

## ORIGINAL ARTICLE

## Transferring Information about Human Papillomavirus and Vaccine from Student to Family

Seda Gülbol<sup>1</sup>, Zarife Koçhan<sup>1</sup>, Birsen Karaca Saydam<sup>2\*</sup>

<sup>1</sup>Student, Ege University, Faculty of Health Sciences, Department of Midwifery, İzmir, Turkey

<sup>2</sup>Ege University, Faculty of Health Sciences, Department of Midwifery, İzmir, Turkey

**Correspondence:** [birsen.saydam@ege.edu.tr](mailto:birsen.saydam@ege.edu.tr)

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### ABSTRACT

**OBJECTIVE:** Determining and increasing the awareness of midwifery students and their families about Human Papilloma Virus (HPV) and vaccines (HPVV).

**METHODOLOGY:** The study is of descriptive type. The study was conducted at Ege University Faculty of Health Sciences (EUFHS). The population consisted of all students studying in the Department of Midwifery at EUFHS and their families, and the sample consisted of voluntary participants. Data were collected between September 15 and November 15, 2023. Trainings were conducted face-to-face in faculty classrooms, brochures were distributed, and the questionnaire and Human Papillomavirus Knowledge Scale (HPV-KS) were collected online (Google Forms). The questionnaire and scale were administered twice to the students (before and after the training) and once to their families. Students were asked to educate at least one family member with the brochure. 303 pre-training (PR-T), 179 post-training (PS-T) students and 105 family members participated. Data were analyzed with a t-test, Bonferroni test, and Analysis of Variance in the SPSS-25 package program and significance was evaluated at a 95% confidence interval.

**RESULTS:** The mean HPV-KS score of the students was calculated as PR-T  $10.95 \pm 5.52$  (min:0-max:21.0), PS-T  $15.39 \pm 2.70$  (min:9.0-max:27.0), and the difference between them was found to be statistically significant ( $t=11.806$ ;  $p < 0.05$ ). It was determined that 71.3% of the students who received training provided education to their families about 'HPV and HPVV'.

**CONCLUSION:** As a result of the research, the knowledge level of the students increased and accurate and reliable information was relayed from the students to their families.

**KEYWORDS:** Human Papilloma Virus (HPV), Human Papilloma Virus vaccine (HPVV), midwifery student, information transfer, family education

## **INTRODUCTION**

When the risk factors that increase the disease burden in developing countries are examined, malnutrition, poor water quality and sanitation are followed by unsafe sex. The World Health Organization (WHO) reports that people aged 15-49 years have at least one sexually transmitted infection and that there are approximately 374 million new infections annually. The prevalence of these infections is highest in the 20-24 age group, followed by the 15-19 age group<sup>1-3</sup>.

Human Papillomavirus (HPV) and its variants are known to cause sexually transmitted infections and precancerous lesions, leading to more than 311,000 cervical cancer deaths each year. Approximately 5.0% of newly diagnosed cancers worldwide are due to HPV infection. More than 200 types of HPV have been identified<sup>4,5</sup>. Preventive vaccinations against HPV screening and treatment of precancerous lesions are the most effective ways to prevent cervical cancer and are much more cost-effective than cancer treatment<sup>5</sup>. HPV vaccines (HPVV) have been included in the routine vaccination program in many countries since 2008. HPVV protects HPV-uninfected persons against HPV infection and its risks (genital warts and cancer of the cervix, vagina, vulva and penis)<sup>6</sup>. It is 95% effective against the most common oncogenic types of HPV and 100% protective against precancerous lesions and persistent infections, especially when administered before sexual activity begins<sup>5</sup>.

