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Original Research

Knowledge, Beliefs and Vaccination Status of Nursing Students about Human Papilloma Virus

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Objective: Human papilloma virus (HPV-Human Papilloma Virus) is a small, non-enveloped double-stranded DNA virus from the Papilo mavirada family. This study was conducted to determine the effect of HPV on the knowledge, beliefs and vaccination status of first and fourth year nursing students.

Method: Data were collected by personal information form, health belief model scale about human papillomavirus infection and vaccination, and human papillomavirus knowledge scale.

Results: The mean perceived benefit score of the students participating in the study was 2.4±0.7 in the first grade and 3.1±0.7 in the fourth grade. The mean perceived sensitivity score was 2.3 ± 0.6 in the first grade and 2.8±0.7 in the fourth grade. The mean perceived severity score was 2.5±0.6 in the first grade and 2.8±0.7 in the fourth grade. The mean perceived barrier score was equal and 2.1±0.4 in all groups. The HPV knowledge scale scores of the students participating in the study consisted of 4 sub-dimensions. The mean score of the general HPV knowledge scale was 4.79±5.6 in the first grade and 16.71±7.9 in the fourth grade. The mean score of HPV screening tests was 3.3±3.7 in the first grade and 9.9±4.0 in the fourth grade. The mean HPV screening test score was 0.4±0.8 in the first grade and 2±1.7 in the fourth grade. The mean score for general HPV vaccination knowledge was 0.7±1.3 in the first grade and 2.8±1.7 in the fourth grade. The mean score for knowledge of HPV vaccination programs was 0.2±0.6 in the first grade and 1.8±1.7 in the fourth grade.

Conclusion: In the fight against cervical cancers, which is an important public health problem, the level of HPV knowledge should be high in order for the nursing profession to fulfil all of its education, counselling, guidance, protection and immunisation functions.

Introduction

Human papillomavirus (HPV-Human Papilloma Virus) is a small, non-enveloped double-stranded DNA virus from the Papilo mavirada family [1]. HPV can cause serious health consequences, including anogenital cancers (cervical, vaginal, vulvar, penile, and anal), oropharyngeal cancers and anogenital warts [2]. The HPV types that pose a risk pathogen for cancers are “16, 18, 31, 33, 45, 52, 58, 35, 59, 56, 51, 39, 68, 73 and 82. HPV 16 and 18 cause warts in 70% of cervical cancer cases. With the contact of HPV on the body surface, it enters the basal cells through micro cracks on the surface and infects the cells, causing epithelial differentiation [3]. HPV is transmitted through close, skin-to-skin contact with an infected person. Transmission is most common during vaginal, penile, anal or oral sex. Rarely, it can be transmitted from mother to baby [4]. HPV causes infection in the basal epilepsy. Although the incidence is very high, most infections resolve spontaneously within one or two years. A very small proportion cause persistent infection and this persistent infection is a serious risk factor for cancer formation [4].

HPV infection is the main cause of cervical cancer. Although it varies from country to country and region to region, it is the fourth most common type of cancer in women worldwide. The incidence of cervical cancer in Turkey is relatively lower than in some countries in Europe or North America [5-7]. Early diagnosis of cervical cancers increases the chance of treatment and survival rate. While the mortality rate of HPV-associated cervical cancers at the age of 50 and over is between 40% and 60%, this rate drops to 25% in individuals diagnosed early in their twenties [9].

HPV infections are often asymptomatic, but they are important because they are the most common viral sexually transmitted infection in adults, cause genital warts, and have a high risk of cancer, especially in type 16 and type 18; they are preventable because they provide recovery with early diagnosis and treatment and protection is possible with vaccination [10]. Regular screening is recommended for early detection of cervical cancer. Screening tests are performed at Family Health Centers , Community Health Centers and Cancer Early Diagnosis, Screening and Education Centers within the scope of primary preventive health care services. Conducting screenings in primary care facilitates reaching a wide audience due to easy accessibility [11]. The main aim of screening tests is to detect cervical cancers at an early stage, treat them with simple and effective methods, and reduce cancer incidence, morbidity and mortality. HPV DNA test and Pap-smear test are used during screening tests. It has not been found significant for individuals with negative screening results to be screened earlier than 5 years. In our country, screening tests are performed every 5 years for women over the age of 30 [11].

