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The role of preventive vaccinations in the prevention of cervical cancer according to female nursing and education students

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Abstract

Introduction. Cervical cancer is a significant problem in the area of public health. The major difficulty in the diagnosis of this type of cancer is the fact that it does not show any symptoms in its early stages.

Aim. The aim of the study was the assessment of knowledge exhibited by nursing and education students regarding vaccinations designed to prevent cervical cancer.

Materials and method. The study was conducted in the period 2023 with the use of a self-developed survey. A total of 107 female students participated in the study. The research tool employed was an anonymous self-developed questionnaire. All of the analyses, such as the Chi-square test at an accepted significance level of $\alpha = 0.05$.

Results. Among the group of female university students surveyed, 71.96% had only heard of preventive vaccinations, while as much as 18.69% had no knowledge of vaccinations, and only 9.35% of female students rated their knowledge of vaccinations as appropriate. In the surveyed group, 80% of the group of students majoring in education and 20% of the group of students majoring in nursing had never heard of HPV vaccinations before. Of the nursing students,75% indicated support for the concept of HPV vaccinations being given only to volunteers, compared to 25% of the education students.

Conclusions. The level of knowledge regarding cervical cancer is significantly higher among nursing students than among those getting a degree in education. The field of study has an impact on students' knowledge about the existence of the HPV vaccine. The students surveyed indicated that HPV infection, having multiple sexual partners, and age are the main factors contributing to cervical cancer.

Keywords: cervical cancer, health awareness, vaccinations, human papillomavirus, female students.

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INTRODUCTION

Cervical cancer (CC) accounts for 4% of all cancers diagnosed worldwide. However, cervical cancer is the third leading cause of death worldwide, which signifies a health outcome disparity [1-3].

The incidence of CC varies with age, with the rates increasing after the age of 25. In countries with the highest incidence rates, most cases occur at the age of 40, while in countries with low incidence, the range of 55-69 years is the age at which most patients with this disease are diagnosed [2-5].

Important factors in the prevention of CC are the reduction of the incidence of new infections, primary prevention, which aims to reduce exposure, and secondary prevention, which introduces measures to assist in the early detection of symptoms. The cornerstone of prophylaxis is eliciting a change in health behaviors. This applies to both women and men. According to women, it is important to introduce safe sex behaviours such as: delayed onset of sexual activity, avoiding casual intercourse or sexual activity with people who have had multiple sexual partners in the past. It is necessary to use latex condoms during intercourse to reduce the risk of infection [5,6].

According to data for 2022 from the Statistics Poland (SP), the highest percentage of new cases of illness registered nationwide in Poland were genital cancers – 20.2% (35,300 cases, 3,300 more than in 2021). The incidence rate of malignant tumors found in genital organs was 93.4 cases per 100 000 Poles (9.0 cases more than in 2021 and 9.9 more than in 2019 before the COVID-19 pandemic), ranking them in first place. The third most commonly diagnosed malignant tumor

among women in Poland in 2022 was genital cancer – 14.5% of all cases (12,700, similar to the previous year) [7]. According to the Polish National Cancer Registry (PNCR), 11,399 women aged 0-85+ developed CC, between 2019 and 2023, out of whom 7,216 died [8]. The aforementioned data show the gravity of this problem in the context of public health and the importance of health education and prevention in this area.

AIM OF THE STUDY

The aim of the study was to assess the knowledge of female students of medical and non-medical university students regarding preventive vaccinations in the prevention of cervical cancer.

MATERIALS AND METHOD

The study was conducted between March and May 2023. Information about the study was provided to students by their year supervisors. The research involved a sample of female students of nursing and education degrees at Jan Kochanowski University in Kielce, with the consent of the heads of these departments. A total of 150 respondents expressed their willingness to participate in the study. Their participation was voluntary and anonymous. The respondents voluntarily and consciously agreed to take part in the study. The analysis conducted for the purpose of the study included only the data gathered from 107 respondents who correctly (and completely) answered the questionnaire items. The study used a diagnostic survey method and a questionnaire as a data collection technique. Due to the lack of a standardized research tool that could be used to measure the level of knowledge and use of preventive vaccinations among female students, the research tool used was a self-developed questionnaire. The questionnaire consisted of 28 items. The first part of the questionnaire consisted of five questions concerning sociodemographic data, the second part included five questions related to information about cervical cancer, and the third part consisted of eighteen questions assessing information about HPV vaccinations. The questionnaire had not been verified beforehand, as the study was preliminary in nature. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki [9].