Our country has no direct statistical information on HPV except local records of private centers. According to national data, it is estimated that approximately 2500 women were diagnosed with cervical cancer in Turkey in 2018, and approximately 1250 women died from cervical cancer. Regarding preventive health practice, HPVV is paid and voluntary in Turkey and is not included in the national vaccination calendar<sup>7,8</sup>. The Turkish Society of Gynecology and Obstetrics, the Turkish Society of Gynecologic Oncology and the Society of Colposcopy and Cervical Pathologies recommend HPVV for both sexes<sup>8-10</sup>. One of the most critical factors affecting vaccination rates is the level of knowledge of parents<sup>9</sup>. Studies have shown that young people and their families have insufficient knowledge about HPV and HPVV<sup>10,11</sup>.

This study was planned to determine the awareness of midwifery students and their families about HPV and HPVV, to enable students to convey information to their families through interactive training given to students, and ultimately to increase the level of knowledge of both students and families.

## METHODOLOGY

Students and their families studying in a university's midwifery department participated in this descriptive study.

### *Study Design*

The study data were collected in the fall semester of the 2023-2024 academic year between September 15 and November 15, 2023. Face-to-face interviews and student training were held in the Faculty of Health Sciences classrooms. After the students were informed about the classroom research, online data collection tools (questionnaire and scale) were sent to their e-mail addresses, and they were asked to respond. The training was carried out in the classrooms using presence and interactive methods.

### *Data collection tools*

The questionnaire form includes information on literature and socio-demographic and descriptive information created by researchers. The Human Papilloma Virus Knowledge Scale (HPV-KS) was developed by Joe Waller in 2013 and adapted into Turkish by Demir Bozkurt and Özdemir (2023). The scale consists of 33 items, and the Cronbach alpha coefficient is 0.96.<sup>14,15</sup>

### *Study Population*

The research focused on all students studying in the Midwifery Department and their families (at least one family member). The population consisted of all students (450 students) enrolled in Ege University, Faculty of Health Sciences, Department of Midwifery. The sample consisted of 303 pre-training (PR-T), 179 post-training (PS-T) students and 105 family members who agreed to participate in the study, approved the consent form, and completed the forms (questionnaire and scale) entirely.

In the research using the "G. Power-3.1.9.2" program, the power of the study was calculated at the 95% confidence level after data collection. According to the power analysis calculated on the difference between measurement times, the alpha was 0.05. Taking the effect size as 1.02, the power of the study was calculated as 99.9% for the relevant sample.

### *Data Collection*

Online consent for participation in the study was obtained from students and their family members. Students were given preliminary information about the study through class representatives. After this, the data were collected in five stages.

In the first stage, students were asked to answer the online survey and pre-training (PR-T) HPV-KS test sent to their institutional e-mail addresses.

In the second stage, as explained in the e-mail sent to the students, they were asked to collect online data from at least one family member. The online forms (questionnaire form and HPV-KS) to be applied to the families were added to the e-mail.

In the third stage (2-4 weeks after the first stage), students were trained in presence, and brochures prepared by researchers on the subject were distributed. The training was separate for each class in the form of PowerPoint presentations about HPV and its vaccines, which were explained with interactive methods. The plain and straightforward information brochure was provided to students on paper and online.

In the fourth stage, after training (2-4 weeks after the third stage), the HPV-KS form (as Google Forms) was sent to students' e-mail addresses and was administered again.

In the fifth stage, Students were asked to convey the education they received to their families (at least one family member) with the help of the brochure and to report this to the researchers through class representatives.

### *Statistical Analysis*

The data were analyzed in the SPSS-25 package program: Descriptive statistical methods, scale Cronbach Alpha values, t-test, Bonferroni test, Analysis of Variance (ANOVA) and the

significance was evaluated at the 95% confidence interval and  $p < 0.05$  level.

***Limitations of the Research***

Following the earthquake disaster in Turkey on February 6, 2023, the data collection phase was carried out online due to university education occurring online; the delay of structured education resulted in the research limitation. It has been accepted for students who don't reside with their family or who have lost their family to provide education on HPV and HPV V to a relative for this study.