However, the HPV vaccine is the most basic application in primary protection to prevent the disease and prevent the spread of the virus [3]. Today there are 3 types of HPV vaccines that protect against different strains of HPV and reduce the risk of cervical cancer [12, 13]. HPV vaccine is recommended for girls and boys over the age of 11 or 12 years, catch-up vaccination is recommended for all people who have not been adequately vaccinated by the age of 26 years, recommended for some adults between the ages of 27 and 45 years with clinical judgment, not recommended for adults over 45 years [4]. Studies have shown that HPV screening and HPV vaccination reduce the incidence and mortality of cervical cancer [14]. In our country, HPV screening tests and vaccination practices are performed by health personnel. Nurses acquire health protection and promotion behaviors during their student years and continue throughout their professional life. Therefore, nursing students should have enough knowledge about cervical cancer and prevention methods regardless of the units they work in after graduation [13-15]. In the literature studies, when the knowledge, attitudes and behaviors of nursing students regarding HPV infection and HPV vaccines were examined, it was found that their knowledge levels were quite low [8,13-16].

This study was conducted to determine the effect of HPV on the knowledge, beliefs and vaccination status of first and fourth year nursing students.

Materials and Methods

Research Design and setting

This study was descriptive, cross-sectional and correlational. The research was conducted between May 2023 and June 2023 with students studying in the department of nursing at a university in the southeastern region of Turkey.

Participants

Gaziantep University, Faculty of Health Sciences, Department of Nursing, 303 students studying in the 1st grade and 227 students studying in the 4th grade were accepted as the population of the study. Power analysis was performed to determine the sample size. The sample size was

determined as 202 nursing students. During the data collection phase, a total of 206 students were reached, 106 of the first-year students and 100 of the fourth-year students. Nursing students who were willing to participate in the study were included in the study. Data were collected online. Informed consent of the participants was obtained on the first page of the online questionnaire.

Data collection tools

Data were collected with personal information form, health belief model scale about human papillomavirus infection and vaccination, and human papillomavirus knowledge scale.

Personal Information Form: This form, organized by the researcher, includes 14 questions about the demographic information of the nurses [13-17].

Health Belief Model Scale on Human Papilloma Virus Infection and Vaccination (HPVV-HBMS): Developed in 2012 by Hae Won Kim. The Turkish version was adapted by Güvenç et al. in 2016. The health belief model scale for HPV and vaccination is a four-point Likert-type scale and is answered as 1 “not at all”, 2 “a little”, 3 “quite”, 4 “very much”. The scale consists of 14 items and four sub-dimensions: perceived benefit (items 1-3), perceived susceptibility (items 4-5), perceived seriousness (items 6-9), and perceived barrier (items 10-14). Higher scores describe stronger perceptions about the dimension. Except for perceived barrier, all subscales are positively associated with vaccination. Cronbach’s alpha reliability coefficient was .78, perceived sensitivity .72, perceived seriousness .78 and perceived barrier .71 in the subscales of the scale [18]. In this study, perceived benefit was .66, perceived sensitivity .66, perceived seriousness .70 and perceived barrier .84.

