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KNOWLEDGE OF PREVENTION AND TREATMENT OF HUMAN PAPILLOMAVIRUS (HPV) INFECTIONS AMONG YOUNG MEN

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A – study design, **B** – data collection, **C** – statistical analysis, **D** – interpretation of data, **E** – manuscript preparation, **F** – literature review, **G** – sourcing of funding

ABSTRACT

Background: Today, human papillomavirus (HPV) infection has become the most common sexually transmitted disease worldwide. Major consequences of contracting the virus include both mild skin lesions and a range of cancers, the most frequent of which are cervical cancer, penile cancer, oral cavity cancer, throat cancer, and anal cancer, undoubtedly demonstrating its high oncogenic potential.

Aim of the study: The objective of this study is to determine the level of knowledge among men aged 18–26 years with regard to HPV prevention and treatment.

Material and methods: An online survey was conducted using a questionnaire developed by the authors. The questionnaire was comprised of 16 closed-ended questions and 5 questions pertaining to demographics. Chi-squared tests or Spearman's rank correlation coefficients were used for the statistical analysis.

Results: Only 27.5% of the respondents correctly answered a question regarding the number of types of the virus, and 33% correctly determined the percentage of the cases where an active infection turns into a chronic state. However, a high level of awareness of the routes of infection was demonstrated, with more than half of the respondents (63%) answering this question correctly. Additionally, more than two-thirds (67.9%) of the men indicated correctly that one of the factors facilitating infection is a young age at the time of the first contact with the virus. Nearly all respondents (90%) indicated that using condoms is an effective form of prevention.

Conclusions: The results expressly indicate an insufficient level of knowledge regarding HPV among young men. Due to the high level of sexual activity in this age group, increased education with regard to the prevention of sexually transmitted diseases is needed.

KEYWORDS: human papillomavirus, cervical cancer, prevention

Background

Human papillomavirus (HPV) belongs to the papillomavirus family that includes over 100 types [1]. The genetic material of this virus is characterized by circular double-stranded DNA [2]. The HPV virus is transmitted through contact with either the skin or mucosa of an infected individual, or via so-called autoinoculation (i.e., scratching and rubbing) [1]. HPV infection is the most common sexually transmitted disease in the world, and it is believed that up to 40 types of the virus have oncogenic

potential [3]. The HPV types with a low oncogenic potential include 6, 11, and 42, whereas those with a high oncogenic potential include 16, 18, and 31 [4]. A HPV infection may lead to mild skin lesions (i.e., warts), flat condyloma, and genital warts, or, depending on the oncogenicity of the virus, can lead to malignant neoplasms (e.g., cervical cancer) [5]. According to statistical data, cervical cancer is the third most frequent malignant neoplasm in women worldwide and second when it comes to the number of deaths caused [6]. Thus, HPV infection one of the most serious problems that modern gynecology faces. The first screening techniques for cervical cancer, based on the Pap smear, were introduced in the 1960s, and these methods have been continuously improved over subsequent decades, which has undoubtedly has helped to fight the disease [7]. Another potential consequence of contracting the HPV virus is cancer of the anogenital area, as well as head and neck cancer [3].

In 1983, it was suggested for the first time that HPV might have an impact on the carcinogenesis of the above-mentioned cancers [8]. According to numerous studies, HPV is now believed to be a main cause of these diseases, particularly among the inhabitants of developed countries [9]. It has also been shown that the oncogenetic process occurs more often in individuals with decreased immunity and in those with a state of chronic infection. According to data, up to half of the human population will experience a HPV infection at some point in their lives [10]. In many European Union countries, HPV vaccines are included in the basic vaccination program and are publically funded [11]. In Poland, vaccination against HPV is not obligatory, but it is included in the group of recommended vaccinations. HPV vaccination in Poland is funded by local government units under preventative programs or by the household budgets [12]. Despite the fact that the etiology of cancers of the reproductive organs is well-known, HPV deserves special attention and should be treated separately in further research related to routes of infection, treatment, prevention, and diagnostics [13].