***Ethical Disclosures***

Permissions were granted by the Ege University Scientific Research and Publication Commission (25/05/2023, 06/08, 1998) and by the author who adapted the HPV-KS scale into Turkish. Additionally, informed consent was obtained from students and their families.

This research was supported by the 2209-A University Students Research Projects Support Program, carried out by The Scientific and Technological Research Council of Türkiye (TÜBİTAK) Scientist Support Programs Directorate (BİDEB), within the 2nd term of 2022 (Application No: 1919B012223686).

## RESULTS

### *Student Related Results*

When the descriptive findings of the students who contributed to the pre-training questionnaire were examined, it was found that 81.2% were between the ages of 19-22, 30.0% were in the final year of university, 51.5% were living in state dormitories, and 83.2% were in a nuclear family structure. It was determined that 63.4% of the students and 40.9% of their families perceived their financial situation as 'income equal to expenses'. The findings regarding the health status of the students are as follows: 81.8% have never been sexually active, 76.6% didn't smoke, 60.1% didn't consume alcohol, 56.1% received regular health care, and 72.6% had regular childhood vaccinations. When the students' answers to questions about HPV were examined, 56.8% were unaware of the relationship between HPV and cervical cancer, 59.7% had received training on sexual health, and 94.2% wanted to get the HPV vaccine. Regarding HPV, 63.7% had very low knowledge, 5.6% had low knowledge, and 30.7% had moderate knowledge.

From the findings of students who answered the post-training questionnaire, 86.0% were between the ages of 19-22, and 36.3% were in the year before the final year of university.

The mean HPV-KS score of the students' PR-T was  $10.95 \pm 5.53$  (min:0-max:21.0), and the mean HPV-KS score of PS-T was  $15.39 \pm 2.70$  (min:9.0-max:27.0). Independent sample t-test results for the change in HPV-KS mean scores reported a statistically significant increase in the students' information levels ( $t = 11.806$ ;  $p = 0.000$ ). The effect size for the relevant score increase is 1.02 (**Table I**).

The reliability analysis calculated HPV-KS Cronbach's Alpha ( $\alpha$ ) coefficient as 0.903 PR-T and 0.809 PS-T. The HPV-KS Cronbach's Alpha ( $\alpha$ ) coefficient applied to families was 0.933. The differences between the groups (PR-T & PS-T) were reported to be significant in terms of the students' age groups ( $F=14.734$ ;  $p<0.05$ ), grades ( $F=65.984$ ;  $p<0.05$ ), mothers' education level ( $F=3.021$ ;  $p<0.05$ ), place of residence ( $F=3.731$ ;  $p<0.05$ ), receiving regular health services ( $F=8.559$ ;  $p<0.05$ ), alcohol intake ( $F=6.249$ ;  $p<0.05$ ), regular childhood vaccinations ( $F=7.229$ ;  $p<0.05$ ) and knowing the relationship between HPV and cervical cancer ( $F=132.476$ ;  $p<0.05$ ) (**Table II**).

### *Family Members Related Results*

When the descriptive information of the families is observed, 51.4% of the respondents were the student's mother, 7.6% were the father, 18.1% were the sibling, and 22.9% were the relative. 36.2% of the respondents are between the ages of 41-50, 87.6% are women, 37.1% are university graduates, 76.2% have children, 85.7% are in a 'nuclear family' structure, and 87.6% have health insurance.

While it was declared that 61.9% of family members care about their health, only 58.1% of them had regular health checks, 66.7% had regular vaccinations (childhood, COVID, influenza, etc.), 59.0% didn't smoke, and 76.2% didn't consume alcohol.

42.9% of the family members first had sexual intercourse between the ages of 21-25, 39.0% didn't use any birth control method, 21.0% of those who used birth control used condoms, and 27.6% had regular gynecological examinations. 98.1% of the participants didn't have any sexually transmitted diseases, 67.6% didn't have any gynecological disease, and 16.2% had experienced a gynecological infection (vaginitis, candida albicans, etc.).