Human Papilloma Virus Knowledge Scale (HPV- KS): The HPV-Scale was developed by Waller et al. in 2013 to measure individuals’ knowledge of HPV, HPV screening tests, HPV vaccine and vaccination program. It was adapted into Turkish by Demir and Özdemir in 2019. The original scale was 35 items, and it was organized as 33 items in the Turkish adaptation. There are three sub-dimensions with 29 items and an independent sub- dimension with 6 items. These are Factor 1: General HPV knowledge (1-16 items), Factor 2: HPV screening test knowledge (17-22 items), Factor 3: General HPV vaccine knowledge (23-27 items), Factor 4: Knowledge of the current HPV vaccination program (28-33 items). The HPV questionnaire is expected to be answered as “Yes”, “No” and “Don’t know”. Yes answers are totaled as 1 point and no and don’t know answers are totaled as 0 points. The score of the HPV-KS ranges from 0-33 and an increase in score indicates an increase in the level of knowledge about HPV, HPV screening tests and HPV vaccine. The cronbach α value for the 29 items of the original scale was 0.83 and the consistency was reported to be high for this value of the scale [19]. In this study, cronbach α value was calculated as 0.94.

Ethics

Before starting the study, permission was obtained from the Dean’s Office of the Faculty of Health Sciences and Gaziantep University Clinical Research Ethics Committee (2023/15).

Data Analysis

IBM SPSS Statistics for Windows 22.0 was used to analyze the data; descriptive statistics for percentage, frequency, mean, standard deviation, minimum and maximum values were calculated. The conformity of the data to normal distribution was analyzed by Kolmogorov-Smirnov test. A p value below 0.05 was considered statistically significant. Mann Whitney U and Kruskal Wallis tests were performed in nonparametric independent groups.

Results

Of the first-year students participating in the study, 71.6% were female and 28.4% were male, while 70% of the fourth-year students were female and 30% were male. 78.6% of the students had a moderate income. 1.4% had a family history of cervical cancer. 27.3% of first-year students and 78% of fourth-year students had information about HPV. As the source of information, 51% of first-year students stated the internet, 13.7% stated academicians, 10.3% stated movies, magazines and books, and 10.3% stated health personnel. Among the fourth grade students, 51% of them mentioned university courses, 23% academicians, 12% internet as a source. 44% of fourth grade students stated that they received education about HPV. 68.1% of fourth-year students stated that they received education from university courses, 31.8% from academicians. 3.8% of the students received HPV vaccination. 85.4% of the participants did not have information about vaccine prices. 75.7% of the students participating in the study and 51 of the fourth grade students were not informed about when the Pap-smear test would be performed (Table 1).

Features			Classroom			
	First Year Student		Fourth Grader		Total	
	N	%	n	%	n	%
Gender						
Woman	76	71.6	70	70	146	70.8
Male	30	28.4	30	30	60	29.1
Income Status						
Good	4	3.7	6	6	10	4.8
Middle	83	78.3	79	79	162	78.6
Bad	19	17.9	15	15	34	16.5
Number of Siblings						
02-Jan	16	15	7	7	23	11.1
04-Mar	50	47.1	58	58	108	52.4
07-May	29	27.3	29	29	58	28.1
10-Aug	9	8.4	5	5	14	6.7
12-Nov	2	1.8	1	1	3	1.4
Family History of Cervical Cancer						
There is	0	0	3	3	3	1.4
No	106	100	97	97	203	98.5
Knowledge about HPV						
Yes	29	27.3	78	78	107	51.9
No.	77	72.6	22	22	99	48
Information Sources						
University Courses	1	3.4	40	51.2	41	19.9
Internet	15	51.7	10	12.8	25	12.1
Academics	4	13.7	18	23	22	10.6
Movies, Books and Magazines	3	10.3	3	3.8	6	2.9
High School	1	3.4	4	5.1	5	2.4
Health Personnel	3	10.3	2	2.5	5	2.4
Family	2	6.8	2	2.5	4	1.9
Receiving						

Education about HPV						
There is	3	2.8	44	44	47	22.8
No	103	97.1	56	56	159	77.1
Education Resources						
High School	1	33.3			1	2.1
Health Personnel	2	66.6			2	4.2
University Courses			30	68.1	30	63.8
Academics			14	31.8	14	29.7
HPV Vaccination Status						
Yes	2	1.8	6	6	8	3.8
No.	104	98.1	94	94	198	96.1
Knowledge of HPV Vaccine Prices						
Yes	3	2.8	27	27	30	14.5
No.	103	97.1	73	73	176	85.4
Knowledge about when the Pap-Smear Test will be performed						
Yes	1	0.9	49	49	50	24.2
No.	105	99.1	51	51	156	75.7

Table 1. Descriptive Characteristics of the Students Participating in the Study.