Aim of the study

This study aims to determine the level of knowledge among men aged 18–26 with regard to both the prevention and treatment of HPV infections. The following detailed question was raised: Do the men covered by the study have basic knowledge concerning the prevention and treatment of HPV infections? It was assumed that the knowledge among young men with regard to HPV infection, prevention, and diagnosis is insufficient.

Material and methods

Study design

This study was cross-sectional in nature.

Setting

An electronic survey comprised of questions relating to both the prevention and treatment of HPV infection was disseminated.

Participants

In total, 328 men aged 18–26 years completed the questionnaire. The demographics of the study population are summarized in Table 1.

Data sources/measurement

The questionnaire, developed by the authors, was based on a review of the current literature. It consisted of 16 closed single-choice questions regarding HPV-related knowledge and 5 demographics questions. The survey was conducted anonymously. The surveyed men came from different localities, and had different levels of education and marital status.

Statistical methods

IBM SPSS Statistics 26 was used for the statistical analysis. In order to examine relationships between the data, chi-squared tests or Spearman's rank correlation coefficients were used (due to the lack of normal distribution in the data). The significance level was set at $p<0.05$.

Results

Descriptive data

The largest group among the respondents comprised men aged between 22–23 years, living in a city of over 250,000 inhabitants. In most cases, these were single men who currently study or have studied courses unrelated to medicine. The detailed characteristics of the sample are presented in Table 1.

The results allowed for the examination of selected fragments of HPV-related knowledge in the group surveyed. Only 27.5% of the respondents correctly indicated the number of HPV types (over 100), and only 13.5% were able to approximate the number of

Table 1. Characteristics of the sample (n=328)

Variable		Number (n)	Percentage (%)
Age (in years)	18	12	3.7
	19	13	4.0
	20	17	5.2
	21	44	13.4
	22	74	22.6
	23	69	21.0
	24	45	13.7
	25	15	4.6
	26	34	10.4
	No data available	5	1.4
Place of residence	Village	65	19.8
	Town <50,000	66	20.1
	Town <100,000	44	13.4
	Town ≤250,000	33	10.1
	City >250,000	115	35.2
	No data available	5	1.4
Marital status	Single	301	91.9
	Married	12	3.6
	Separated	4	1.2
	Divorced	4	1.2
	Widower	1	0.3
	No data available	6	1.8
Education	Elementary	3	0.9
	Junior high	5	1.4
	Vocational	17	5.2
	High	184	56.1
	Higher	113	34.6
	No data available	6	1.8
	Does/did not study	73	22.3
	Studies/studied a medical course	63	19.2
	Studies/studied a non-medical course	185	56.4
	No data available	7	2.1

individuals in the population experiencing infection with the virus (half of the population). Only one-third (33%) of the respondents were able to correctly determine the percentage of cases where an active infection turns into a chronic form (20% of the infected).

Regarding the respondents' knowledge of how HPV is transmitted, more than half of the respondents (63%) answered this question correctly. A detailed distribution of correct answers broken down by age, education, and place of residence is presented in Table 2. While some differences were observed, they were not statistically significant.

The results allow also for an examination of additional elements regarding the respondents' HPV-related knowledge. One-fourth of the group surveyed (24.2%) knew that an infection usually takes place at the age of 20–24 years. More than two-thirds (67.9%) of all respondents knew that the factors facilitating infection include a young age when first contact with the virus occurs. More than half (52.6%) of the respondents also correctly indicated that the risk of contracting an oncogenic HPV type is borne by a woman from the moment of sexual initiation through the entire period of her sexual activity.

An important question from the perspective of prevention is knowledge of HPV vaccination. 147 respondents provided the correct answer to a question regarding vaccination. Table 3 presents a detailed

Table 2. Knowledge of routes of infection broken down by education, age, and place of residence

Variable		Correct answer		Wrong answer		p-value
		N	%	n	%	
Education	Elementary	1	33.3	2	66.7	0.487
	Junior high	3	60.0	2	40.0	
	Vocational	9	52.9	8	47.1	
	High	123	66.8	61	33.2	
	Higher	68	60.2	45	39.8	
Age	18	8	66.7	4	33.3	0.264
	19	8	61.5	5	38.5	
	20	13	76.5	4	23.5	
	21	28	63.6	16	36.4	
	22	40	54.1	34	45.9	
	23	39	56.5	30	43.5	
	24	33	73.3	12	26.7	
	25	10	66.7	5	33.3	
	26	26	76.5	8	23.5	
Place of residence	Village	36	55.4	29	44.6	0.468
	Town <50,000	40	60.6	26	39.4	
	Town <100,000	28	63.6	16	36.4	
	Town ≤250,000	22	66.7	11	33.3	
	City >250,000	79	68.7	36	31.3	