51.4% of the families hadn't heard of HPV, 50.5% didn't know the relationship between HPV and cervical cancer, 49.5% needed education about HPV, and 89.5% didn't receive the HPV vaccine.

When descriptive characteristics of family members were compared with mean HPV-KS scores, it was concluded that place of residence ( $F=3.943$ ;  $p<0.05$ ), smoking ( $F=3.761$ ;  $p<0.05$ ), alcohol intake ( $t=3.335$ ;  $p<0.05$ ), hearing about HPV ( $F=14.069$ ;  $p<0.05$ ), knowing

the relationship between HPV and cervical cancer ( $F=9.916$ ;  $p<0.05$ ) and hearing about HPV ( $t=4.229$ ;  $p<0.05$ ) were statistically significant (**Table III**).

It was deduced that 71.3% of the students who received training provided education to their families regarding 'HPV and HPV' with the distributed brochure.

**Table I: Distribution of students' mean HPV-KS scores before and after training**

	Group	n	$\bar{X}$	SS	t test value	p-value	Effect size
Mean	Pre-training (PR-T)	303	10.95	5.25	11.806	0.000*	1.02
HPV-KS score	Post-training (PS-T)	179	15.39	2.70			

**Table II: Comparison of students' socio-demographic and descriptive characteristics and mean HPV-KS score**

Features	HPV-KS X̄±SD	F value	p-value	Bonferroni
<b>Age group</b>				
18 years and under	6.17±5.50	F = 14.734	0.000*	1<2,3
Between 19-22 years old	11.31±5.24			
23 years and above	12.93±5.53			
<b>Class</b>				
1st Class	5.38±5.14	F = 65.984	0.000*	1<2,3,4; 2<3.4 ; 3<4
2. Class	8.90±4.61			
3rd Class	12.95±3.64			
4th grade	14.76±3.53			
<b>Mother's education level</b>				
Primary school and below	10.21±5.57	F= 3.021	0.030*	1<3
Secondary school	10.74±5.49			
High school	12.39±5.36			
University and above	12.62±4.70			
<b>Place of residence at the time of the survey</b>				
At home with his family	10.84±5.32	F = 3.731	0.006*	1<2
At home with friends	13.82±4.40			
At home with relatives	12.25±7.50			
In the state dormitory	10.16±5.60			
<b>Receiving regular health care</b>				
Yes	12.05±5.08	F = 8.559	0.000*	2<1
Irregular	9.35±5.70			
No	10.65±6.12			
<b>Alcohol use status</b>				
Users	11.80±4.67	F = 6.249	0.002*	3<2
Social drinkers	12.39±4.94			
Non-users	10.05±5.75			
<b>Regular vaccination status</b>				
Yes	11.67±5.36	F = 7.229	0.001	1>2,3
Irregular	9.19±5.47			
No	8.55±5.87			
<b>Knowing the relationship between HPV and CxCA</b>				
I know	14.39±4.01	F=132.476	0.000*	3<1,2; 2<1
I partially know	10.75±3.90			
I don't know	4.52±4.30			

**Table III: Comparison of some descriptive characteristics of families and mean HPV-KS scores**

Features	HPV-KS X̄±SD	F value	p-value	Bonferroni
Longest lived place				
Town	4.33±7.11	F = 3.943	0.010*	4>1.3
District	7.81±7.35			
Province/city	6.39±6.64			
Metropolitan/metropolis	12.14±8.62			
Smoking status				
Yes	7.10±6.90	F = 3.761	0.027*	2>3
Rarely	13.17±8.09			
No	6.87±7.51			
Alcohol use status				
Occasional social drinker	11.88±8.08	t= 3.335	0.001*	** -
No	6.34±6.98			
Hearing about HPV				
Yes	11.24±7.16	F = 14.069	0.000*	1>2
No	3.93±6.07			
I'm not sure	5.80±7.89			
Knowledge of the relationship between HPV and CxCA				
I know	11.36±8.49	F = 9.916	0.000*	1,2>3
Partially	10.23±6.90			
I don't know	4.66±6.41			
Hearing about the HPV vaccine				
Yes	9.86±7.51	t= 4.229	0.000*	-
No	4.08±6.34			