Following the sub-dimensions of the health belief model scale regarding HPV infection and vaccination, the mean perceived benefit score of the students participating in the study was 2.4±0.7 in the first grade and 3.1±0.7 in the fourth grade. The mean perceived sensitivity score was 2.3 ± 0.6 in the first grade and 2.8±0.7 in the fourth grade. The mean perceived severity score was 2.5±0.6 in the first grade and 2.8±0.7 in the fourth grade. The mean perceived barrier score was equal and 2.1±0.4 in all groups. The HPV knowledge scale scores of the students participating in the study consisted of 4 sub-dimensions. The mean score of the general HPV knowledge scale was 4.79±5.6 in the first grade and 16.71±7.9 in the fourth grade. The mean score of HPV screening tests was 3.3±3.7 in the first grade and 9.9±4.0 in the fourth grade. The mean HPV screening test score was 0.4±0.8 in the first grade and 2±1.7 in the fourth grade. The mean score for general HPV vaccination knowledge was 0.7±1.3 in the first grade and 2.8±1.7 in the fourth grade. The mean score for knowledge of HPV vaccination programs was 0.2±0.6 in the first grade and 1.8±1.7 in the fourth grade (Table 2).

Mean Scores from the Health Belief Model Scale Subscales Regarding HPV Infection and Vaccination
GRADE 1

GRADE 4
GRADE 1
GRADE 4

Table 2. Distribution of Participants' Scores from the Health Belief Model Scale and HPV Knowledge Scale Subscales Regarding HPV Infection and Vaccination.

When we look at the relationship between HPVV- HBMC sub-dimensions and HPV-KS sub-dimensions of the students participating in the study, a positive moderate relationship was found between HPV-KS sub-dimensions and total score and perceived benefit, perceived sensitivity, perceived seriousness . Those with high HPV-KS scores had higher mean scores in HPVV-HBMS sub-dimensions of perceived benefit, perceived sensitivity, and perceived seriousness. No relationship was found between perceived barrier and HPV-HBMS and its sub-dimensions (Table 3).

		Perceived Barrier	Perceived Benefit	Perceived Responsiveness	Perceived Seriousness
General HPV information	r	-0.057	.465*	.431*	.370*
	p	0.419	0	0	0
HPV Screening Test Information	r	-0.049	.445*	.410*	.373*
	p	0.488	0	0	0
	r	-0.076	.476*	.426*	.383*
General HPV Vaccine Information	p	0.278	0	0	0
	r	-0.098	.458*	.412*	.367*
HPV Vaccine Programs Information	p	0.16	0	0	0
Hpv Knowledge Scale	r	-0.052	.494*	.448*	.405*
Total Score	p	0.46	0	0	0

Table 3. Relationship between HPV Vaccination Health Belief Model Subscales and HPV Knowledge Scale Subscales.

*Correlation is significant at p<0.01 level.

HPVV-HBMS and HPV-KS scores of the students who participated in the study were not normally distributed (p<0.005). There is no significant difference between HPVV-HBMS and HPV-BS and gender groups (p>0.05), there is a significant difference between HPVV-H perceived benefit,

sensitivity, severity, HPV-BS total score and all sub-factors and class groups ($p<0.05$). There is no difference between the perceived barrier in the class groups ($p>0.05$). Fourth grade students had higher mean scores. There is a significant difference ($p<0.05$) between having information about HPV, having received education on this subject, knowing the vaccine prices, knowing when the pap smear test will be performed and HPVV-HBMC perceived benefit, sensitivity, severity, HPVV-HBMC total score and sub-factors, there is no difference between perceived barrier ($p>0.05$). There is no difference between vaccination and HPVV-HBMC and HPV-KS mean scores ($p>0.05$) (Table 4).