Microsoft Excel (Microsoft Office) was used to compile the statistical data. Statistical analysis was performed with the use of the Statistica 13.1 PL statistical software (licensed by Jan Kochanowski University in Kielce). The Chi-square test was conducted to analyze the collected quantitative data between the distinct groups, at the accepted significance level of $\alpha = 0.05$.

RESULTS

A total of 107 female students participated in the study. Among the respondents, 56 women (52.34%) were nursing students, while 51 (47.66%) were education students. The largest age group consisted of 52 students (48.60%) aged 21-25, followed by 24 students aged 18-20 (22.43%), and 22 students aged 26-30 (20.56%), while the smallest group, which consisted of students over 31 years of age, included 9 students (8.41%).

The sample of respondents included 62 students (57.94%) indicated living in rural areas, while 45 students (42.06%) live in cities. The majority of the participating students describe their socioeconomic situation as good (72 students, 67.29%) or very good (31 students, 28.97%), while the smallest group, consisting of 4 students (3.74%), describes their situation as poor.

Most of the students (71, or 66.36%) had never been pregnant, while 21 students (19.63%) had been pregnant once. Ten students (9.35%) had been pregnant twice. The smallest demographic group consisted of five students (4.67%) who had been pregnant more than two times before. The study shows that most students (72, or 67.29%) do not have children, 23 students (21.50%) have one child, and 9 (8.41%) have two children. The smallest demographic group of respondents consists of 3 (2.80%) students who have more than two children.

According to the respondents, the most reliable source of information on cervical cancer is a doctor, with as many as 81 people (75.70%) indicating they would want to obtain information from one. Significantly fewer students (only 24, or 2.43%) would prefer to find information on the Internet. Only 2 women (1.87%) would want to obtain information from television. According to the students participating in the research, access to reliable information on cervical cancer prevention is easy, as indicated by 48 students (44.86%). Of the respondents, 40 students (37.37%) stated that they have problems finding reliable information, while 19 students (17.76%) have no opinion on the subject.

According to the surveyed students, the contributing factors to the development of cervical cancer include having a high number of sexual partners, as reported by 68 respondents (63.55%), while 66 respondents (61.88%) believe that HPV infection is a factor in the development of cervical cancer, and 44 respondents (41.12%) believe that smoking constitutes a risk factor. Age was indicated as a risk factor by 38 respondents (35.51%), while 31 respondents (28.97%) answered that the use of oral contraception was another such factor, and 18 respondents (16.82%) pointed to low socioeconomic status. Only 5 respondents (4.67%) did not know the answer to the question.

Most of the female students participating in the study (69, or 64.49%) indicated that cervical cancer is initially asymptomatic, with 57 (53.27%) students selecting dirty gray, bloody discharge as one of its symptoms. Other symptoms selected as relevant by the respondents were experiencing pain during intercourse (44 respondents; 41.12%), itching (18 respondents; 16.82%), while only 7 women (6.54%) did not know how to answer the question.

According to 92 students (85.98%), CC is associated with HPV infection, while 12 people (11.21%) associate HPV infection with ovarian cancer. Only 3 students (2.80%) linked HPV infection with vulvar cancer.

According to 44 students (41.12%), preventive HPV vaccinations should be given to adolescents aged 12-15 who have not yet become sexually active. Of the participants 28 (26.17%) responded that such vaccination should be performed after the onset of sexual activity, while 19 people (17.76%) believed that such vaccination ought to be performed after the age of 40. Approximately 16 women (14.95%) responded that vaccines should be administered after the first menstruation. According to 56 students (52.34%), HPV vaccinations provide protection against the most common types of HPV, while 30 students

(28.04%) responded that the vaccination is 100% effective against all types of HPV. Meanwhile, 12 students (11.21%) assessed the effectiveness of the vaccine as 100% only for low-oncogenic HPV strains, and 9 respondents (8.41%) were of the belief that preventive vaccinations provide little protection against all types of HPV.