\*p<0.05



## DISCUSSION

This study was conducted to increase individual awareness of a preventable viral problem that is thought to pose a future clinical risk. Cancer is a significant health problem, and there are rare types of cancer that are less likely to develop with the strengthening of preventive health services. Many types of cancer caused by HPV can be reduced with conscious, simple measures. This is very valuable for the disease burden and treatment costs of countries and individuals' material and moral health.

The relationship between HPV infection and gynecologic cancers is a known fact. Prophylactic HPV vaccines protect uninfected people against HPV infection and its risks. WHO has set targets and strategies to eliminate cervical cancer by 2030. Vaccinating all children and informing families is particularly important<sup>5,6</sup>. The midwifery profession serves women and has a responsibility in this regard. Midwives can contribute to preventive health services by providing accurate information about HPV and vaccines to the community. The fact that the highest proportion of the students participating in the study was in the last two years of university education (30% were in the final year and 36.6% were one year before the final year) suggests that the study provided students with the opportunity to gain experience. In his thesis study, Yılmaz (2007) found that midwives working in primary health care provided more health education than health officers and nurses<sup>10,16</sup>. Counseling by trained health professionals can potentially improve the management of HPV<sup>11,17</sup>. Courses that included HPV in the curriculum and internships in different clinics positively affected the average HPV-CS score of students as they progressed through their university careers.

High levels of preventive health care require women to have high levels of health literacy. Educating women to promote healthy societies is the best investment for the future. An informed mother raises informed children and helps create a healthy generation. **Gökoğlu (2021)**<sup>18</sup> emphasizes that maternal education is effective in healthy lifestyle behaviors. In his thesis, Söylemez (2023) found a significant and positive relationship between child health outcomes and parental health literacy<sup>19</sup>. Our results support that students with educated mothers have significantly higher HPV-CS scores.

Sexually transmitted diseases are taboo in our culture. This situation negatively affects the dissemination of HPV information. In our study, the high average HPV-KS score of students living with friends indicates that taboo topics are discussed among young people. Studies conducted with university students found that the mean HPV-CS score was similarly higher in young people living in student dormitories<sup>10,11</sup>. It is thought that the information provided by the students in our study will have benefits, such as discussing a taboo subject within the family and correcting incomplete and incorrect information.

In our study, the mean HPV-CS scores of students who did not consume alcohol were lower. **Yılmaz Özdemir et al. (2023)**<sup>20</sup> also found that the mean HPV-CS scores of students who did not consume alcohol were lower in their study with medical students. Individuals without harmful habits are expected to be highly aware of healthy lifestyle behaviors and awareness, but our results showed the opposite. People who drink alcohol or have other dangerous habits are more likely to encounter risky situations than others, and their awareness is thought to stem from the need to take precautions. Individuals with high health awareness who value health have regular health checks, do not neglect vaccinations, follow medical innovations, and this is reflected in their behavior and attitudes. **Sommer et al. (2018)**<sup>21</sup> found that one of the reasons why individuals do not have periodic health checks is a lack of awareness. In this sense, it is expected that students who receive regular health services, have regular vaccinations and know the relationship between HPV and cervical cancer will have high scale scores.