Features		HPVV-HBMC					HPV-KS		
	Engel	Benefit	Sensitivity	Seriousness	General HPV Information	HPV Screening Test Information	General HPV Vaccine Information	HPV Vaccine Programs Information	HPV Knowledge ScaleTotal Score
Gender									
Woman	107.7	106.2	105.7	110.5	102.9	105.1	103.8	101.6	103.2
Male	93.1	96.8	98	86.4	104.9	99.4	100.6	107.9	104.1
u	3760.5	3978	4052	3358.5	4292.5	4138.5	4330	4114	4342.5
z	-1.625	-1.048	-0.876	-2.66	-0.227	-0.664	-0.134	-0.762	-0.097
p	0.104	0.294	0.381	0.008	0.821	0.507	0.893	0.446	0.923
Classroom									
First class	104.7	79.4	84.6	89.9	66.4	75.5	70.6	72.6	65.9
Fourth class	102.2	129	123.5	117.9	142.7	133.1	138.3	163.2	143.3
u	5159.5	2749.5	3297	3859	1374	2331.5	1818.5	2025	1319.5
z	-0.311	-6.047	-4.861	-3.411	-9.24	-7.419	-8.507	-8.527	-9.35
p	0.756	0	0	0.001	0	0	0	0	0
Knowledge about HPV									
Yes	101.1	125	121	119.4	141	133.2	138.3	127.8	141.7
No.	106	80.1	84.5	86.2	62.9	71.3	65.8	77.1	62.2
u	5042	2986.5	3421.5	3590.5	1277	2110	1570.5	2692	1208
z	-0.0607	-5.479	-4.551	-4.04	-9.463	-7.966	-9.108	-6.783	-9.606
p	0.544	0	0	0	0	0	0	0	0
Receiving education about HPV									
Yes	102.3	144.5	135.9	133.2	158.7	153.1	151.8	156.4	162.4
No.	103.8	91.3	93.9	94.7	87.1	88.8	89.2	87.8	86
u	3684.5	1807.5	2212.5	2338.5	1138.5	1403	1465.5	1247	967.5
z	-0.148	-5.447	-4.405	-3.941	-7.282	-6.946	-6.609	-7.718	-7.747
p	0.883	0	0	0	0	0	0	0	0
HPV Vaccination Status									
Yes	94	122.5	126.4	130.3	119.5	106.5	115.1	109.1	116.9
No.	103.8	102.7	102.5	102.4	102.8	103.3	103.3	103.2	102.9
u	716.5	639.5	608.5	557	664	768	698.5	747	684.5
z	-0.466	-0.935	-1.152	-1.317	-0.779	-0.155	-0.591	-0.303	-0.653
p	0.641	0.35	0.249	0.188	0.436	0.877	0.555	0.762	0.514
Considering HPV vaccination									
Yes	106.8	137.8	128.9	131	151.8	139	140.5	151	153.4
No.	98.8	112.3	116	113.4	118.4	109.8	113.8	105.7	115.5

I don't know	103.7	89.5	91.4	91.4	83.1	89.8	88.2	87.1	83.4
KW	0.369	22.2	15.5	15.5	45.3	25.1	28	45	45.8
p	0.831	0	0	0	0	0	0	0	0
Knowledge about when the Pap smear test will be performed									
Yes	97.7	150.8	137	129.8	157.7	155	154.8	150	160.9
No.	105.3	88.3	92.7	95	86.1	86.9	87	88.5	85
u	3610	1531.5	2225	2585	1188.5	1323	1333.5	1574.5	1027
z	-0.806	-6.547	-4.738	3.629	-7.439	-7.508	-7.311	-7.058	-7.867
p	0.42	0	0	0	0	0	0	0	0
Knowing the price of the HPV vaccine									
Yes	103.6	145	142.8	139.5	161.9	151.4	149.5	164.8	164.5
No.	103.4	96.4	96.7	97.3	93.5	95.3	95.6	93	93.1
u	2634.5	1394	1458.5	1558.5	888	1202	1258.5	798.5	809.5
z	-0.019	-4.186	-4.062	-3.627	-5.842	-5.092	-4.783	-6.793	-6.093
p	0.985	0	0	0	0	0	0	0	0

Table 4. The Relationship Between Some Characteristics of the Students Participating in the Study and HPVV-HBMC and HPV-KS Scores.