Completing the full cycle of preventive vaccinations against HPV does not exempt a person from further cytological testing, according to 56 of the female students surveyed (52.34%). 28 students (26.17%) believe that after completing the full vaccination cycle, cytological testing is not necessary because the vaccine provides 100% protection. 15 respondents (14.02%) indicated that cytological tests should still be performed, but less frequently, and only 8 students (7.48%) responded that even an incomplete vaccination cycle would be enough to exempt someone from cytological testing.

As shown in the analysis of data from 68 of female students surveyed (63.55%), most women have insufficient information about HPV vaccinations, while 16 students (14.95%) responded that while there is a lot of information, it is incomprehensible to the average woman. According to 14 students (13.08%), any woman who is interested in this issue should have access , while 9 women (8.41%) believe that such information is easily accessible to all women.

A detailed analysis of the data obtained in the research focused on determining the effect of the university degree of the participants on their health awareness in the area of preventive vaccinations designed to prevent CC.

The effect of the students' university degree on their knowledge of and attitude towards preventive vaccinations in the area of cervical cancer prevention is illustrated in Table 1.

An analysis of the responses collected in the context of the effect of the university degree of the respondents on their knowledge of preventive vaccinations for cervical cancer shows that there is no significant statistical relationship between the demographic characteristics studied in the group surveyed. This is confirmed by statistical significance calculations, where the p-value is ≥ 0.05 and equals 0.112, and $\chi^2 = 7.484$.

Table 2 shows the effect of the participants' university degree on their knowledge of preventive vaccinations in the area of preventive vaccination against HPV.

In the study sample, the effect of the students' university degree on their knowledge of preventive vaccinations against HPV shows that there is a statistically significant difference between the characteristics surveyed. The largest number of participants, which is 77 or 71.96%, answered "I have heard of them." Nursing students dominate in this area, with 42 students of them 39.25%, answering in the following manner, in comparison to 35, or 32.71%, of students pursuing a degree in education. A correlation between students' knowledge and their university degree was found, with $p < 0.05$. The p-value is ≤ 0.05 and equals to 0.0001, while $\chi^2 = 17.641$. In addition, the χ^2 test with a binary variable confirmed the existence of significant differences ($p = 0.0264$).

The effect of the university degree of the study sample on their knowledge of preventive vaccinations in the area of HPV transmission is illustrated in Table 3.

Based on the analysis of data concerning the effect of the university degree of the respondents on their knowledge of preventive vaccinations against HPV infections, it can be inferred that there is no significant statistical relationship between the characteristics investigated in the sample. This is confirmed by

TABLE 1. Effect of participants' university degree on their knowledge of preventive vaccinations in the area of cervical cancer prevention.

Item	University degree of the participants				Total	
What methods of cervical cancer prevention do you know?	Nursing		Education		Number of participants	%
Responses*	n	%	n	%	n	%
Pap smear	46	42.99	36	33.64	82	76.64
Gynecological examination	35	32.71	34	31.78	69	64.49
Colposcopy	12	11.21	3	2.80	15	14.02
Ultrasound	20	18.69	10	9.35	30	28.04
Preventive vaccinations against HPV	38	35.51	18	16.82	56	52.34
TOTAL	151	141.12	101	94.39	252	235.51
Chi-square test – χ^2	7.484					
Df – Degrees of freedom	4					
p-value	0.112					
Yeats Chi Test – X	5.645					
Yeats's p-value	0.227					
Standard deviation	14.390					
Pearson index	0.88					
Strength of relationship for 0.001	$X^2 = 7.484 < X^2$ 0.001; 4 = 18.466					
Strength of relationship for 0.01	$X^2 = 7.484 < X^2$ 0.01; 4 = 13.276					
Strength of relationship for 0.05	$X^2 = 7.484 < X^2$ 0.05; 4 = 9.487					

*due to the possibility of marking more than one answer, the total percentages do not sum to 100%

TABLE 2. Effect of participants' university degree on their knowledge of preventive vaccinations in the area of HPV prevention.

