.2%, know about the way HPV is transmitted.

Table 4. Presentation of the knowledge of respondents for transmission of HPV

Do you know what human papillomavirus (HPV) is?	Count	Percentage
I don't know	210	42.0
Through vaginal sex	243	48.6
By touching the genitals	37	7.4
Anal sex	173	34.6
Oral sex	153	30.6
Sitting on the WC	56	11.2
During delivery from mother to child	72	14.4
Other	2	0.4
Missing	7	1.4

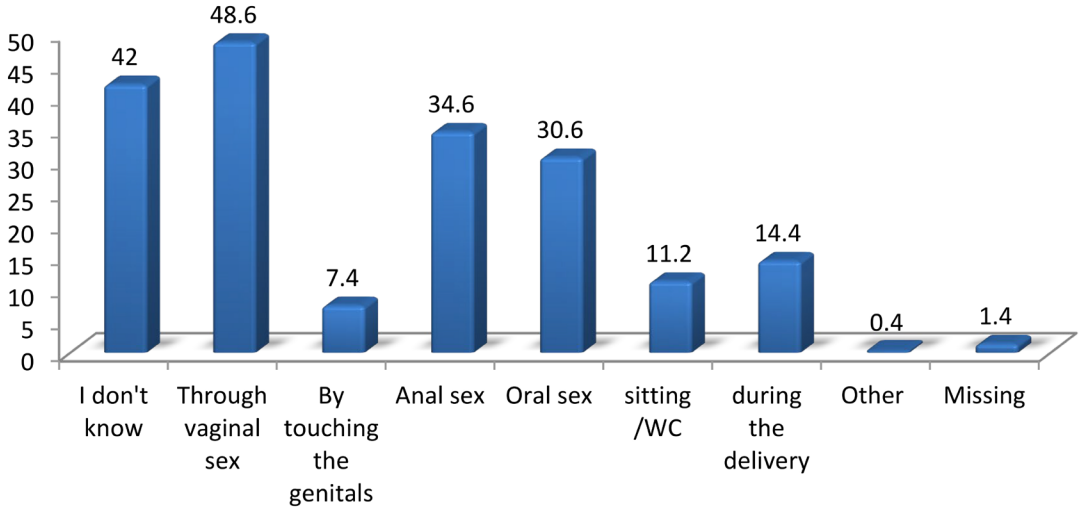

Figure 1. Presentation of the knowledge of respondents for HPV transmission in percentage

No correlation was registered (for p>0.05)between sociodemographic characteristics (gender, marital status, sexual activity, number of partners) and the mode of HPV transmission (Pearson Chi-square: .164483, df=1, p=.685062;Pearson Chi-square: 7.38793, df=4, p=.116754;Pearson Chi-square: .150191, df=1, p=.698353; Pearson Chi-square: 5.20195, df=4, p=.267197).

To the question *Can HPV heal by itself*, the largest number of respondents, 60.8% (n=304), responded I do not know, 25.4% (n=127) of the respondents gave false answer, 12.8% (n= 64) gave true answer and 1.0% (n=5) of the respondents did not answer. The percentage difference between the unknown answer versus the other modes of choice was statistically significant for p<0.05 (Differential test P= 0.0000) (Table 5).

Table 5. Answers of respondents about healing of HPV

Can HPV heal by itself [TRUE]		
I don't know	304	60.8
False	127	25.4
True	64	12.8
Missing	5	1.0

To the question *Can HPV be cured by taking antibiotics*, 59.8% (n=299) responded I do not know, 15.6% (n=78) of respondents chose true option, 23.4% (n=117) false option and 1.2% (n=6) of respondents did not answer. Percentage difference between unknown answer and other options was statistically significant for p<0.05(Difference test P=0.0000) (Table 6).

Table 6. Answers of respondents on the question *Can HPV be cured by taking antibiotics*

Can HPV be cured by taking antibiotics [FALSE]		
True	78	15.6
I don't know	299	59.8
False	117	23.4
Missing	6	1.2

To the question *Can HPV can cause cancer of the cervix/mouth of the womb*, most of the respondents, 58.4% (n=292), did not know. 37.2% (n=186) of respondents gave a correct answer, 2.4% (n=12) incorrect and 2.0% (n=10) did not answer. The percentage difference between the unknown and the options was statistically significant for $p<0.05$ (Difference test P=0.0000) (Table 7).

Table 7. Answers of respondents about HPV consequences

Can HPV cause cancer of the cervix/mouth of the womb [TRUE]		
I don't know	292	58.4
True	186	37.2
False	12	2.4
Missing	10	2.0

Discussion

To the best of our information, the current survey is the most extensive and more comprehensive research conducted to gather information on the level of knowledge regarding human papillomavirus (HPV) infections and HPV-associated diseases in the Republic of Kosova and to discover the relationship between these factors. Seventy percent of the participants knew what HPV was. More than half of the respondents, 54.2%, knew how HPV was transmitted. Of these, the most common answer of the respondents, 48.6% was transmission through vaginal sex. 69.4% of the respondents were sexually active. Most of them (51.0%) had only one sexual intercourse in the last year, and 22.8% used a condom during the previous intercourse.

The results showed that most participants knew what HPV was (70%),

but they also revealed that most participants had low or moderate knowledge about HPV, which is a comparable result with earlier studies[20-26]. Numerous studies[20,26-27]have confirmed that if the level of education is higher, then the knowledge of HPV is significantly greater. A Swedish survey[22] has demonstrated that not only educational level but also income is a cause related to knowledge. It would be interesting to explore if income correlates with knowledge. Lacking information could also be a reason for poor knowledge about HPV[21]. Thus, it could be interesting to explore what kind the information is given. The results indicate the extreme necessity for public education that tackles such lack of information amongst this group of topics. A small number of participants in this survey knew that HPV could heal by itself (12.8%), which is similar to other surveys[20,26]. More than half of the participants in this survey knew that HPV was a sexually transmitted infection, which is in agreement with the results from other surveys[20-21,26]. 37.2% of participants in this survey knew that HPV could cause cervical cancer, but 58.4% did not know this. This outcome is similar to numerous other studies[20-21,26]. The deficit knowledge of HPV and the fact that 75.4% of participants did not use a condom at their last intercourse is considered to be severe as HPV is the most common sexually transmitted infection[28], and cervical cancer is caused by HPV[28]. It is fundamental to broaden the knowledge of HPV so that people will understand how to avoid the infection from ever happening and so that young men and women will have protected sexual behavior.

This survey has some possible limitations. Firstly, the survey questions were explored by a cross-sectional study design. Such a strategy prevents the determination of fundamental associations among various factors and results. Secondly, evidence was collected by self-reported questionnaire, and hence, several answers might have described incorrect data. Apart from this criticism, the privacy of the survey might have lowered the deviation in the answers. This research, though, presents significant strengths: firstly, it delivers evidence from a vast number of participants, and this permits investigation of extremely weak relations among variables; secondly, the information was complete; thirdly, the participation percentage was very high, perhaps indicating increased curiosity for this study.

Conclusion

A significant number of the population contributing to this survey had a poor knowledge about HPV. It is crucial to improve the inadequate knowledge about HPV among the people in the Republic of Kosova to change behavior in order to be vaccinated against HPV. As a footstep towards getting a lower rate of cervical cancer and reducing the number of deaths because of the disease, serious efforts in health education are required. The preventive work needs upgrading. To do so, it could be significant to assess which factors affect the knowledge so that young women and all adolescents will get pushed to use protective measures against cervical cancer and have protected sexual behavior.

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