Discussion

HPV is a virus that affects millions of people and is very common among sexually transmitted diseases. Some types of the virus can cause serious health problems, cancers and even death [20]. Protection through vaccination, early diagnosis and treatment services increase survival rates [1]. Including this information in the content of the education received by nurses will ensure HPV awareness in the nursing profession. The fact that nursing students have accurate and up-to-date information in their professional lives enables them to successfully fulfill their duties of protecting and improving public health and provides guidance for service and education planning. In this context, the knowledge of nursing students about HPV is of great importance not only for individual patient care but also for protecting the general health of the society. In this study, we aimed to examine the level of knowledge of future professional candidates, nursing students, about HPV and vaccines. The effects of the education and demographic characteristics of nursing students on their knowledge, beliefs and vaccination characteristics about HPV and literature information were discussed.

An individual’s participation in health screenings depends on the perceived benefit, seriousness, sensitivity and barriers. Individuals participate in health screenings if they have a high belief that they will contribute positively to their health, or they do not participate in health screenings if the barriers to screening are high [21]. HPV screening tests and vaccination are useful in terms of reducing the risk of cancer, providing social protection, cost-effectiveness and raising social awareness [27]. Whether individuals see the risk of HPV transmission as high or low shows their sensitivity on this issue. If individuals understand how HPV is transmitted and the importance of vaccination as a preventive measure, they will take screening and protection seriously [18]. When the HPVV-HBMC sub categories of perceived benefit, sensitivity, seriousness and barrier perceptions of the students participating in the study were examined, it was seen that the mean scores of benefit, sensitivity and seriousness were higher in 4th grade students than 1st grade students. There was an increase in the mean perceived benefit score in the last period of the

nursing education process, and students' health beliefs about HPV vaccination increased with nursing education. The fact that first-year students were at the beginning of their nursing education and that infectious diseases and gynecology and obstetrics courses were given in the second and third grades during their theoretical education may have caused this result. The increase in the perceived susceptibility and perceived seriousness scores of nursing students indicates that the students' beliefs that they are at risk of getting HPV infection and that they may experience serious problems if they get HPV infection. Similarly, the increase in the mean scores of perceived benefit indicates that vaccination is protective. Students' perceptions of barriers to HPV vaccination did not differ between first and fourth grade students. Even though the mean perceived scores in other categories have increased, there are still barriers to vaccination. The perception of barrier cannot be expected to be reduced by education. There may be many reasons preventing vaccination. Turkish society has generally adopted monogamy [22]. Polygamy or sex outside marriage is a sexual taboo. Premarital sex is frowned upon by both sexes [23]. In a study conducted on midwifery and nursing students, 69.7% of female students and 52.7% of male students considered polygamy as a sexual taboo. [24]. In a society where polygamy is considered a sexual taboo, people may not see vaccination as a necessity for protection, even if the perceived benefit, severity and sensitivity are high. In addition, there is no HPV vaccine in the vaccination calendar in Turkey [25]. Those who want to be vaccinated can pay for the vaccine out of pocket. The current price of the vaccine is 276.87 US dollars. It is administered in two or three doses [26]. Most of the nursing students who participated in our study had poor and moderate income levels, and considering the price of the vaccine, the difficulty of out-of-pocket payments emerges. Koç et al. (2023) investigated the knowledge, beliefs and vaccination characteristics of women about cervical cancers and vaccination and listed the fact that the vaccine is new all over the world and the attitude of parents about the necessity of the vaccine, as well as not being covered by the state and not being included in the vaccination program as some of the barriers to vaccination. In the same study, the mean scores of the HPVV-HBMC scale were found to be lower than the 4th grade students in our study [31]. Altıntaş et al. (2022) conducted a study with health sciences faculty students and found that the mean HPVV-HBMC scale scores were higher in fourth year students [13]. In another study, it was found that the knowledge level of nurses was high but not sufficient. [28]. In a study, it was emphasized that the mean scores of perceived barriers were high and perceptions of benefit, sensitivity and seriousness were low in those who did not accept vaccination [29]. The most important factor for HPV vaccination is the absence of barriers and increasing the perception of benefit, sensitivity and seriousness. In this study, it is important in terms of showing that the scores of those who were in the upper grades during the education process were higher, but income level was still an obstacle to vaccination. This shows that nursing education improves the HPVV-HBMC score.