Item	University degree of the participants				Total	
What is your level of knowledge regarding preventive vaccinations against HPV?	Nursing		Education		Number of participants	%
Responses*	n	%	n	%	n	%
I have extensive knowledge of preventive vaccinations	10	9.35	0	0.00	10	9.35
I heard about them	42	39.25	35	32.71	77	71.96
I have never heard of them	4	3.74	16	14.95	20	18.69
TOTAL	56	52.34	51	47.66	107	100.00
Chi-square test – χ^2	17.641					
Df – Degrees of freedom	2					
p-value	0.0001					
Yeats Chi Test – X	14,509					
Yeats's p-value	0,001					
Standard deviation	17,046					
Pearson index	0,813					
Strength of relationship for 0.001	$X^2 = 17.641 > X^2$ 0.001; 2 = 13.815					
Strength of relationship for 0.01	$X^2 = 17.641 > X^2$ 0.01; 2 = 9.210					
Strength of relationship for 0.05	$X^2 = 17.641 > X^2$ 0.05; 2 = 5.991					

The distribution of responses in the Nursing and Education groups differs significantly. Additionally, a χ^2 test of the binary variable *Responses to the question: Group 1: I have extensive knowledge of preventive vaccinations + I heard about them; Group 2: I have never heard of them* confirmed the existence of significant differences ($p = 0.0264$).

the statistical significance calculations, where the p-value is ≥ 0.05 and equals 0.5090, while $\chi^2 = 2.316$.

The effect of the university degree of the surveyed students on their knowledge of preventive vaccinations in the area of preventive HPV contraction is illustrated in Table 4.

Based on the collected data regarding the effect of the university degree of the respondents on their knowledge of preventive vaccinations against HPV infections, we observe that there is a significant statistical correlation between the characteristics studied in the sample. The most frequent answer indicated was that such vaccines are only administered to those who want them, as per 56, which is 52.34% of the students. Nursing students were more likely to select this answer with 42, i.e., 39.25% participants sharing this belief, compared to 14, that is 13.08%, of the respondents who pursuing a degree in education. A detailed summary of the responses is presented in the table below. This relationship is confirmed by the summary of calculations for statistical significance, where the p-value is ≤ 0.05 and equals 0.0000, while $\chi^2 = 24.207$. In addition, the χ^2 test with a binary variable confirmed the existence of significant differences (p = 0.038).

Table 5 illustrates the knowledge of preventive vaccinations in the area of preventive vaccination against HPV and their role in relation to the university degree of female students.

The research shows that in the surveyed sample, there is no statically significant relationship with regard to the influence of the university degree level of the students on their knowledge of preventive vaccinations in terms of the role preventive vaccinations play against HPV. This is confirmed by statistical significance coefficients, where the p-value is ≥ 0.05 and equals 0.3660, and $\chi^2 = 2.009$.

TABLE 3. Effect of participants' university degree on their knowledge of preventive vaccinations in the area of HPV transmission.

Item	University degree of the participants				Total	
What do you think is the transmission pathway of HPV?	**Nursing**		**Education**		**Number of participants**	**%**
Responses*	**n**	**%**	**n**	**%**	**n**	**%**
Transmission during sexual intercourse	47	43.93	39	36.45	86	80.37
Airborne transmission	1	0.93	4	3.74	5	4.67
Digestive system transmission	1	0.93	1	0.93	2	1.87
Transmission through contact with contaminated blood	7	6.54	7	6.54	14	13.08
TOTAL	56	52.34	51	47.66	107	100.00
Chi-square test – χ^2	2.316					
Df – Degrees of freedom	3					
p-value	0.5090					
Yeats Chi Test – X	1.524					
Yeats's p-value	0.676					
Standard deviation	18.578					
Pearson index	0.998					
Strength of relationship for 0.001	$X^2 = 2316 < X^2$ 0.001; 3 = 16.266					
Strength of relationship for 0.01	$X^2 = 2.316 < X^2$ 0.01; 3 = 11.344					
Strength of relationship for 0.05	$X^2 = 2.316 < X^2$ 0.05; 3 = 7.814					

TABLE 4. Effect of participants' university degree on their knowledge of preventive vaccinations in the area of preventing HPV contraction.