Before the age of 20, it is known that women who have had more than one sexual partner are



at high risk because the cervical tissue has not yet completed its development and, therefore, cannot form an adequate immune response against HPV<sup>22</sup>. In our study, 42.9% of the family members had their first sexual intercourse between the ages of 21 and 25. Individuals can reduce the risk of HPV infection by limiting the number of sexual partners and using condoms correctly<sup>23</sup>. In our study, it is a positive situation that family members had their first sexual intercourse at the ideal age, were monogamous, and 21.0% of them used condoms. In addition, the majority of family members were non-smokers and non-drinkers (59.0% non-smokers, 76.2% non-drinkers), had regular health check-ups (58.1%) and were vaccinated (66.7%). Although these rates are at a good level in the population participating in our study, habits such as not smoking, having regular vaccinations and not neglecting health checks are not at the desired level in our society<sup>24</sup>. Research has been conducted to help individuals acquire, maintain, or increase their healthy lifestyle behaviors. **Serim and Arıkan** (2021)<sup>25</sup> mention the importance of impulses and willpower in determining preferences and behaviors with their article's behavioral economics approach model. They suggest different, memorable and engaging activities to overcome individuals' lack of knowledge. Our study is a good example of individuals gaining or maintaining awareness through a different method (knowledge transfer from students).

Regular gynecologic examination is the only way to diagnose premalignant and malignant conditions early. Cervical cancer is the most important disease that can be diagnosed and treated early with regular gynecologic examination<sup>26</sup>. In our study, 27.6% of family members had regular gynecological examinations, which reflects the attitude in Turkey. In countries where sexuality is taboo, women are ashamed of gynecological examinations. In a study conducted with highly educated women, only 22.6% reported having regular gynecological examinations. In another study, it was found that women usually had gynecological examinations due to pregnancy and childbirth (57.89%) and preferred a female doctor (94.8%), while 25.33% were embarrassed<sup>27</sup>. In another study, it was found that exposure to the genital area during gynecological examination ( $p < 0.001$ ) was a behavior that increased shame<sup>28</sup>. In our culture, gynecological examinations are postponed or not considered by women because of the importance of privacy.

The level of knowledge about HPV and its vaccine among the family members who participated in our study was at a level suggesting the necessity of HPV education (51.4% had not heard of HPV, 50.5% did not know the relationship between HPV and cervical cancer and 49.5% needed education about HPV). In a study conducted with HPV-positive patients, 28.9% of the participants had no information about HPV, while 43.1% had no information about HPV<sup>29</sup>. In another study, only 3.4% had information about HPV<sup>30</sup>. In a study conducted with parents of girls aged 10-18 years, 60.7% of the participants wanted to learn about HPV and HPV<sup>31</sup>. In the study conducted by **Mutlu et al.** (2021)<sup>32</sup>, only 11.9% of the participants received HPV vaccination. As our research results show, the level of knowledge about HPV and HPV is low, and the reasons for this include the fact that people think that HPV is only sexually transmitted and can only cause disease in women; HPV is not included in the national vaccination program, the vaccine is expensive, and vaccines are only for women.

The limitation of this study is that it was conducted only with a group of students enrolled at Ege University and their families.

## CONCLUSION

As a result of the study, the knowledge level of the students increased, and 71.3% of the students who received training informed their families about "HPV and HPVV" through brochures. The number of families who received training (127) was higher than those who participated in the study (105).

It is recommended that the study be conducted with larger populations, joint projects be carried out with non-governmental organizations, and action plans be developed to mobilize support systems.

**Ethical permission:** Ege University, Izmir, Turkey, ERC letter No. (25/05/2023, 06/08, 1998). Informed consent was obtained from students and their families.

**Conflict of interest:** There is no conflict of interest between the authors.

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**Data Sharing Statement:** The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publicly.

## AUTHOR CONTRIBUTION

Gulbol S: Design, data collection, processing, analysis & interpretation, literature search

Kochan Z: Design, Data collection, processing, literature search

Saydam BK: Concept, design, analysis & interpretation, literature search

## Abbreviations used in the article:

**HPV:** Human Papilloma Virus

**HPVV:** Human Papilloma Virus Vaccine

**HPV-KS:** Human Papillomavirus Knowledge Scale

**PR-T:** Pre-training

**PS-T:** Post-training

**ANOVA:** Analysis of Variance

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