The mean scores of general HPV knowledge, knowledge of screening tests, general vaccine knowledge and vaccine administration knowledge, which are among the HPV-Scale and its sub-factors used in our study, were higher in 4th grade students. While the mean score of the knowledge scale was 4.7±SS in the 1st grade, this rate was 16.7±SS in the last year of nursing education. According to the scale, 33 full points should have been obtained if all questions were answered correctly. Even if the effect of nursing education on HPV knowledge level is very high, it is not sufficient. When we look at the subcategories of HPV-Scale, the mean scores of general HPV knowledge and general vaccination knowledge were higher than HPV screening tests and HPV vaccination program knowledge. It shows that the students who participated in the study gained general knowledge about HPV infection and vaccination, but they did not have detailed and sufficient information such as when and how HPV screening is performed in practice, who is included in the vaccination program, and at what age it is administered. As a finding similar to our study finding, in a study conducted with midwifery students, the mean total scale score was 11.4 and 22.3 in 4th grade students [17]. In Turhan's study, the mean scale score was 9.08 in university students studying in different departments and 16.2 in medical faculty students and the results were similar to our study. The high averages in health faculties can be considered as the positive effect of education [30].

HPV-KS and HPVV-HBMC are used to understand the relationship between awareness of HPV and HPV vaccine acceptance. If there is a positive correlation between the HPV-KS score and the likelihood of receiving the HPV vaccine, we can conclude that knowledge is an important factor in promoting vaccine acceptance. If there is a relationship between perceived usefulness, sensitivity and severity and knowledge, it indicates that knowledge has an impact on health-related perceptions. If the level of knowledge is high but the likelihood of vaccination is low, it is necessary to look at the barriers to accessing the vaccine. When analyzed together with HPVV-HBMC subcategories, there is a correlation between HPVV-HBMC perceptions of benefit, seriousness and sensitivity and HPVV-HB general HPV knowledge, screening knowledge, vaccine knowledge and vaccination program knowledge. The mean scores of HPVV-HBMC perceived benefit, seriousness and sensitivity were also higher in those with higher levels of knowledge about HPV and vaccine. There is no correlation between perception of disability and knowledge scale. Perception of disability is independent of knowledge. The mean score of HPVV-HBMC was found to be higher in those who had knowledge about HPV, knew the vaccine price, and knew the time of pap-smear . The HPVV-KS scale scores of the students who stated that they had information about HPV were also high. In Koyucu's study on midwifery students, the total scale score was found to be 21.9 in the 1^{st} grade and 22.3 in the 4^{th} grade. In Koyucu's study, the scores were quite high and there was no difference between the mean scores between the groups. Socio-demographic characteristics related to midwifery education affected the scale score [17]. In the study of Turhan et al. on university students in which HPV-BS was used, a significant relationship was found between those who had information about cervical cancer and HPV knowledge scale [30].

In the literature studies and in our study, it was found that the mean scores of HPVV-HBMC total and subgroups were high in groups who had heard about HPV, received education, had positive HPV infection in their relatives, and had high awareness. In an online study conducted by Koç et al. (2023), a significant relationship was found between undergraduate education level, having information about HPV, having information about pap-smear and HPVV-HBMC sub-dimensions [31].

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