Item	University degree of the participants				Total	
What do you know about preventive vaccinations designed to prevent HPV contraction?	**Nursing**		**Education**		**Number of participants**	**%**
Responses*	**n**	**%**	**n**	**%**	**n**	**%**
They are mandatory only in the population at risk	5	4.67	14	13.08	19	17.76
They are given only to those willing to get vaccinated	42	39.25	14	13.08	56	52.34
I don't know about them	9	8.41	23	21.50	32	29.91
TOTAL	56	52.34	51	47.66	107	100.00
Chi-square test – χ^2	24.207					
Df – Degrees of freedom	2					
p-value	0.0001					
Yeats Chi Test – X	21.387					
Yeats's p-value	0.001					
Standard deviation	13.288					
Pearson index	-0.412					
Strength of relationship for 0.001	$X^2 = 24.207 > X^2$ 0.001; 2 = 13.815					
Strength of relationship for 0.01	$X^2 = 24.207 > X^2$ 0.01; 2 = 9.210					
Strength of relationship for 0.05	$X^2 = 24.207 > X^2$ 0.05; 2 = 5.991					

The distribution of responses in the Nursing and Education groups differs significantly. Additionally, a χ^2 test of the binary variable *Responses to the question: Group 1: They are mandatory only in the population at risk + I don't know about them; Group 2: They are given only to those willing to get vaccinated* confirmed the existence of significant differences (p = 0.038).

TABLE 5. Effect of participants' university degree on their knowledge of preventive vaccinations in the area of HPV prevention and their role.

Item	University degree of the participants				Total	
What do you consider to be the purpose of preventive vaccinations?	**Nursing**		**Education**		**Number of participants**	**%**
Responses*	**n**	**%**	**n**	**%**	**n**	**%**
Developing immunity	55	51.40	50	46.73	105	98.13
Triggering the onset of illness	0	0.00	1	0.93	1	0.93
Harming the child	1	0.93	0	0.00	1	0.93
TOTAL	56	52.34	51	47.66	107	100.00
Chi-square test – χ^2	2.009					
Df – Degrees of freedom	2					
p-value	0.3660					
Yeats Chi Test – X	0.012					
Yeats's p-value	0.994					
Standard deviation	26.903					
Pearson index	0.999					
Strength of relationship for 0.001	$X^2 = 2.009 < X^2$ 0.001; 2 = 13.815					
Strength of relationship for 0.01	$X^2 = 2.009 < X^2$ 0.01; 2 = 9.210					
Strength of relationship for 0.05	$X^2 = 2.009 < X^2$ 0.05; 2 = 5.991					

DISCUSSION

The main factor contributing to the occurrence of CC is HPV infection, with other factors include age, smoking, sexual activity, and the use of hormonal contraception. CC is difficult to diagnose due to its lack of clinical symptoms. In its early stages, it is asymptomatic, while in advanced stages it causes bloody, dirty-gray discharge, itching, and an unpleasant odor. The diagnosis of CC is confirmed by using ultrasounds, Pap smears, and colposcopies. After diagnostic tests are conducted and abnormalities are identified, a choice of treatment is made from a selection of alternatives such as surgery, radiotherapy, chemotherapy, and combination therapy, which involves the simultaneous use of several methods [3, 4, 10-11].

A review of literature reveals a consensus regarding the notion that screening for CC across the population is the most important public health strategy due to its ability to reduce incidence and, consequently, mortality through identifying pre-invasive and invasive lesions at an early stage, allowing for more effective treatment. However, it is important to note that HPV vaccines do not fully protect women against the disease, so women must continue to undergo cervical cancer screening tests and follow screening guidelines [10, 12].

HPV infection canbe the most common factor causing CC, but is not the only one. There are other demographic and behavioral risk factors that increase the likelihood of developing this type of cancer: low level of education, early onset of sexual activity, multiple sexual partners, long-term use of oral contraceptives, genital warts, lack of routine Pap smears, or previous Pap smears showing abnormality [13].

The analysis conducted as part of the present research shows that some female students of nursing cited Pap smears (46 women, 42.94%) and preventive vaccinations against HPV (38 women, 35.51%) as methods of CC prevention. There are no statistically significant relationships between the characteristics of the sample studied. This is confirmed by calculations of statistical significance, where the p-value is ≥ 0.05 and equals 0.112, while $\chi^2 = 7.484$. The data obtained in the present study regarding female students' knowledge of HPV vaccinations showed that a significant proportion of female students (77, or 71.96%) had at least heard of vaccinations, 42 of those respondents (39.25%) representing medical degrees, while 35 (32.71%) were students from other degrees. This significant difference is confirmed by the statistical significance calculations, where the p-value is ≤ 0.05 and equals 0.0001, while $\chi^2 = 17.641$.