Table 3. Knowledge of vaccination broken down by education, age, and place of residence

Variable		Correct answer		Wrong answer		p-value
		n	%	n	%	
Education	Elementary	2	66.7	1	33.3	0.301
	Junior high	4	80.0	1	20.0	
	Vocational	5	29.4	12	70.6	
	High	82	44.6	102	55.4	
	Higher	53	46.9	60	53.1	
Age	18	8	66.7	4	33.3	0.140
	19	7	53.8	6	46.2	
	20	4	23.5	13	76.5	
	21	16	36.4	28	63.6	
	22	35	47.3	39	52.7	
	23	26	37.7	43	62.3	
	24	26	57.8	19	42.2	
	25	8	53.3	7	46.7	
	26	16	47.2	18	52.9	
Place of residence	Village	26	40.0	39	60.0	0.267
	Town <50,000	25	37.9	41	62.1	
	Town <100,000	23	52.3	21	47.7	
	town ≤250,000	13	39.4	20	60.6	
	City >250,000	59	51.3	56	58.7	

Table 4. Knowledge of the diagnostic methods for HPV infection broken down by education, age, and place of residence

Variable		Correct answer		Wrong answer		p-value
		n	%	n	%	
Education	Elementary	0	0	3	100	0.036
	Junior high	0	0	5	100	
	Vocational	2	11.8	15	88.2	
	High	44	23.9	140	76.1	
	Higher	34	30.1	79	69.9	
Age	18	0	0	12	100	0.005
	19	3	23.1	10	76.9	
	20	4	23.5	13	76.5	
	21	6	13.6	38	86.4	
	22	16	21.6	58	78.4	
	23	20	29.0	49	71.0	
	24	16	35.6	29	64.4	
	25	5	33.3	10	66.7	
	26	10	29.4	24	70.6	
Place of residence	Village	14	21.5	51	78.5	0.522
	Town < 50,000	15	22.7	51	77.3	
	Town < 100,000	16	36.4	28	63.6	
	Town ≤ 250,000	4	12.1	29	87.9	
	City > 250,000	31	27.0	84	73	

analysis of the breakdown of answers by sociodemographic variables. The differences observed proved to be statistically insignificant.

Bearing in mind that health behaviors are of particular importance for effective prevention, this variable was studied as well. Most of the respondents (67.4%) possessed knowledge of asymptomatic HPV infection and were aware that the virus may be transmitted to other people. However, only one-third (34.6%) of the respondents knew that HPV infections can resolve without medical intervention between 12 and 24 months after initial infection. Nearly all of the respondents (90%) indicated that using a condom is an effective preventative measure against infection.

With regard to knowledge of the diagnostic methods for HPV infection, eighty respondents (25%) correctly indicated the main diagnostic method. Statistically significant differences were observed upon analysis. Older men ($p = 0.005$) and men with higher education ($p = 0.036$) chose the correct answer more frequently. A detailed analysis of the distribution of answers broken down by the selected variables is presented in Table 4.

Discussion

In 2008, Harald zur Hausen provided strong evidence connecting HPV infection with the development of cervical cancer. In addition, he co-developed a vaccine against various types of the virus, particularly the oncogenic types [4]. Today, we know that this discovery was a breakthrough and contributed to a great number of changes in modern gynecologic oncology. Vaccination against HPV is now the main preventative measure taken against this virus on a global scale. According to the research conducted by Arbyn et al., which was published in 2018, vaccination against HPV effectively reduces the risk of contracting cervical cancer in adolescent girls and women aged between 15 and 26 [14].

Various studies have assessed women's knowledge of HPV, its prevention and treatment, both among schoolgirls and older or pregnant women. In contrast, there are few published studies on men's knowledge. It is important to emphasize that gender awareness plays a key role in the prevention, early diagnosis, and treatment of HPV infection.