An analysis of the present research on HPV vaccinations showed that 84 students (78.50%) believe that vaccinations are necessary because many deaths in Poland and worldwide are caused by cervical cancer, while 23 (21.50%) women believe that HPV vaccinations are unnecessary for a variety of reasons. There are no significant statistical differences in this regard. This is confirmed by the statistical significance calculations, where the p-value is ≥ 0.05 and equals 0.174, while $\chi^2 = 4.962$.

The results obtained in the study correlate with those presented in the research of other authors.

A study conducted on a sample of 633 female students showed that 281 (45.3%) of them had good knowledge about the HPV vaccine. Furthermore, 320 students (51.6%) knew that the HPV vaccine prevents HPV infection, and more than two-thirds of the respondents, 472 (76.1%), were aware of the fact that HPV vaccine prevents CC. Exactly 361 (58.2%) of the women knew that HPV vaccines should be administered before the first sexual intercourse, and 291 (46.9%) knew that HPV vaccines can be administered to people who have already had sexual intercourse [14].

A study involving 580 students of medical professions showed that 406 (70%) respondents had heard of cervical cancer and and 272 (46.9%) respondents knew it was preventable. Awareness of the incidence of CC being more common in young women was reported by 364 participants (62.8%), while its spreade through transmission was indicated by 246 respondents (42.4%). Among the respondents 280 (48.3%) thought it was a viral infection, 318 respondents (54.8%) assumed it was bacterial infection, and 222 participants (38.3%) indicated that the illness is caused by HPV infection [15].

A study conducted on a sample of 572 medical students at Walailak University found that 43.6% of respondents had heard of HPV infections and 25.3% had heard of the HPV vaccines. More than half of the study participants (52.8%) knew that HPV causes CC. As far as the knowledge of HPV transmission was concerned, approximately 65% of the study participants knew that HPV spreads through sexual contact and causes infection in both men and women, and 52.4% knew that having sex at a younger age increases the risk of HPV infection. Most participants (73.9%) knew that having multiple sexual partners increases the risk of HPV infection. Meanwhile, 49.7% of the participants were aware of the fact that using condoms prevents HPV infection. The most commonly indicated sources of information about HPV infections were: the internet (37.8%), followed by teachers (31.7%), television (22.1%), healthcare professionals (21.9%), brochures (16.7%), posters (14.2%), family members (9.4%), friends (9.6%), and radio (6.0%) [16].

Among the sample of 1,616 female students, less than 50% had heard of HPV infections before the survey. Namely, 788 (48.8%) female students had heard of the HPV virus before. As far as the HPV vaccine is concerned, overall awareness of its existence was quite low (indicated by 21.3%), while the percentage of students who had heard of both HPV and the HPV vaccine was even lower (14.2%) [17].

A study conducted on a sample of 367 Spanish nursing students showed moderate levels of knowledge and a positive attitude towards HPV vaccination. These results emphasize the importance of educating future nurses and educators about HPV and the HPV vaccine in order to effectively prevent sexually transmitted infections [18].

A study carried out among 900 students at the Medical School of the University of São Paulo in Brazil showed that age, education, and university degree influence the knowledge about preventive vaccinations exhibited by the students. Men showed a significantly lower level of knowledge about vaccinations compared to women. Most of the participating men considered women to be more vulnerable to HPV infections and believed that this group should undergo preventive vaccinations [19].

A study involving 307 students from the Faculty of Nursing at Princess Nourah bint Abdulrahman University showed that 73.5% of participants had a low level of knowledge about HPV. Furthermore, over half of the participating nursing students (57%) had a moderate level of knowledge about HPV vaccination. Meanwhile, 66.8% of the nursing students had a low level of knowledge about the HPV vaccine in the context

of its use for women, with an average score of 1.82 ± 1.73. The results of the research would suggest that nursing students had a low level of knowledge about HPV (with an average score of 4.59 ± 3.06) [20].