The current study surveyed 328 men aged between 18 and 26 years. The largest age group was comprised of men aged 22 (22.9% of all respondents) and the sample was dominated by inhabitants of cities with over 250,000 people (34.6%). More than half of the respondents (57.6%) did not take any medical courses. The knowledge of the respondents regarding HPV appeared to be insufficient.

Key results

Many people start to gain basic knowledge related to HPV as late as at the moment they decide to get vaccinated. Research by Krawczyk et al. indicates a relationship between the motivation to get vaccinated against HPV and respondents' basic knowledge of the virus, and the possibility of any adverse effects occurring afterwards [15].

Most articles published in the Polish scientific literature are related to women's knowledge of HPV infections. Due to the potential routes of infection, including hazardous sexual intercourse, using the personal hygiene objects of an infected person and contact with the skin, awareness among men is equally crucial. According to various studies, on average, individuals in Poland experience their first sexual intercourse at the age of 18 [12], and the stage of early adulthood is associated with an increased incidence of hazardous sexual behavior. Therefore, information about HPV should be particularly distributed among this age group. The most common age of onset of HPV infection is between 20 and 24 years. According to the current survey, almost a quarter of the respondents gave the correct answer in response to a question on this fact.

A study conducted on a group of high school students aged between 18 and 19 in Bydgoszcz, which was published in 2016, indicated that 40% of participants had already engaged in sexual activities. The authors reported that as many as 83% of the respondents believed that using condoms is one of the ways of preventing sexually transmitted diseases [11]. The results obtained in the current study confirm this – when asked about behaviors facilitating prevention of HPV infection, more than 87% of the respondents indicated the use of condoms during a sexual intercourse. In addition, according to the current survey, more than two-thirds (67.9%) of the respondents cited exposure to the virus at a young age as a factor that increases the risk of getting the disease.

Interpretation

A previous study examining knowledge of the prevention of HPV among youth indicated a low level of knowledge among boys attending high school. Only 45.23% of the respondents correctly indicated that protective vaccinations against HPV are available for both girls and boys [5]. The results of the current study indicate a similar level of knowledge. More than 45% of the respondents claimed that there are vaccines against HPV that are available irrespective of sex. The prior study, published in 2012, also analyzed the level of knowledge among boys on how HPV is transmitted, and only 29.76% of the respondents were familiar with this matter [9]. In the present survey, as many as

63% of the respondents chose correct answers related to the possible ways of contracting HPV.

The risk of contracting HPV is borne by all sexually active persons, irrespective of their sexual orientation, gender, or biological sex. A study conducted in 2018 by Grace et al. indicates that most men suffering from HIV were not aware of the fact that HPV vaccines are available to everyone, irrespective of sex. The respondents also did not deem HPV to be a serious health issue, despite the viral disease that they had already contracted [16]. Similar results were obtained in a study conducted by Gillis et al., where it was confirmed that the level of HPV knowledge among men who have been diagnosed with HIV is insufficient [17]. On the other hand, as per the current survey, the majority of the respondents (67.4%) had knowledge regarding asymptomatic HPV infection and were aware that it can be transmitted to others.

Generalizability

The present study indicates that the level of HPV-related knowledge among men aged 18–26 years is insufficient and requires improvement. Increasing knowledge in this respect could lead to a reduction in the number of dangerous sexual activities undertaken and improvements in the awareness of methods that can prevent sexually transmitted diseases. A study published in 2013 indicates considerable differences in the level of HPV-related knowledge among women and men, with women being more aware of HPV than men [18]. Therefore, the education of young people in this area is crucial and matters considerably when it comes to passing appropriate values and knowledge to future generations.

Limitations of the study

The main limitation of the current study concerns the method used for data collection. As the survey was conducted in an online and anonymous form, doubts may be raised about the reliability of the results.

Conclusions

Young men do not possess sufficient basic knowledge of HPV and knowledge related to the prevention of HPV infection is fragmentary. The study sample is presumed to have the highest levels of sexual activity and likely the greatest number of sexual partners. Therefore, knowledge of sexually transmitted diseases, in particular HPV, is extremely crucial and should be improved among young people.

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