The knowledge of HPV, as well as the attitude towards it and behaviors related to HPV prevention measures, were the focus of a study involving a group of 1,612 university students in Italy. The results showed that the vast majority of the participants were able to recognize HPV as a sexually transmitted infection (88%) that affects both sexes (90.2%), and indicated that it is responsible for the development of CC (78.4%), although other related cancers were identified by a fewer number of respondents, ranging from a 33.2% response rate for oral cancer to 51% for penile cancer. The effectiveness of HPV vaccines in preventing CC was recognized by two-thirds of the study sample (66%), and only 7.6% were found additionally effective for mouth and penile cancer. Most of the participants indicated that condom use helps prevent transmission of the virus (80%), but only 20% indicated that having fewer sexual partners is also a preventive factor [21].

Low levels of knowledge about HPV (39.0%; n = 202), sexual inactivity (28.8%; n=149), and not being HPV vaccined as part of the national vaccination program were reported by students from 518 medical schools in Turkey. Their preferred sources of knowledge about HPV and the vaccine were: medical school (66.4%; n = 344), the internet (32.6%; n = 169), specialists outside of medical school (12.5%; n = 65), friends (11.0%; n = 57), and family members (5.0%; n = 26). Meanwhile, 17.2% (n = 89) of the students reported not knowing anything about the issue [22].

A study conducted on a group of 312 nursing students in Turkey showed that students' knowledge of HPV was unsatisfactory, and that variables such as gender, year of university, and knowledge of sexually transmitted infections and cervical cancer all affected their level of knowledge about HPV, screening tests, and vaccinations [23].

In a study of 398 students at Education City in Doha, Qatar, most students were aware of the fact that HPV can infect both men and women (67.6% answered correctly), that HPV can cause health problems for both men and women (58.3%), that HPV is transmitted during sexual intercourse (53.8%), and that safe sexual practices (such as condom use) reduce the risk of HPV transmission (54.0%). In contrast, only a small percentage of students knew that the recommended age for getting the HPV vaccine is 11–12 years (8.3%). A total of 89 (22.4%) students were assessed as having uncertain or poor knowledge, while an equal number (89, 22.4%, 95%) were classified as having knowledge about HPV. The remaining 220 students (55.3%) had some limited awareness of HPV [24].

A study conducted in Poland on a group of 995 female students from various universities and faculties showed that the perceived main risk factor for cervical cancer is getting infected with human papillomavirus (HPV) (82% of all respondents; 86% of medical students; 73% of non-medical students). Most female students correctly indicated that cervical cancer screening in Poland is performed using a Pap smear. Only 57% of female students knew that cervical cancer has no specific early symptoms. A total of 78% of all respondents knew that HPV vaccination reduces the risk of cervical cancer. Medical students and sexually active students demonstrated better knowledge about cervical cancer than the rest of the sample [25].

Study Limitations

There are certain limitations to the present study that should be kept in mind when interpreting its results. Firstly, the selected sample may not adequately represent the broader population of nursing and pedagogy students, which limits the ability to generalize the results to the entire group of students in these fields. The study respondents voluntarily and consciously agreed to take part in the study. The analysis conducted for the purpose of the study included only the data gathered from 107 respondents who correctly (and completely) answered the questionnaire items. Due to the lack of a standardized research tool, a self-developed survey questionnaire was used, which has not been validated. To address this limitation, future studies should include a larger sample while utilizing standardized instruments. The study presents an assessment of the knowledge of nursing and pedagogy students about vaccinations in the prevention of cervical cancer. Repeating the study in different contexts will allow us to examine the role of other variables, thus deepening our knowledge of the phenomenon being studied. The study provides important information for the design and implementation of vaccination prevention and control programs dedicated to cervical cancer, taking into account the study context.

CONCLUSIONS

1. Higher education is a factor affecting the level of knowledge of female students regarding prophylaxis and cervical cancer.
2. There were significant differences in the awareness of cervical cancer prevention issues between female students of nursing and education degrees.
3. The study showed that students participating in the study had insufficient knowledge regarding HPV vaccinations.
4. In light of the present results, students of both degrees require additional education about HPV and preventive vaccinations, given the important role they play in preventing cervical cancer.

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